



ADVANCE MITIGATION PROGRAM
Sierra Nevada and Sierra Nevada Foothills
Ecoregion Sections Within Caltrans District 10
Regional Advance Mitigation
Needs Assessment

Version 1.0

Establishing Caltrans' Need for Advance Mitigation
for Caltrans District 10
forecast fiscal years 2023/24 to 2032/33

California Department of Transportation – District 10

July 2026

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LIST OF ACRONYMS

Acronym	Definition
ACE	Areas of Conservation Emphasis
AMA	Advance Mitigation Account
AMP	Advance Mitigation Program
AMP Guidelines	<i>Advance Mitigation Program Final Formal Guidelines</i>
Basin Plan	Water Quality Control Plan
BEI	Bank Enabling Instrument
BIOS	Biogeographic Information and Observation System
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
CNDDDB	California Natural Diversity Database
CNRA	California Natural Resources Agency
Corps	U.S. Army Corps of Engineers
CTC	California Transportation Commission
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
EPA	U.S. Environmental Protection Agency
ESU	evolutionarily significant unit
FESA	federal Endangered Species Act
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-6	six-digit hydrologic unit code
HUC-8	eight-digit hydrologic unit code
HUC-12	12-digit hydrologic unit code
Master Process Agreement	<i>Master Process Agreement for Planning and Developing Advance Mitigation throughout California for the California Department of Transportation Advance Mitigation Program</i>
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
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
RAMNA	Regional Advance Mitigation Needs Assessment
RCIS	regional conservation investment strategy
RipZET	Riparian Zone Estimator Tool
RTPA	regional transportation planning agency
RWQCB	Regional Water Quality Control Board
SAMNA	Statewide Advance Mitigation Needs Assessment
SAMNA Report	<i>Statewide Advance Mitigation Needs Assessment Report Second Quarter 2021/22 Fiscal Year</i>
SAMNA Reporting Tool	Statewide Advance Mitigation Needs Assessment Reporting Tool
SFEI	San Francisco Estuary Institute
SHC	Streets and Highways Code
SHOPP	State Highway Operation and Protection Program
SHOPP Ten-Year Book	<i>State Highway Operation & Protection Program Ten-Year Project Book 2023/24–2032/33</i>
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	Forest Service
USGS	U.S. Geological Survey
Water Boards	State Water Resources Control Board and Regional Water Quality Control Board
WOTUS	waters of the U.S.

EXECUTIVE SUMMARY

This *Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections within Caltrans District 10 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 (“FHWA”), other transportation agencies, Native American tribes, interested parties, and the public. Caltrans District 10 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

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 (“Corps”) Los Angeles, Sacramento, and San Francisco districts; U.S. Environmental Protection Agency (“EPA”); U.S. Fish and Wildlife Service (“FWS”); National Marine Fisheries Service (“NMFS”); 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). 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).

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.

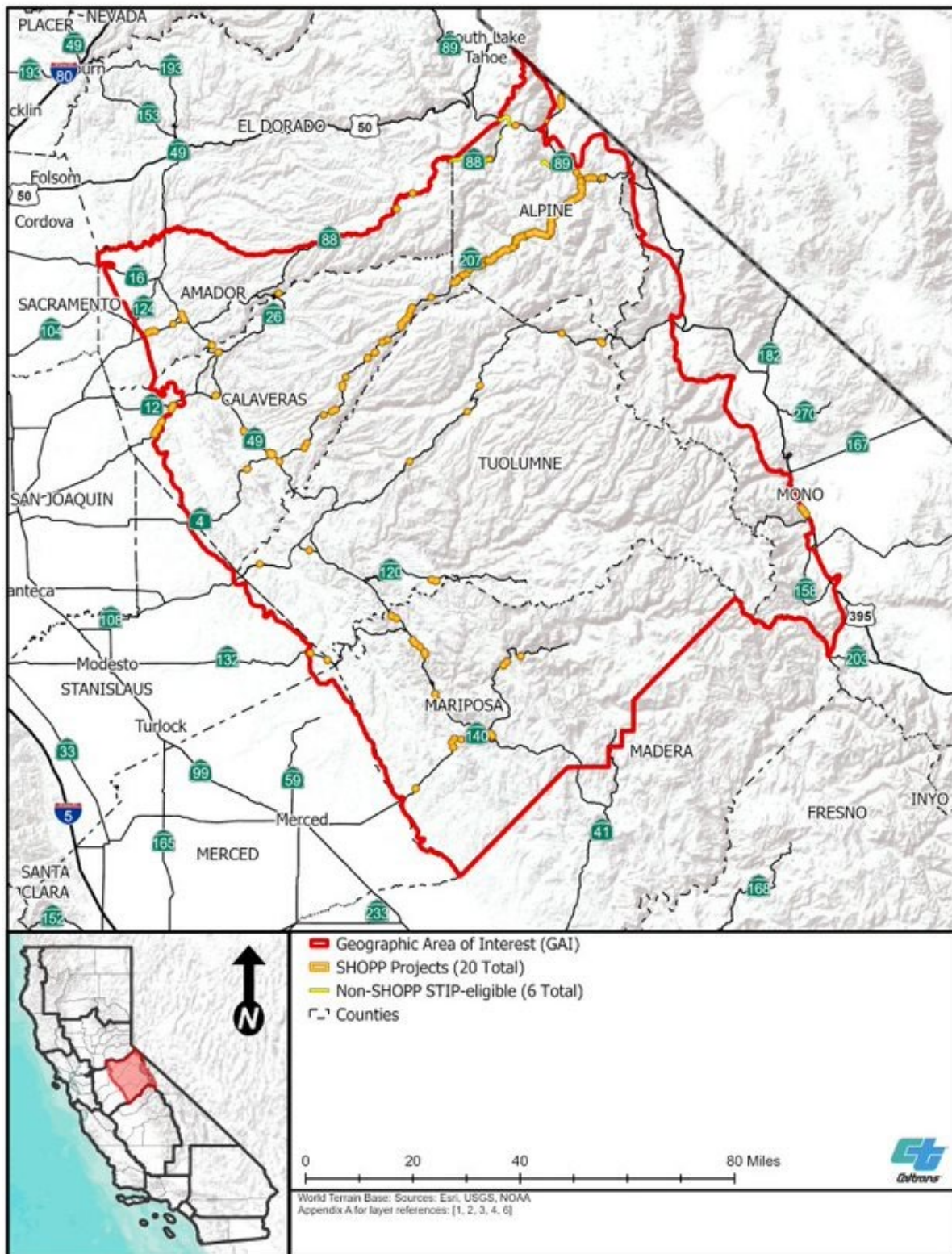
Through the RAMNA's review process, the conservation goals and objectives provided in the RAMNA were vetted with the natural resource regulatory agencies. Caltrans thinks incorporating natural resource regulatory agency goals and objectives into advance mitigation project scopes improves the chances 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 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 2023/24 through 2032/33, a planning period consistent with Caltrans:

- Long-term transportation plans conceptualized in the *State Highway Operation & Protection Program Ten-Year Project Book 2023/24—2032/33* (“SHOPP Ten-Year Book”; Caltrans 2023a). 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 Assessment⁶ Report Second Quarter 2021/22 Fiscal Year* (“SAMNA Report”; Caltrans 2023b). 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 Crowley Lake (eight-digit hydrological unit code [“HUC-8”] 18090102), East Walker (HUC-8 16050301), Fresno River (HUC-8 18040007), Lake Tahoe (HUC-8 16050101), Middle San Joaquin-Lower Chowchilla (HUC-8 18040001), Mono Lake (HUC-8 18090101), Rock Creek-French Camp Slough (HUC-8 18040051), South Fork American (HUC-8 18020129), Upper Calaveras (HUC-8 18040011), Upper Carson (HUC-8 16050201), Upper Consumnes (HUC-8 18040013), Upper Merced (HUC-8 18040008), Upper Mokelumne (HUC-8 18040012), Upper San Joaquin (HUC-8 18040006), Upper Stanislaus (HUC-8 18040010), Upper Tuolumne (HUC-8 18040009), and West Walker (HUC-8 16050302) subbasins. GAIs are established at an ecoregion or HUC-8 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 10 selected the GAI because SAMNA model results for fiscal years 2021/22 through 2030/31 (Caltrans 2023b) 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 hundreds of species’ habitats, to further focus the planning effort, Caltrans District 10 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. The terrestrial “species of mitigation need” are the federally listed as threatened and California species of special concern California red-legged frog (*Rana draytonii*), federally and state threatened central California Distinct Population Segment (“DPS”) of California tiger salamander (*Ambystoma californiense*), California species of special concern south Sierra DPS of foothill yellow-legged frog (*Rana boylei*), federally listed as endangered and state listed as threatened Sierra Nevada yellow-legged frog (*Rana sierrae*), proposed for

⁶ The Statewide Advance Mitigation Needs Assessment Reporting Tool (“SAMNA Reporting Tool”) is a geographic information system (“GIS”) overlay model developed by Caltrans to support advance mitigation planning (Caltrans 2018).

listing as federally threatened and California species of special concern western spadefoot (*Spea hammondi*), and proposed for federal listing as threatened California spotted owl (*Strix occidentalis occidentalis*). The species of mitigation need co-occur with other protected plant, invertebrate, amphibian, reptile, bird, and mammal species. By procuring or establishing advance mitigation credits for one or more of the species of mitigation need, Caltrans District 10 will also benefit multiple special-status species that occur and use the same habitats. Fish species of mitigation need identified for this RAMNA include the federally threatened Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*), federally threatened Paiute cutthroat trout (*Oncorhynchus clarkii seleniris*), and federally threatened steelhead – Central Valley DPS (*Oncorhynchus mykiss*). Compensatory mitigation for aquatic resources⁷ and riparian habitat were also identified as both historical transportation project compensatory mitigation needs and anticipated future transportation project compensatory mitigation needs in the GAI.

While the GAI is predominantly within Caltrans District 10, to be inclusive of a complete subecoregion, a portion of the GAI extends into Caltrans District 9 (Figure ES-1).

ES.2 Environmental Setting

Information on the GAI's environmental setting is provided in Chapter 2, *Environmental Setting*, 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 Biogeographic Information and Observation System ("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 4.1 million acres within the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections, which are overlapped by portions of 17 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; and comprehensive, conservation, 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 153 documents that may be relevant to advance mitigation planning and mitigation project delivery: 36 state and federal laws, guidelines, and regulations; 17 statewide and regional resource management plans; 42 plans and permits as well as other documents focused on species of mitigation need; 22 state and federal agency, Native American tribal, and local government land management plans; 14 water

⁷ For the purposes of this document, aquatic resources include all fish, wetlands, and non-wetland waters regulated by CDFW, FWS, California Coastal Commission, State Water Resources Control Board and Regional Water Quality Control Boards, Corps, EPA, and NMFS.

resources plans and documents; 17 county, city, and local government general plans; and 5 nongovernmental organization conservation and management documents. A summary and links to these documents can be found in Chapter 3, *Relevant Plans, Policies, and Regulations*.

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, *Existing Mitigation Opportunities*, presents readily available information regarding existing mitigation opportunities for the GAI. In brief, Caltrans identified no NCCPs or HCPs for which Caltrans is a participant or may be eligible to participate, 24 pending or active conservation and mitigation banks, one in-lieu fee program, no in progress or approved RCISs, 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 objectives⁸ as well as 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 project⁹ 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.

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 State Highway System (“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.

Chapter 5, *Modeled Estimated Impacts*, provides transportation project impact estimates for fiscal years 2023/24 to 2032/33. Within the GAI, 22 SHOPP transportation projects and 6 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 wetlands, non-wetland waters, vernal pools, and riparian habitat from SHOPP transportation projects included in the SAMNA are summarized in Tables ES-1 through ES-4. Since natural resource regulatory agencies routinely place wetland, non-wetland water, and riparian habitat conditions on transportation projects, it is likely that Caltrans transportation project schedules would benefit from available credits for these resources. Similarly, impact estimates for threatened and endangered fish species of mitigation need and terrestrial species of mitigation need are summarized in Tables ES-5 and ES-6, respectively. When Caltrans scopes advance mitigation projects to establish mitigation, it 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.

Table ES-1. 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	Total ^b
Middle San Joaquin-Lower Chowchilla	18040001	1	<0.1	0.0	<0.1
Upper Calaveras California	18040011	1	0.1	0.1	0.3
Upper Carson	16050201	1	<0.1	<0.1	<0.1
Upper Merced	18040008	1	0.0	<0.1	<0.1
Upper Mokelumne	18040012	2	0.5	0.2	0.7
Upper Stanislaus	18040010	1	<0.1	0.0	<0.1
Upper Tuolumne	18040009	2	0.1	0.1	0.2
Total^{b,c} Not applicable		8	0.8	0.4	1.2

^a The SAMNA forecasts impacts on wetlands for 7 of the 17 HUC-8s in the GAI.

^b Totals may be different due to rounding.

^c Totals may not reflect numbers presented in the rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect wetlands.

Table ES-2. 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	Canal/ Ditch	Stream/ River	Lake/ Pond	Total ^b
Middle San Joaquin-Lower Chowchilla	18040001	1	0.0	<0.1	0.0	<0.1
Mono Lake	18090101	1	0.0	0.1	0.0	0.1
Upper Calaveras California	18040011	4	0.0	1.5	0.0	1.5
Upper Carson	16050201	2	0.0	0.2	0.0	0.2
Upper Merced	18040008	2	0.0	0.9	0.0	0.9
Upper Mokelumne	18040012	5	0.1	3.4	0.0	3.5
Upper Stanislaus	18040010	6	<0.1	1.1	0.5	1.6
Upper Tuolumne	18040009	5	<0.1	0.4	0.0	0.5
South Fork American	18020129	1	0.0	<0.1	0.0	<0.1
Total^{b,c}	Not applicable	18	0.1	7.8	0.5	8.5

^a The SAMNA forecasts impacts for 9 of the 17 HUC-8s in the GAI.

^b Totals may be different due to rounding.

^c Totals may not reflect numbers presented in the rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect non-wetland waters.

Table ES-3. 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	1	0.9	0.9	0.9
Upper Stanislaus	18040010	1	0.1	0.1	0.1
Upper Tuolumne	18040009	2	0.8	0.0	0.8
Total^{b,c} Not applicable		3	1.8	0.9	1.8

^a The SAMNA forecasts impacts for 3 of the 17 HUC-8s in the GAI.

^b Totals may be different due to rounding.

^c Totals may not reflect numbers presented in the rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect non-wetland waters.

Table ES-4. Summary of Estimated SHOPP Project Impacts on Areas of Potential Riparian Function in the GAI (acres)^a

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Slope-based Estimate ^b	Vegetation Process- based Estimate ^b
Middle San Joaquin-Lower Chowchilla	18040001	1	0.01	0.20
Mono Lake	18090101	1	0.00	0.10
Upper Calaveras California	18040011	6	0.05	18.62
Upper Carson	16050201	3	0.13	0.74
Upper Merced	18040008	2	1.30	2.44
Upper Mokelumne	18040012	7	1.66	27.91
Upper Stanislaus	18040010	7	0.54	5.57
Upper Tuolumne	18040009	5	0.15	16.21
South Fork American	18020129	1	<0.01	0.10
Total^{c,d} Not applicable		19	3.83	71.89

^a Impacts were estimated for 9 of the 17 HUC-8s in the GAI.

^b Vegetation polygon features used for the analysis are consistent with the SAMNA.

^c Totals may be different due to rounding.

^d Totals may not reflect numbers presented in the rows above. Some SHOPP transportation projects cross more than one sub-basin; some are not forecast to affect riparian habitat.

Table ES-5. Summary of Estimated SHOPP Impacts on Threatened and Endangered Fish Habitat in the GAI (acres)^{a,b,c}

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Lahontan Cutthroat Trout	Longfin Smelt	Paiute Cutthroat Trout	Total ^c
Upper Carson	16050201	2	0.2	0.0	0.2	0.2
Upper Mokelumne	18040012	5	3.3	3.3	0.0	3.3
Upper Stanislaus	18040010	6	1.6	0.0	0.0	1.6
Upper Tuolumne	18040009	4	0.0	0.0	0.4	0.4
Total^d	Not applicable	13	5.2	3.3	0.7	5.6

^a Threatened and endangered fish species habitat impacts are forecast by the SAMNA Reporting Tool.

^b The SAMNA forecasts impacts on wetlands for 4 of the 17 HUC-8s in the GAI.

^c 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.

^d Totals may not reflect numbers presented in the rows above. Some SHOPP transportation projects cross more than one sub-basin; some special-status species occur within more than one HUC-8.

Table ES-6. Summary of Estimated SHOPP Impacts on Terrestrial Species of Mitigation Need in the GAI

Ecoregion Section	California Red-legged Frog Habitat: Number of Caltrans SHOPP Projects ^a	California Red-legged Frog: Estimated Habitat Impact (acres)	California Tiger Salamander Habitat: Number of Caltrans SHOPP Projects ^a	California Tiger Salamander: Estimated Habitat Impact (acres)	Foothill Yellow-legged Frog Habitat: Number of Caltrans SHOPP Projects ^a	Foothill Yellow-legged Frog: Estimated Habitat Impact (acres)	Sierra Nevada Yellow-legged Frog Habitat: Number of Caltrans SHOPP Projects ^a	Sierra Nevada Yellow-legged Frog: Estimated Habitat Impact (acres)	Western Spadefoot Habitat: Number of Caltrans SHOPP Projects ^a	Western Spadefoot: Estimated Habitat Impact (acres)	California Spotted Owl Habitat: Number of Caltrans SHOPP Projects ^a	California Spotted Owl: Estimated Habitat Impact (acres)	Total
Sierra Nevada	7	59.3	1	0.6	6	61.8	10	25.7	0	0.0	8	45.1	64.8
Sierra Nevada Foothills	13	120.6	13	109.6	13	120.3	1	0.5	6	4.0	12	37.9	120.8
Total^b	16	179.9	14	110.1	15	182.1	11	26.3	6	4.0	17	83.0	185.6

Source: Caltrans (2023c)

^a Transportation projects are listed in Appendix B *Transportation Projects Planned for the GAI during the Planning Period*.

^b Totals may not reflect numbers presented in the rows above. Some SHOPP transportation projects cross more than one ecoregion section.

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 2025/26), Caltrans is 2 years into the SHOPP Ten-Year Book planning period. Therefore, the time period under consideration is fiscal years 2023/24 to 2032/33. At this time, Caltrans District 10's priorities are to develop projects that upgrade its 495 lane miles of roadways from fair to good condition.

Chapter 6, *Benefiting Transportation Project Considerations*, provides a temporal analysis of Caltrans needs organized by aquatic resources, riparian habitat, and species of mitigation need. Prior to proposing advance mitigation projects, Caltrans District 10 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.

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, *Assessment of Authorized Activities*.

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 that have the authority to approve wildlife resource-related credit establishment and its 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 as well as 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 protecting population health of species of mitigation need
- Providing multi-species and multi-resource benefits

Objectives and sub-objectives are provided under each of the above goals in Chapter 7, *Wildlife Resources Conservation Goals and Objectives*, 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 its 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/or enhancing the chemical, physical, and biological integrity of wetlands and non-wetland waters
- Restoring or enhancing and expanding habitat for fish species of mitigation need
- Supporting resiliency of aquatic resources to climate change and sea-level rise
- Providing multi-resource benefits

Sub-objectives are included for each goal in Chapter 8, *Aquatic Resources Conservation Goals and Objectives*, 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,

Assessment of Authorized Activities. At this time (July of fiscal year 2025/26), Caltrans is almost 2 years into the SHOPP Ten-Year Book planning period. Therefore, for the time interval under consideration, fiscal years 2023/24 to 2032/33, Caltrans District 10 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 and end of the planning period. As pointed out in Chapter 6, *Benefiting Transportation Project Considerations*, given the expected timing of mitigation need, at this time (July of fiscal year 2025/26) mitigation that can be purchased or established by fiscal year 2027/28 (within the next 2 years) could potentially address approximately:

- 1.9 acre of California red-legged frog habitat, 0.6 acre of California tiger salamander habitat, 2 acres of foothill yellow-legged frog habitat, 1.5 acre of Sierra Nevada yellow-legged frog habitat, and 1 acre of California spotted owl habitat in the Sierra Nevada Ecoregion Section, potentially contributing to the acceleration of 2, 1, 1, 2, and 2 transportation projects, respectively
- 0.6 acre of California red-legged frog habitat, 0.3 acre of California tiger salamander habitat, 0.6 acre of foothill-yellow legged frog habitat, and 0.1 acre of California spotted owl habitat in the Sierra Nevada Foothills Ecoregion Section, potentially contributing to the acceleration of 1, 1, 1, and 1 transportation projects, respectively
- 0.1 acre of non-wetland waters and up to 0.6 acre of area of potential riparian function impacts in the Upper Calaveras California sub-basin, potentially contributing to the acceleration of 1 and 1 transportation projects, respectively
- up to less than 0.1 acre of area of potential riparian function impacts in the Upper Carson sub-basin, potentially contributing to the acceleration of 1 transportation project
- Less than 0.1 acre of wetland, 0.7 acre of non-wetland waters, and 0.9 to 2 acres of potential riparian function impacts in the Upper Merced sub-basin, potentially contributing to the acceleration of 1, 1, and 1 transportation projects, respectively
- Less than 0.1 acre of fish habitat, less than 0.1 acre of non-wetland waters, and less than 0.1 to 0.1 acre of area of potential riparian function impacts in the Upper Mokelumne sub-basin, potentially contributing to the acceleration of 1, 1, and 1 transportation projects, respectively
- Less than 0.1 acre of fish habitat, 0.1 acre of wetland, less than 0.1 acre of non-wetland waters, and up to 0.1 acre of area of potential riparian function impacts in the Upper Stanislaus sub-basin, potentially contributing to the acceleration of 1, 1, 1, and 2 transportation projects, respectively

All or some of these needs could form the basis for the Caltrans District to develop an advance mitigation project scope implementing one or more SHC § 800.6(a) authorized activity.

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 2025/26), 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 as well as 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, as well as 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 FHWA, 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 engaging stakeholders, analyzing project alternatives, coordinating 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.

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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 10 Regional Advance Mitigation Needs Assessment* ("RAMNA"), the California Department of Transportation ("Caltrans") District 10 presents its forecast of natural resource compensatory mitigation¹¹ 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 units¹² 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>.

¹¹ 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.

¹² "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”).	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 ^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)
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

^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 the California Fish and Game Code ("FGC") § 1850–1861.

^e The State Water Resources Control Board ("SWRCB") does not typically approve establishment of or accept preservation credits.

^f 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 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 State Highway Operation and Protection Program ("SHOPP") and State Transportation Improvement Program ("STIP")¹³ transportation projects will reimburse the AMA for advance mitigation project investments, thereby making the funds available to undertake the next advance mitigation project.

¹³ Only SHOPP- and STIP-funded transportation projects are eligible to use the AMA-funded pre-transfer credits (SHC § 800.7).

Figure 1-1. Advance Mitigation Planning Phase



Source: Caltrans (2019a)

Figure 1-2. Advance Mitigation Project Delivery Phase



Source: Caltrans (2019a)

1.1.2. Advance Mitigation Planning Phase

Caltrans' advance mitigation planning starts with modeled estimates of potential impacts on more than 600 wildlife and aquatic resources and, through successive steps, focuses and refines Caltrans' need for advance mitigation in order to inform advance mitigation project scopes that will be approved by the Caltrans Director. 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.¹⁴

Caltrans District 10 will first use the information and analyses presented in this RAMNA to inform Step 4 of the advance mitigation planning phase. Step 4 is the point when Caltrans justifies, proposes, and scopes an advance mitigation project based on its needs (Figure 1-1; Caltrans 2019a). Advance mitigation project scopes informed by this RAMNA

¹⁴ 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).

will provide enough information, at the appropriate level of detail, 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 10 advance mitigation project for funding (Step 5; Figure 1-1; Caltrans 2019a). Thereafter, Caltrans District 10 will use the RAMNA as a reference (Caltrans 2019a).

1.1.3. Advance Mitigation Project Delivery Phase

Steps 6 through 10 consist of the AMP's advance mitigation project delivery phase (Figure 1-2; Caltrans 2019a). Advance mitigation project delivery is undertaken after an advance mitigation project has been approved by the Caltrans Director and programmed¹⁵ (Figure 1-2; Caltrans 2019a). The phase consists of implementing one or more of the 11 authorized advance mitigation activities (Table 1-1).

1.1.4. Program Constraints

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

- Gas tax-derived funds may be used 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

¹⁵ 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.

- Natural resource 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, 2023 U.S. Fish and Wildlife Service (“FWS”) Mitigation Policy, FWS Endangered Species Act Compensatory Mitigation Policy, and 2022 National Oceanic and Atmospheric Administration (“NOAA”) Mitigation Policy for Trust Resources express a preference for advance mitigation (in several forms) but also provide flexibility for off-site and out-of-kind mitigation where important aquatic resources within 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, such as transportation 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 10 Transportation Infrastructure¹⁶

Headquartered in Stockton, Caltrans District 10 is responsible for maintaining and operating 1,395 centerline miles in Alpine, Amador, Calaveras, Mariposa, Merced, San Joaquin, Stanislaus, and Tuolumne Counties. The SHS roadways within District 10 range from scenic two-lane highways to controlled-access freeways. State Routes 49 and 89 are north-to-south routes in the geographic area of interest (“GAI”). State Routes 4, 26, 88, 108, 120, and 140 are east-to-west routes in the GAI.

Figure 1-3 shows the road infrastructure in the GAI for this RAMNA.

¹⁶ Adapted from: <https://dot.ca.gov/caltrans-near-me/district-10/district-10-popular-links/about-caltrans-district-10>

Other transportation agencies that implement transportation improvements within Caltrans District 10's boundaries (MPOs, RTPAs, and other public agencies) are the Alpine County Local Transportation Commission, Amador County Transportation Commission, Calaveras Council of Governments, El Dorado County Transportation Commission, Madera County Transportation Commission, Mariposa County Local Transportation Commission, Merced County Association of Governments, Sacramento Area Council of Governments, Stanislaus Council of Governments, Tahoe Metropolitan Planning Organization, Tahoe Regional Planning Agency, and Tuolumne County Transportation Council. The aforementioned transportation agencies are eligible for 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 ("FESA") (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 1890, 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.

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

Partner	Web Address
CDFW, North Central Region	https://wildlife.ca.gov/regions/2
CDFW, Central Region	https://wildlife.ca.gov/regions/4
CDFW, Inland Deserts Region	https://wildlife.ca.gov/Regions/6
SWRCB	https://www.waterboards.ca.gov/
California Regional Water Quality Control Board ("RWQCB"), Central Valley	https://www.waterboards.ca.gov/centralvalley/
RWQCB, Lahontan	http://www.waterboards.ca.gov/lahontan/
National Marine Fisheries Service ("NMFS"), West Coast Region	https://www.fisheries.noaa.gov/about/west-coast-region
NMFS, Central Valley Office	https://www.fisheries.noaa.gov/west-coast/about-us/california-central-valley
U.S. Army Corps of Engineers ("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/
FWS, Reno Field Office	https://www.fws.gov/reno/
FWS, Sacramento Field Office	https://www.fws.gov/sacramento/

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.

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,¹⁷ and in-lieu fee programs require 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.

Additional information regarding the natural resource regulatory agencies with authority to condition transportation project delivered within the delivered GAI with wildlife resource-related compensatory mitigation is provided in Table 7-1, Natural Resource Regulatory Agencies with the Authority to Approve Wildlife Resource Compensatory Mitigation Credits (or Values).

1.4 SAMNA

Predicting likely future transportation project effects on natural resources takes place at the intersection of transportation 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 & Protection Program Ten-Year Project Book 2023/24—2032/33* (“SHOPP Ten-Year Book”; Caltrans 2023a) for fiscal years 2023/24 to 2032/33. 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 2023b). 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 2023b). The subset of the Caltrans District 10 transportation projects that are planned in the GAI during the planning period covered by this RAMNA, and the eight-digit hydrologic unit code (“HUC-8”), ecoregion section, advertised year, and planned activities for each planned

¹⁷ 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.

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 (2023b). Results are presented in four different reports: terrestrial and aquatic species and subspecies, threatened and endangered fish, wetlands, and non-wetland waters. 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 2023b). 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;
- 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 therefore be fully liable.

1.4.1. Riparian Landcover Dataset

The Riparian Zone Estimator Tool (“RipZET”) is a Microsoft Excel and GIS-based decision support tool developed by the San Francisco Estuary Institute (“SFEI”) to estimate the extent of riparian areas based on the concept of “functional riparian width.” According to this concept, various riparian functions can extend different distances from their adjacent surface waters, depending on local topographic slope, vegetation, and position along a drainage network. More information about the science behind RipZET can be found in SFEI (2015a).

Since 2015, RipZET has been used in smaller and more regional studies across California and has been refined a number of times by SFEI. However, in 2023, SFEI developed a larger-scale statewide riparian landcover dataset for Caltrans to assist with advance mitigation planning (Caltrans 2023d). For this statewide product, SFEI used readily

available data that were appropriate for the larger scale of the analysis (Caltrans 2023d). For example, SFEI used elevation data that are less detailed than recommended in SFEI (2015b) because high-resolution statewide data are not available—SFEI used 5-meter NextMAP data, not the recommended 0.5-meter LiDAR data. More information regarding the inputs to the statewide landcover dataset can be found in Caltrans (2023d). Further, it was not feasible to perform the field verification step used for the smaller-scale efforts. More information regarding the process and computations within RipZET's modules can be found in SFEI (2015b).

Whether the statewide riparian landcover dataset developed for Caltrans improves forecasts of Caltrans riparian-related mitigation needs is currently unknown. Statewide outputs are not regarded as riparian maps *per se* because they do not depict actual boundaries based on field observations. Instead, they represent modeled areas where riparian functions are likely to be supported based on hillslope and vegetation processes (Caltrans 2023d). Hence, the modeled impacts presented in this RAMNA using the statewide riparian landcover dataset layer are better understood to be forecast impacts on areas of potential riparian function, more so than on riparian habitat itself, and are likely more extensive than actual impacts on riparian habitat or the vegetation associated with the bed and bank of streams or lakes. For transportation project environmental studies and permits, the extent of potential impacts on fish and wildlife resources associated with modification of the bed and bank of wetland and non-wetland water resources will ultimately be determined by biologists in the field.

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) having 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 also benefit other environmental resources.

1.5.1. GAI

As pointed out in Section 1.4, the RAMNA is consistent with SAMNA Reporting Tool geospatial data and model assumptions. In consultation with the natural resource regulatory agencies, it was determined that presenting SAMNA results by HUC-8 sub-basin 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. To identify a focus area, consistent with

Step 2 of the advance mitigation planning process (Figure 1-1), in 2025, Caltrans District 10 subject matter specialists:

- reviewed the entirety of Caltrans District 10's SAMNA results by HUC-8 sub-basin and ecoregion (Caltrans 2023b; available on: www.dot.ca.gov/programs/environmental-analysis/biology/advancemitigation);
- reviewed the SAMNA results' associated future transportation project locations and activities anticipated for the SHOPP (Caltrans 2023b);
- 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 previously performed in 2022 (Caltrans 2022a);
- observed that the portions of Caltrans District 10 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 10 and other public agencies that implement transportation improvements could benefit from advance mitigation planning—hereafter called the “GAI” (Figure 1-3).

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 10, Caltrans District 9 may choose to take the lead on an advance mitigation project that would address its needs in the GAI.

1.5.2. Terrestrial 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 Caltrans District 10. 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 10 identified species that, if compensatory mitigation credits were available, transportation projects could potentially benefit. The determination is made after reviewing SAMNA results for the planning period. The terrestrial “species of mitigation need” are California red-legged frog (*Rana draytonii*), California tiger salamander (*Ambystoma californiense*), foothill yellow-legged frog (*Rana boylei*), Sierra Nevada yellow-legged frog (*Rana sierrae*), western spadefoot (*Spea hammondi*), and California spotted owl (*Strix occidentalis occidentalis*). California red-legged frog is federally listed as threatened and is a California species of special concern. The Central California Distinct Population Segment (“DPS”) of California tiger salamander is federally and state listed as threatened. Foothill yellow-legged frog in the GAI falls within the south Sierra DPS, which is listed as federal and state endangered. Sierra Nevada yellow-legged frog

is federally listed as endangered and state listed as threatened. Western spadefoot is proposed for listing as federally threatened and is a California species of special concern. The Sierra Nevada DPS of California spotted owl is proposed for federal listing as threatened.

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

1.5.3. Aquatic Resources, Fish Species of Mitigation Need, and Riparian Habitat

For the purposes of this document, aquatic resources include all wetlands and non-wetland waters that may be subject to California Coastal Commission (“CCC”), Corps, EPA, SWRCB and RWQCB (“Water Boards”), and/or CDFW regulations, as well as threatened and endangered fish that may be subject to CCC, CDFW, FWS, and/or NMFS regulations. Fish species of mitigation need identified for this RAMNA include the federally threatened Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*), federally threatened Paiute cutthroat trout (*Oncorhynchus clarkii seleniris*), and federally threatened steelhead – Central Valley DPS (*Oncorhynchus mykiss*). Riparian habitat is described in Section 2.16.

Compensatory mitigation needs for aquatic resources 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 10. SHOPP transportation projects have historically been conditioned by natural resource regulatory agencies for these resources and have benefited from mitigation credits, when available.

The following sub-basins inform the analysis of estimated aquatic resources compensatory mitigation needs provided in Chapter 5, *Modeled Estimated Impacts*, and Chapter 6, *Benefiting Transportation Project Considerations*, and the discussion in Chapter 8, *Aquatic Resources Conservation Goals and Objectives*:

- Middle San Joaquin-Lower Chowchilla (HUC-8 18040001)
- Mono Lake (HUC-8 18090101)
- South Fork American (HUC-8 18020129)
- Upper Calaveras California (HUC-8 18040011)
- Upper Carson (HUC-8 16050201)
- Upper Merced (HUC-8 18040008)
- Upper Mokelumne (HUC-8 18040012)
- Upper Stanislaus (HUC-8 18040010)
- Upper Tuolumne (HUC-8 18040009)

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 within District 10, referred to as the GAI;
- applies to fiscal years 2023/24 to 2032/33 (planning period), which is concurrent with the time period addressed by the SHOPP Ten-Year Book (Caltrans 2023a);
- discusses potential compensatory mitigation conditions that may be placed on future transportation projects by the seven resource and regulatory agency signatories¹⁸ to the *Master Process Agreement for Planning and Developing Advance Mitigation throughout California for the California Department of Transportation Advance Mitigation Program* (“Master Process Agreement”; 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 resource¹⁹ compensatory mitigation needs for the GAI and planning period, as reported by the SAMNA (Caltrans 2023b);
- 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).

¹⁸ Natural resource regulatory signatories are CDFW; SWRCB; Corps Los Angeles, Sacramento, and San Francisco Districts; EPA; FWS; NMFS; and CCC.

¹⁹ *Aquatic resource* is defined in Section 1.5.3.

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

Caltrans is authorized to provide AMA-funded mitigation credits to MPOs, RTPAs, and other public agencies that implement transportation projects, upon reimbursement, for their use to satisfy STIP-funded transportation project mitigation. Transportation projects eligible for STIP funding may increase the potential demand for compensatory mitigation in an area. Caltrans District 10 Transportation Planning has regularly scheduled meetings with Alpine County Local Transportation Commission, Amador County Transportation Commission, Calaveras Council of Governments, Mariposa County Local Transportation Commission, Merced County Association of Governments, Mono County Local Transportation Commission, Stanislaus Council of Governments, and Tuolumne County Transportation Council. At this time (July of fiscal year 2025/26), six STIP transportation projects in their planning phase and located in the GAI were identified for the planning period.

1.7.2. RAMNA Review

The AMP Guidelines (Caltrans 2019a) state:

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

In March 2025, 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 6, 2025
Caltrans District 10	July 1, 2025
State Water Board	May 29, 2025
U.S. Fish and Wildlife Service	May 20, 2026
U.S. Army Corps of Engineers	May 7, 2025

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

1.7.3. 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, EPA, Corps, FWS, and Caltrans	March 24, 2025
Caltrans D10 and AMP	January 23, 2026
Caltrans and CDFW	February 4, 2026

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; and comprehensive, conservation, and land management plans that are applicable and relevant to the GAI and informs both regional understanding and advance mitigation scoping.

Chapter	Title	Content
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 in 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 protecting natural resources through transportation project mitigation.
Chapter 10	References	This chapter lists references cited in the RAMNA.
Appendices	Various	Appendices supporting this document: Appendix A – GIS Sources Appendix B – 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

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 2018). Sources used for this assessment are cited throughout the chapter, and links to GIS sources are provided in Appendix A, *GIS Sources*.

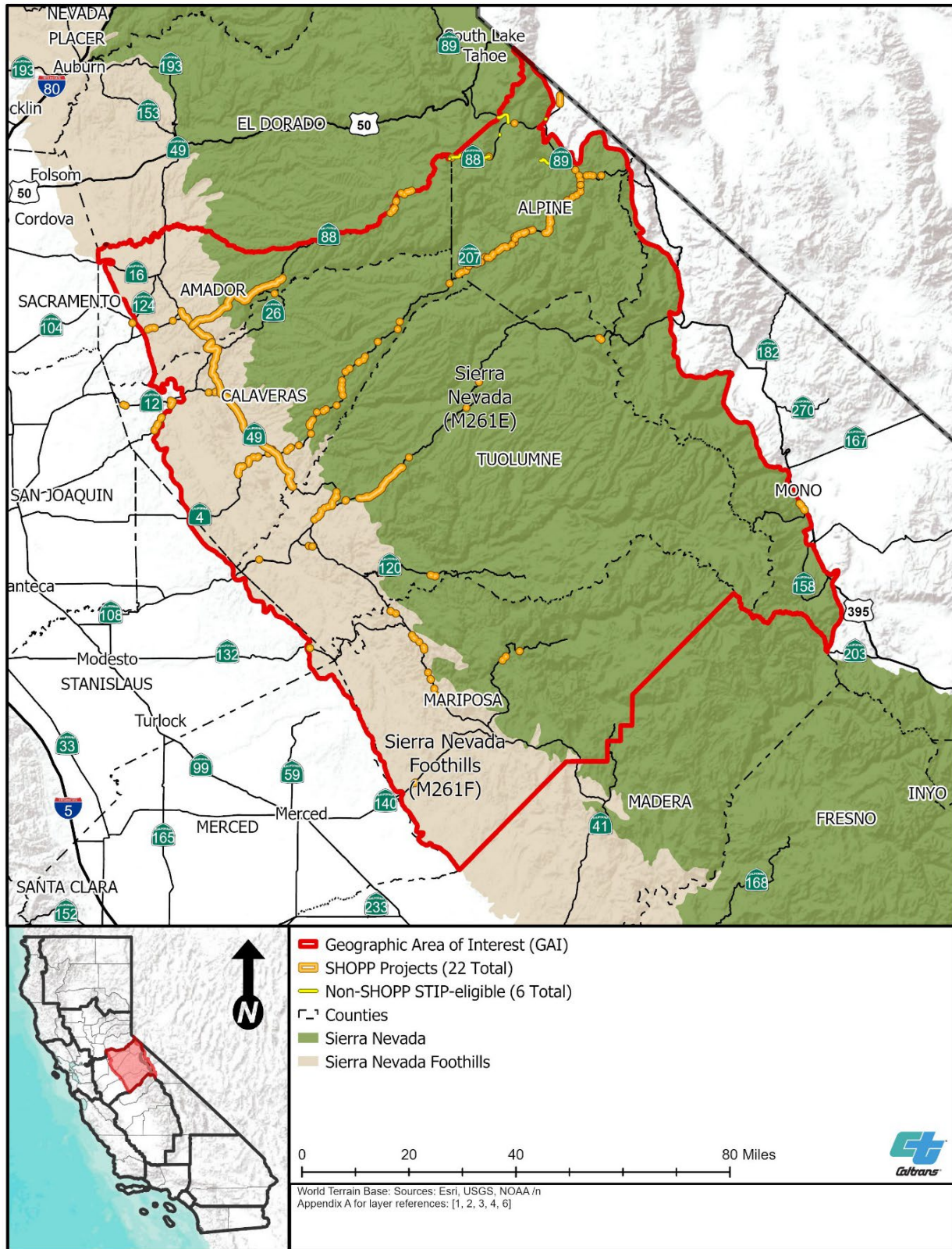
On each figure, Caltrans has provided the general location of planned SHOPP and STIP transportation projects that, during the 10-year planning period addressed by this document, natural resource regulatory agencies may condition with compensatory mitigation. The GAI's road infrastructure is described 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 4.1 million acres within the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections, which are overlapped by portions of 17 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"), Forest Service ("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.

Figure 2-1. Ecoregion Sections in the GAI



2.2 Land Ownership

The GAI spans parts of Alpine, Amador, Calaveras, Mariposa, Merced, Mono, Stanislaus, and Tuolumne Counties (Figure 2-2). Federal lands, which account for most of the land in the GAI (61.6 percent), are administered and managed by USDA's USFS; Corps; the U.S. Department of the Interior's Bureau of Land Management ("BLM"), Bureau of Reclamation, National Park Service ("NPS"); and the U.S. Department of Defense's military bases. Privately owned and managed land accounts for 35.6 percent of land in the GAI. Only 1.6 percent is managed by nonprofit conservancies and land trusts; 0.7 percent is governed by counties, cities, and special districts; and 0.1 percent is owned by Native American tribes. State lands, which account for 0.5 percent of land in the GAI, include lands owned and managed by the California Department of Parks and Recreation, California State Lands Commission, CDFW, California Department of Forestry and Fire Protection, 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, GAP status 1 lands are identified in the database for the GAI—mostly associated with the Sierra Nevada range—and most of the planned SHOPP transportation projects are in areas considered Rank 3. Lands with conservation easements are also identified in the California Protected Areas Database; some of the planned SHOPP transportation projects are proximate to conservation easements (Figure 2-3).

Table 2-1. Land Ownership

Landowner or Land Use	Total Acreage per Agency/Owner ^a	Ownership as Percentage of GAI
USFS	1,600,882	38.8
Private (agriculture)	1,073,533	26.0
NPS	667,510	16.2
Private (unassigned)	225,256	5.5
BLM	176,881	4.3
Private (urban and other)	169,371	4.1
Nonprofit conservancy and land trust	65,307	1.6
U.S. military bases	60,577	1.5
City, county, and special district	29,669	0.7
U.S. Bureau of Reclamation	23,627	0.6
CDFW	11,426	0.3
California Department of Parks and Recreation	7,434	0.2
Corps	6,563	0.2
Tribal lands	2,231	0.1
California State Lands Commission	1,777	<0.1
California Department of Forestry and Fire Protection	1,201	<0.1
Other state agency	628	<0.1
Private (natural vegetation)	1	<0.1
Total	4,127,872	100%

Sources: Bureau of Indian Affairs; California Protected Lands Database; California Conservation Easement Database; Caltrans (2023c); 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

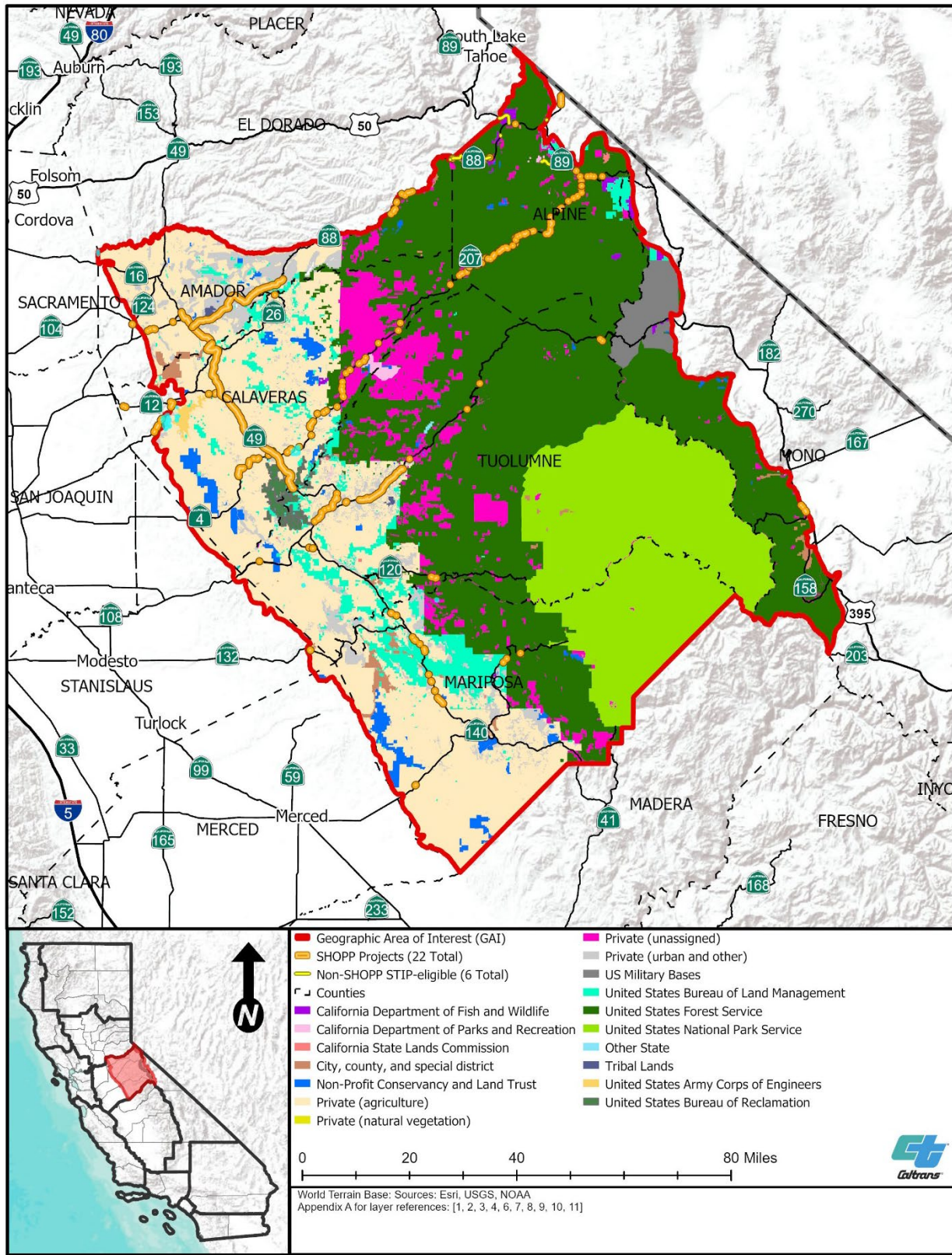
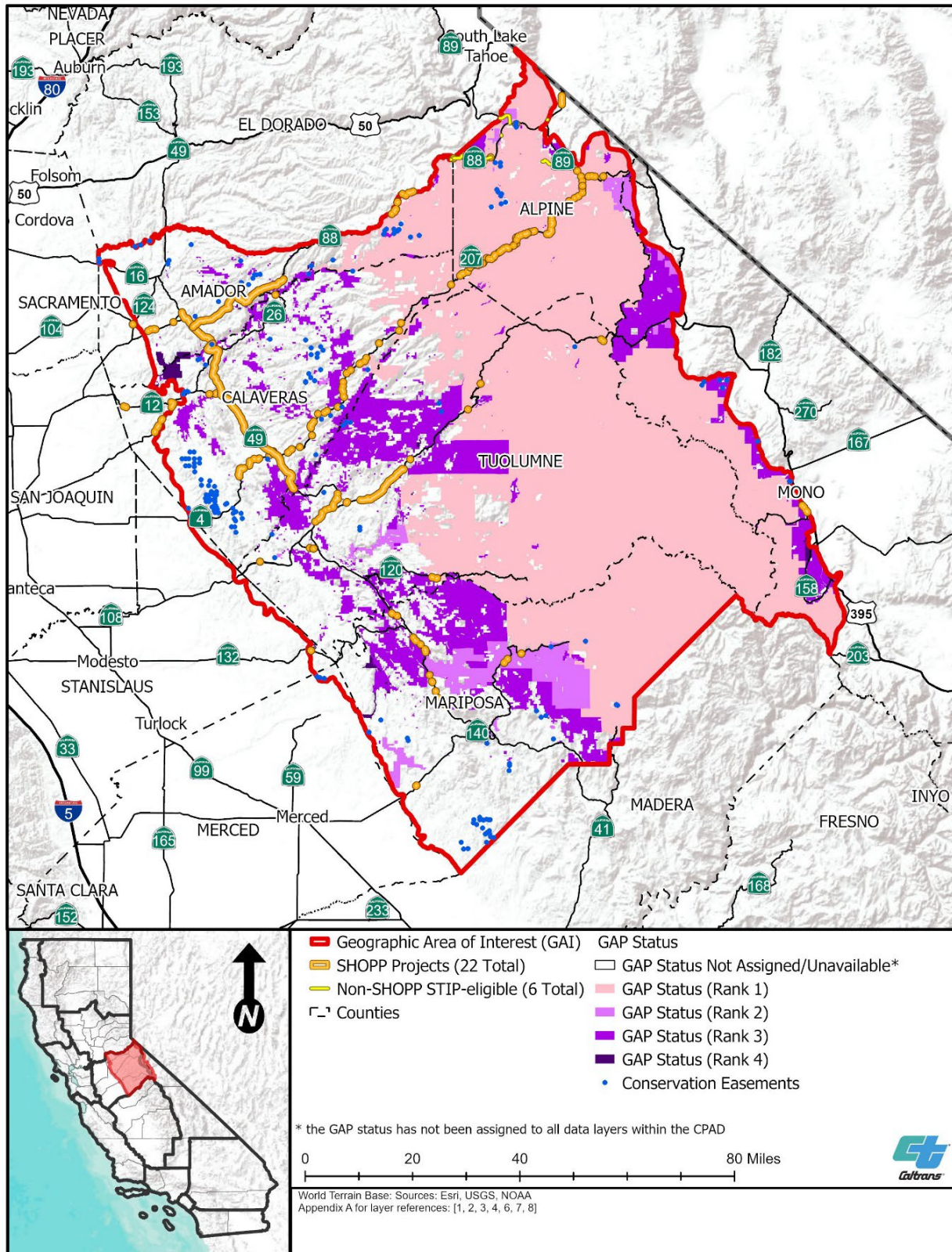


Figure 2-3. Protected Lands



2.3 Topography

The GAI is located in central California, east of the San Joaquin Valley, entirely within the Sierra Nevada and foothills to the west. It lies south of the El Dorado National Forest, bounded by the San Joaquin Valley on the west as well as Mono Lake and Humboldt-Toiyabe and Inyo National Forests on the east. Elevations in the GAI range from 175 to 13,058 feet above mean sea level (Figure 2-4).

2.4 Climate

The GAI is characterized by hot, dry summers and cold winters with precipitation influenced by altitude and direction of mountain ranges. Precipitation most often occurs as snow (McNab et al. 2007). The average temperature ranges from 55 to 66 degrees Fahrenheit, with peak temperatures of 90 to 100 degrees Fahrenheit during summer and winter temperatures occasionally dropping below freezing (U.S. Bureau of Reclamation 2014). The Sierra Nevada ranges receive an average of 30 to 80 inches of precipitation annually, with snowfall at approximately 5,000 feet in elevation at the northern end and higher at the southern end (University of California 2015).

Over 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.

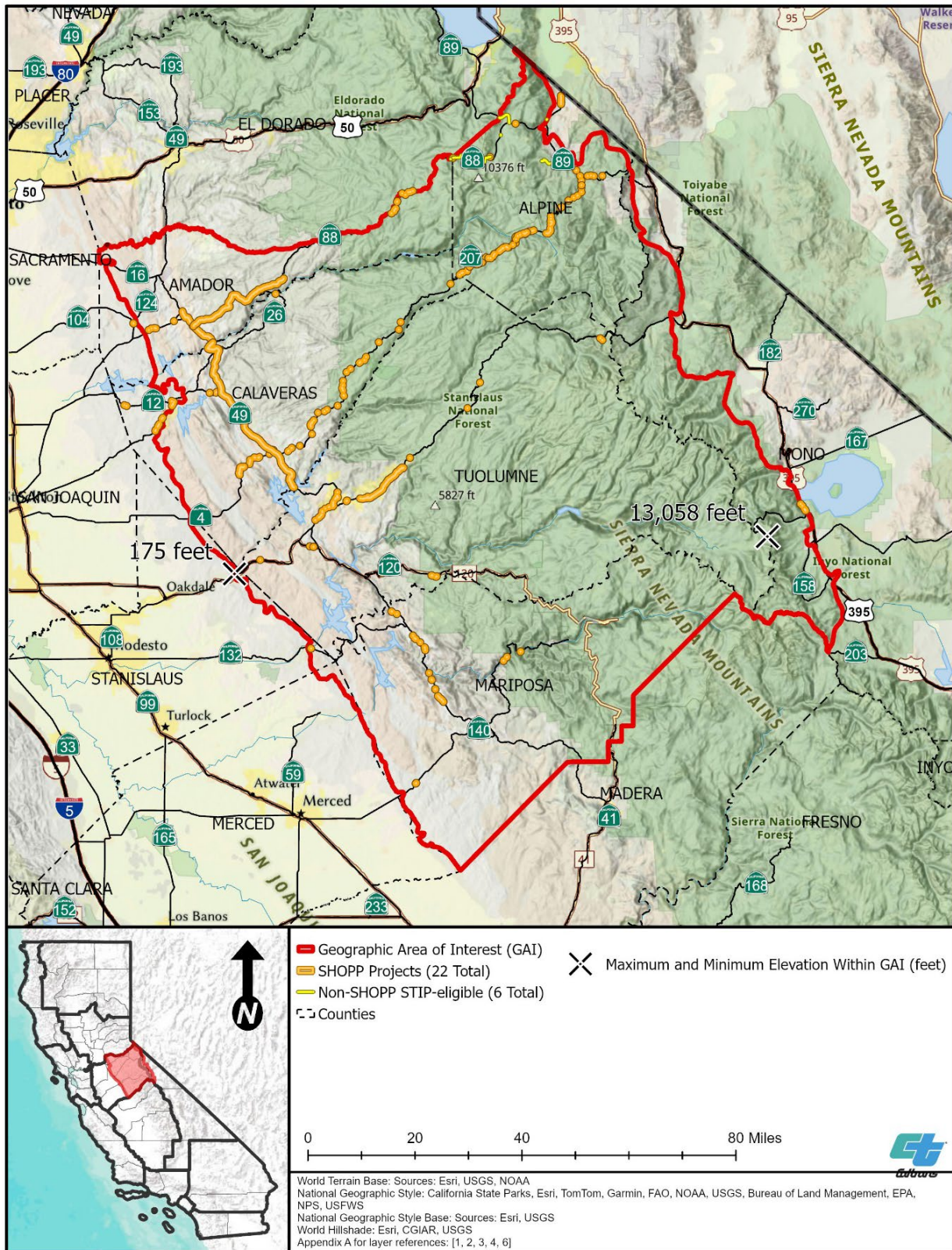
2.4.1. Climate Vulnerability Assessment

In 2019, Caltrans performed a statewide climate change vulnerability assessment for the SHS (Caltrans 2019b). The analysis provided in the *Caltrans Climate Change Vulnerability Assessments: District 10 Technical Report* (Caltrans 2019b) 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 during the next few years, then begin to decline substantially; representative concentration pathway 4.5, which assumes emissions will peak around 2040, 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 during 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 2019b).

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 scenarios—one with no reductions in carbon dioxide emissions, and one with a peak in 2040 followed by a significant decline in carbon dioxide 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. Figure 2-5 presents the terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a). There is a pattern of lower resilience in the western portion of the GAI, associated with the foothills of the Sierra Nevada. Areas with higher resilience occur within the peaks of the Sierra Nevada.

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 2023e). Based on these data, tree-dominated habitats account for the largest habitat type, encompassing 62.04 percent of the GAI, with Sierran mixed conifer being the most common (Table 2-2; Appendix C). Shrub-dominated habitats account for 14.30 percent of the GAI, with montane chaparral the most common. Herbaceous-dominated habitats account for 12.97 percent of the GAI, with annual grassland the most common. Non-vegetated, barren habitats account for 7.40 percent of the GAI. Aquatic habitats account for 2.19 percent of the GAI, with lacustrine the most common. Developed habitats account for 1.08 percent of the GAI, with urban habitats the most common (Table 2-2; Appendix C). Land cover is generally shown on Figure 2-6.

Figure 2-5. Terrestrial Climate Resilience Rankings

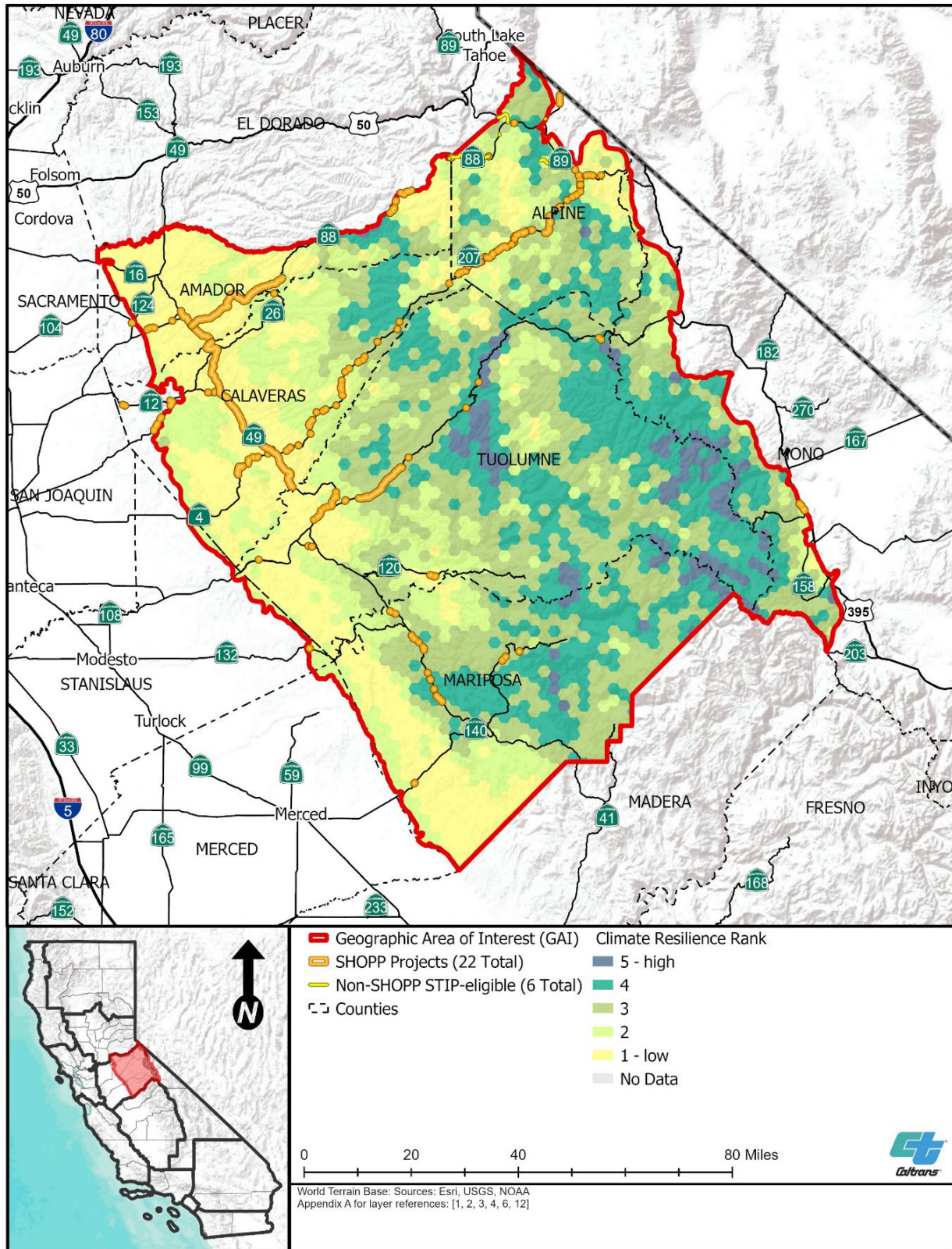


Table 2-2. Land Cover Types

CWHR Habitat Type	Acres^a	Cover as Percentage of GAI^b
Tree-dominated Habitats	2,569,044	62.04
Aspen	15,943	0.39
Blue Oak-Foothill Pine	25,719	0.62
Blue Oak-Foothill Pine; Blue Oak Woodland	153,204	3.70
Blue Oak Woodland	354,831	8.57
Closed-Cone Pine-Cypress	2,877	0.07
Douglas Fir	9,729	0.23
Eastside Pine	26,317	0.64
Eucalyptus	1	<0.01
Jeffrey Pine	81,038	1.96
Juniper	22,603	0.55
Lodgepole Pine	126,412	3.05
Montane Hardwood	309,094	7.46
Montane Hardwood-Conifer	131,910	3.19
Montane Riparian	23,518	0.57
Pinyon-Juniper	15,623	0.38
Ponderosa Pine	173,006	4.18
Red Fir	234,349	5.66
Sierran Mixed Conifer	596,752	14.41
Subalpine Conifer	190,243	4.59
Valley Foothill Riparian	5,682	0.14
Valley Oak Woodland	30,730	0.74
White Fir	39,462	0.95
Shrub-dominated Habitats	592,265	14.30
Alkali Desert Scrub	1	<0.01
Alpine Dwarf-Shrub	29,473	0.71
Bitterbrush	15,107	0.36
Chamise - Redshank Chaparral	67,411	1.63
Coastal Scrub	3	<0.01
Desert Scrub	43	<0.01

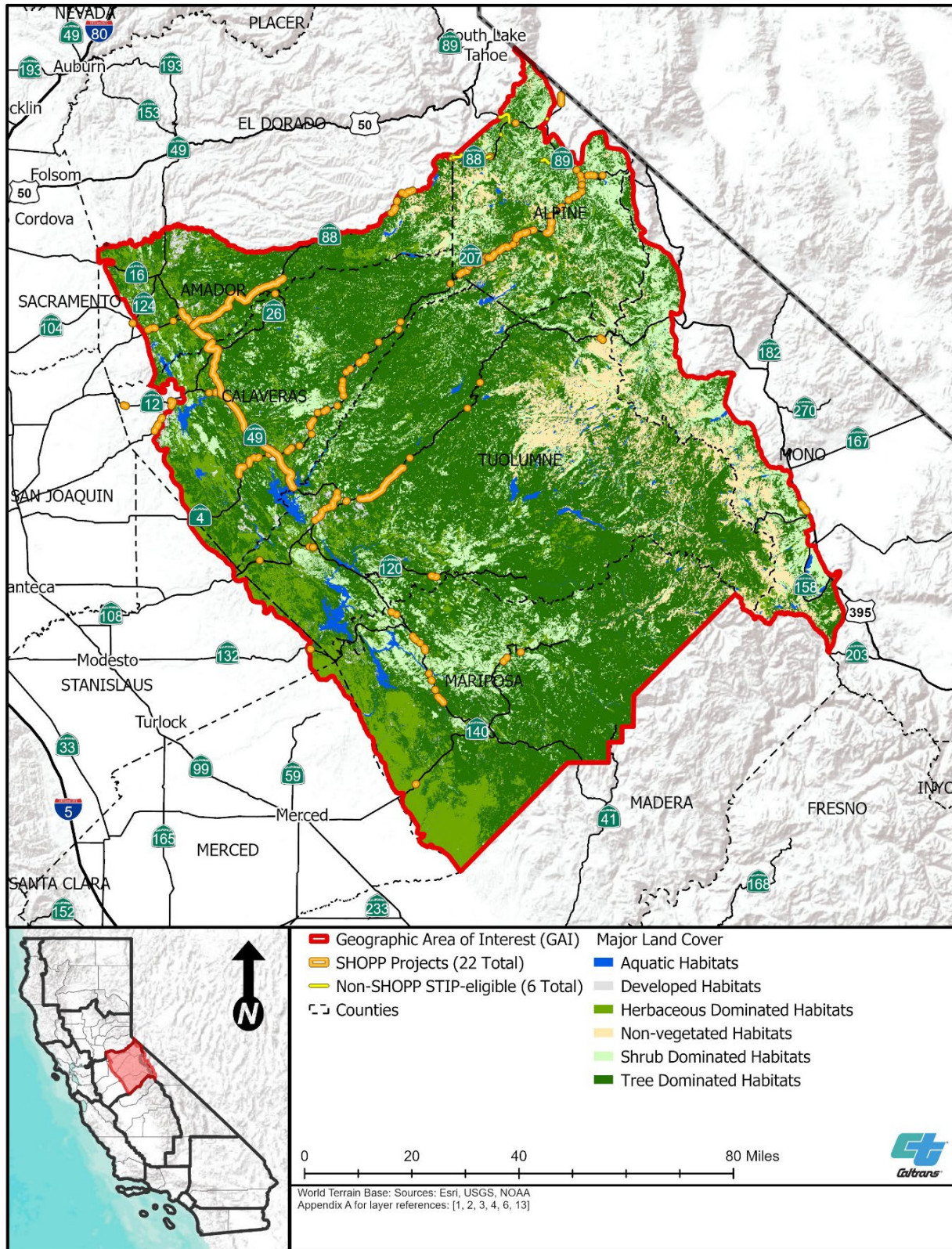
CWHR Habitat Type	Acres ^a	Cover as Percentage of GAI ^b
Low Sage	29,363	0.71
Mixed Chaparral	156,434	3.78
Montane Chaparral	178,199	4.30
Sagebrush	116,231	2.81
Herbaceous-dominated Habitats	537,224	12.97
Annual Grassland	446,809	10.79
Fresh Emergent Wetland	2,956	0.07
Pasture	1,338	0.03
Perennial Grassland	56,771	1.37
Wet Meadow	29,350	0.71
Aquatic Habitats	90,885	2.19
Lacustrine; Riverine	210	0.01
Lacustrine	71,331	1.72
Riverine	19,344	0.47
Developed Habitats	44,910	1.08
Cropland	7,325	0.18
Deciduous Orchard	19	<0.01
Evergreen Orchard	54	<0.01
Urban	37,447	0.90
Vineyard	65	<0.01
Non-vegetated Habitats	306,286	7.40
Barren	306,286	7.40
Total	4,140,615	100%

Source: Caltrans (2023e)

^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 2023a; 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 non-native plant species based on the severity of their potential ecological impacts (Cal-IPC 2023).

In the GAI, invasive plant species have been specifically identified as threats or stressors to terrestrial and aquatic biological resources (CDFW 2023a). Non-native, 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:

- Barb goatgrass (*Aegilops triuncialis*),
- 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*),
- rush skeletonweed (*Chondrilla juncea*),
- bull thistle (*Cirsium vulgare*),
- hedgehog dogtailgrass (*Cynosurus echinatus*),
- Scotch broom (*Cytisus scoparius*),
- medusahead (*Elymus caput-medusae*),
- rattail fescue (*Festuca myuros*),
- Italian ryegrass (*Festuca perennis*),

- French broom (*Genista monspessulana*),
- cutleaf geranium (*Geranium dissectum*),
- summer mustard (*Hirschfeldia incana*),
- common velvet grass (*Holcus lanatus*),
- Mediterranean barley (*Hordeum marinum*),
- hare barley (*Hordeum murinum*),
- perennial pepperweed (*Lepidium latifolium*),
- common St. Johnswort (*Hypericum perforatum*),
- oxeye daisy (*Leucanthemum vulgare*),
- Harding grass (*Phalaris aquatica*),
- Himalayan blackberry (*Rubus bifrons*),
- red sorrel (*Rumex acetosella*),
- Spanish broom (*Spartium junceum*), and
- hedgeparsley (*Torilis arvensis*) (Cal-IPC 2023; CDFW 2015a).

Non-native animals that are/may be present in the GAI and that can negatively affect aquatic species include, but are not limited to:

- barred tiger salamander (*Ambystoma mavortium*),
- western mosquitofish (*Gambusia affinis*),
- green sunfish (*Lepomis cyanellus*),
- bullfrogs (*Lithobates catesbiana*),
- nutria (*Myocastor coypus*),
- rainbow trout (*Oncorhynchus mykiss*),
- brook trout (*Salvelinus fontinalis*),
- brown trout (*Salmo trutta*),
- wild pig (*Sus scrofa*), and
- red-eared slider (*Trachemys scripta elegans*) (CDFW 2015a).

Non-native 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 Terrestrial 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 both occur in the GAI and be affected by future transportation projects 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 2021), and other information (Caltrans 2023b; 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, 81 non-fish special-status species are known to occur or have the potential to occur in the GAI (68 species in the Sierra Nevada Ecoregion and 59 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 ("CNDDDB") (Caltrans 2023b). When CWHR home range and/or CNDDDB 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 FESA. The FESA (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 FESA 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).

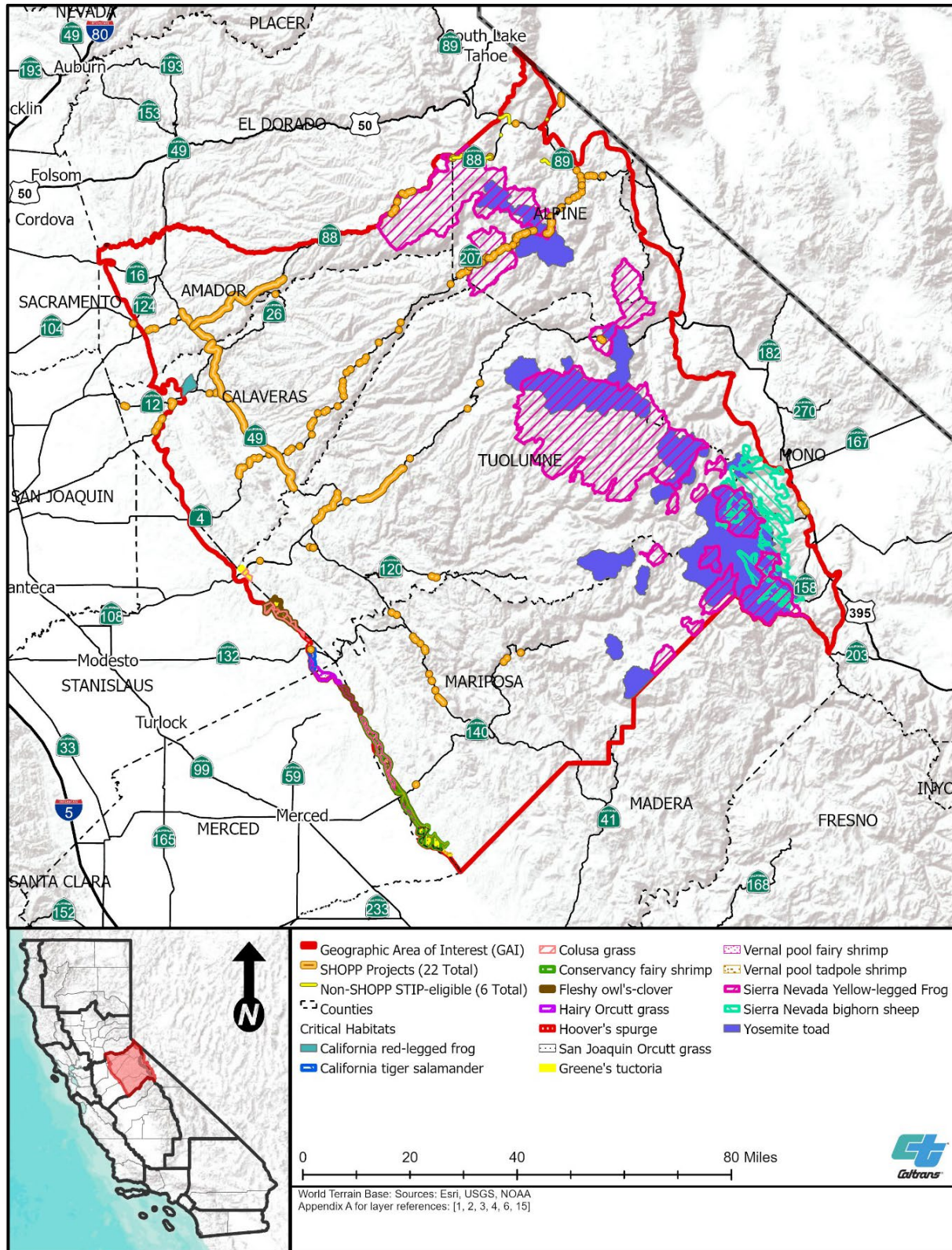
The GAI includes federally designated final critical habitat for 14 species (FWS 2021a):

- California red-legged frog (*Rana draytonii*)
- California tiger salamander (*Ambystoma californiense*)
- Colusa grass (*Neostapfia colusana*)

- conservancy fairy shrimp (*Branchinecta conservatio*)
- fleshy owl's-clover (*Castilleja campestris* ssp. *succulenta*)
- Greene's tuctoria (*Tuctoria greenei*)
- hairy Orcutt grass (*Orcuttia pilosa*)
- Hoover's spurge (*Euphorbia hooveri*)
- San Joaquin Orcutt grass (*Orcuttia inaequalis*)
- Sierra Nevada yellow-legged frog (*Rana sierrae*)
- Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*)
- vernal pool fairy shrimp (*Branchinecta lynchi*)
- vernal pool tadpole shrimp (*Lepidurus packardii*)
- 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 as well as 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 2020).

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 (2022) *Restoring California's Wildlife Connectivity 2022* 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 2018b, 2022; 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 2020) builds on the CEHC Project and includes mapped corridors or linkages and where they occur in relation to large, contiguous natural areas (Figure 2-8). It also incorporates species-specific, fine-scale linkage information developed at a regional scale, where available, and includes areas that were not evaluated by the CEHC Project.

Connectivity ranks in the terrestrial connectivity dataset were assigned as follows:

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

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

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

CDFW's Restoring California's Wildlife Connectivity 2022 Report

CDFW's *Restoring California's Wildlife Connectivity 2022* report identified priority wildlife movement barriers created by linear infrastructure across the state to 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.

Seven priority wildlife movement barriers were identified in the GAI. These barriers and target species for movement include (1) Highway 88 from Kirkwood to slightly east of Mehrten Spring Road in Alpine County (mule deer [*Odocoileus hemionus*], mountain lion [*Puma concolor*], and black bear [*Ursus americanus*]), (2) Highway 4 from Kinney Reservoir to Bear Valley in Alpine County (mule deer, mountain lion, and black bear), (3) State Route 108 in Donnell Vista in Tuolumne County (mule deer, mountain lion, black bear, and fisher [*Pekania pennanti*]), (4) Highway 395 Post Miles 90–97 in Mono County (mule deer, mountain lion, and black bear), (5) Highway 41 from Oakhurst to Wawona in Madera and Mariposa Counties (mule deer, mountain lion, and black bear), (6) Highway 4 from Skyhigh to Snowshoe Springs in Calaveras County (mule deer, mountain lion, and black bear), and (7) Highway 120 from Groveland to Yosemite in Mariposa County (mule deer, mountain lion, and black bear) (CDFW 2022).

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. It intersects with the western part of the GAI (Figure 2-9) (CDFW 2015b).

Figure 2-8. Terrestrial Connectivity

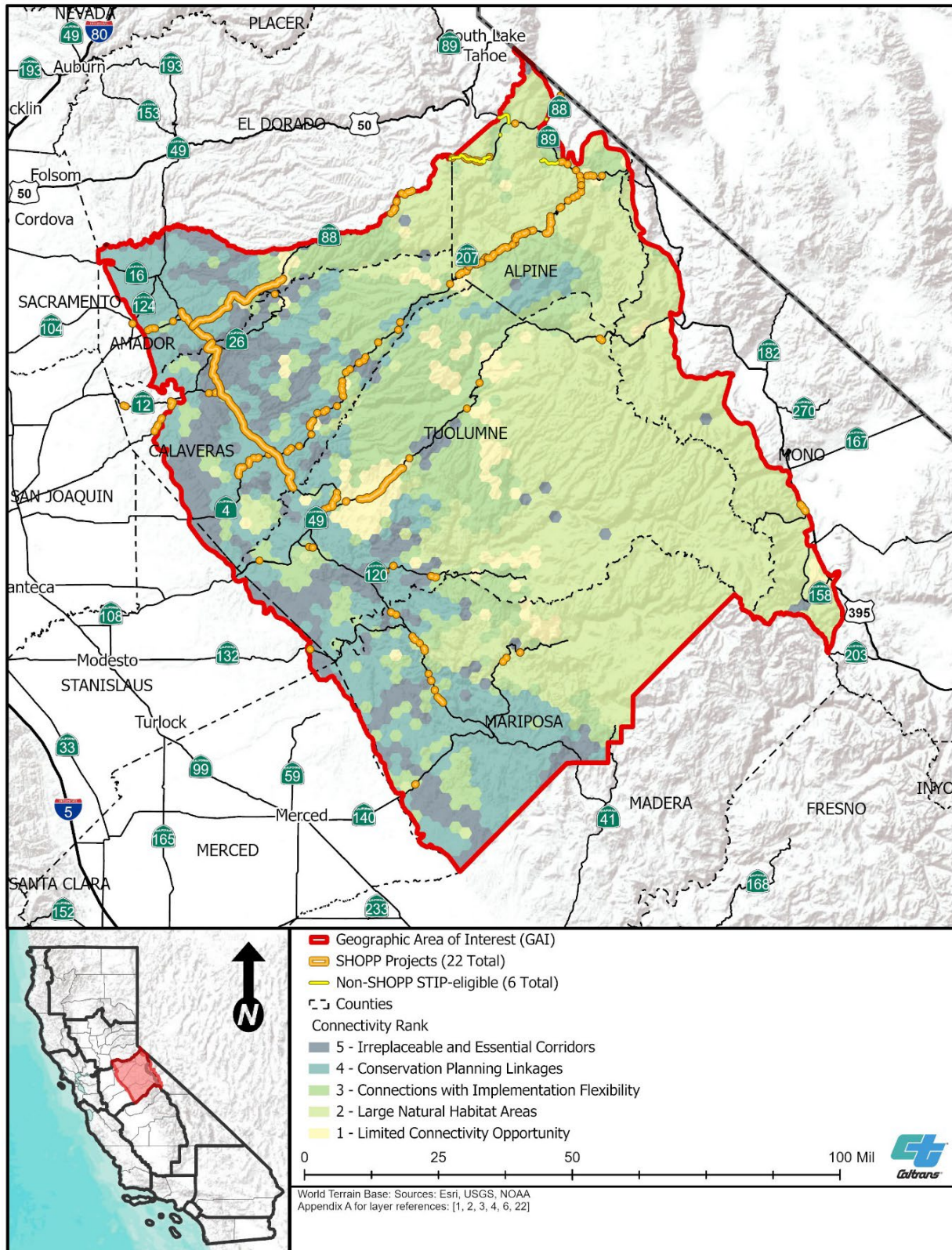
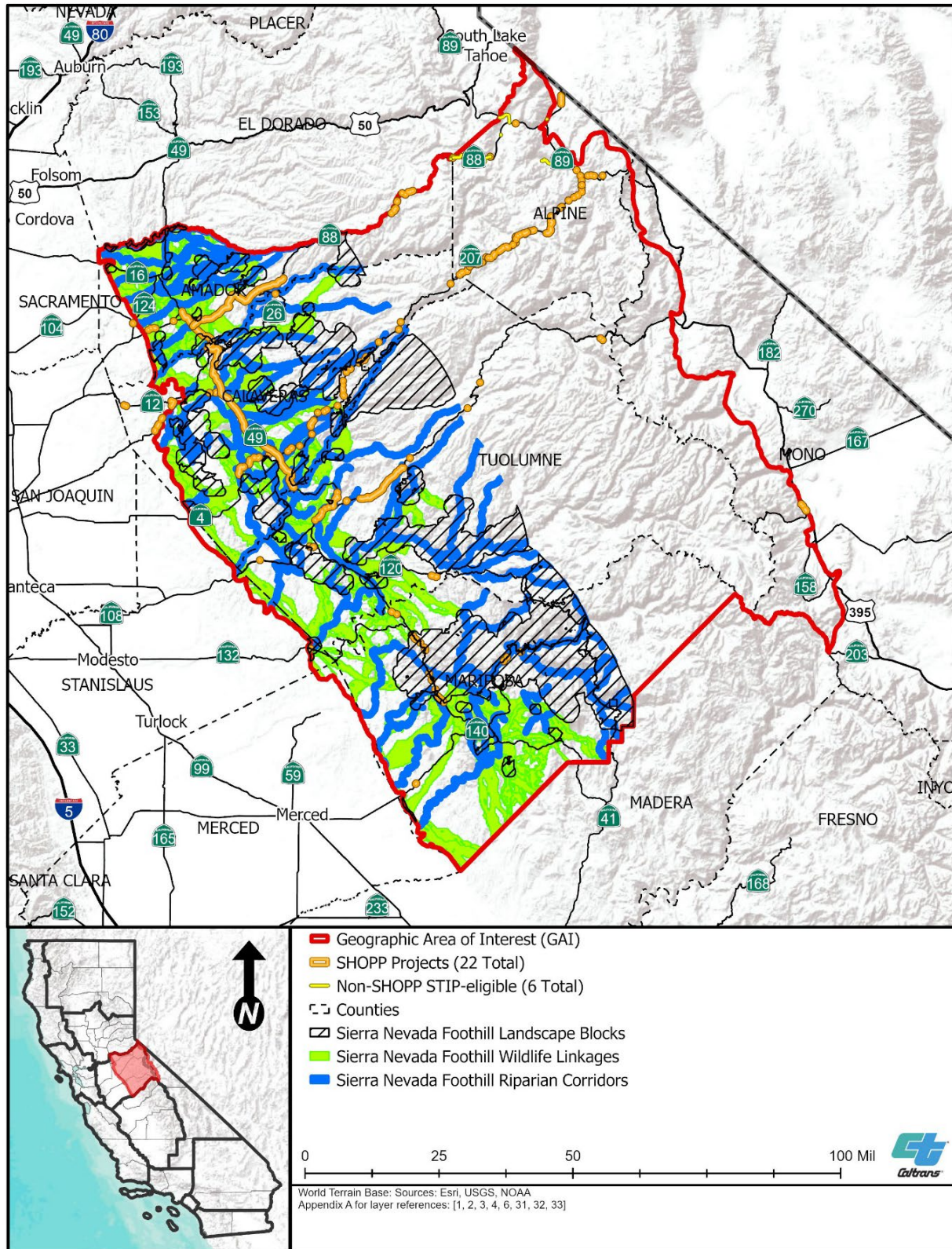


Figure 2-9. Sierra Nevada Foothills Wildlife Connectivity Modeling



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:

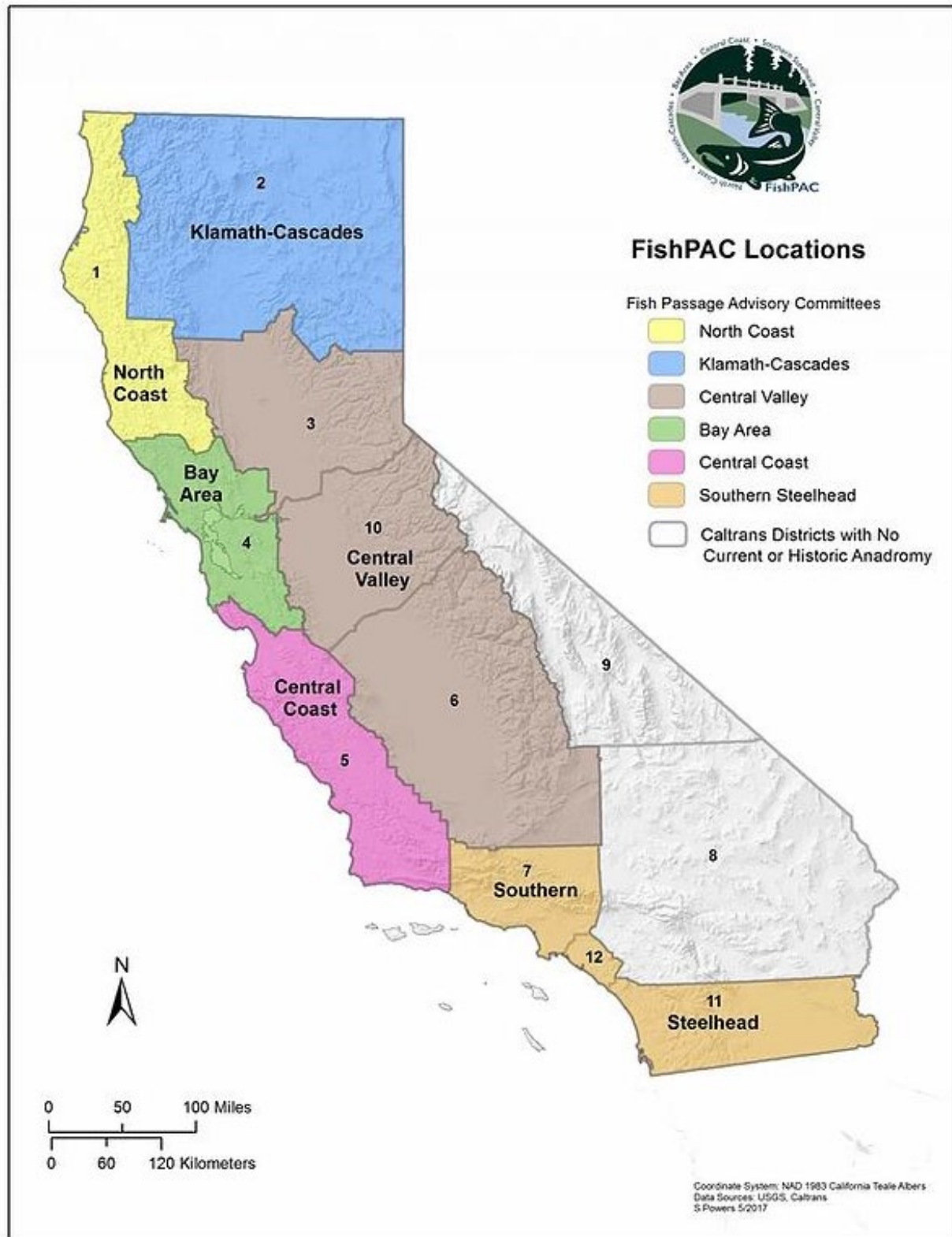
1. Provide an annual list of fish passage priorities for the SHS to the legislature. Fish Passage Annual Reports are available on the Caltrans Legislative Affairs website, and the most recent report is available from: <https://dot.ca.gov/programs/legislative-affairs/reports>.
2. Complete assessments 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 FESA 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 during the next 40 years:

- three identified species’ units currently listed as state and/or federally endangered: Central California Coast ESU coho salmon (*Oncorhynchus kisutch*, Sacramento River winter-run ESU chinook salmon (*O. tshawytscha*), and Southern California DPS steelhead (*O. mykiss*).
- 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 help to address sediment transport, water temperature, dissolved oxygen, and stream erosion issues.

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 helps 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 more than 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.

FishPACs help Caltrans advance the desired outcomes of SHC § 156 (J. Walth, Caltrans, personal communication, 2020). Since 2006, in collaboration with FishPACs, 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 the Fish Passage Annual Reports prepared by Caltrans and submitted to the legislature as required by SHC § 156.1.

As specified above, FishPACs also provide SHS-related information to the Fish Passage Assessment Database, to be incorporated into its periodic updates.² Information regarding verified SHS fish passage barriers is available through the appropriate FishPAC.

² More information about the Fish Passage Assessment Database can be found in CalFish (2018).

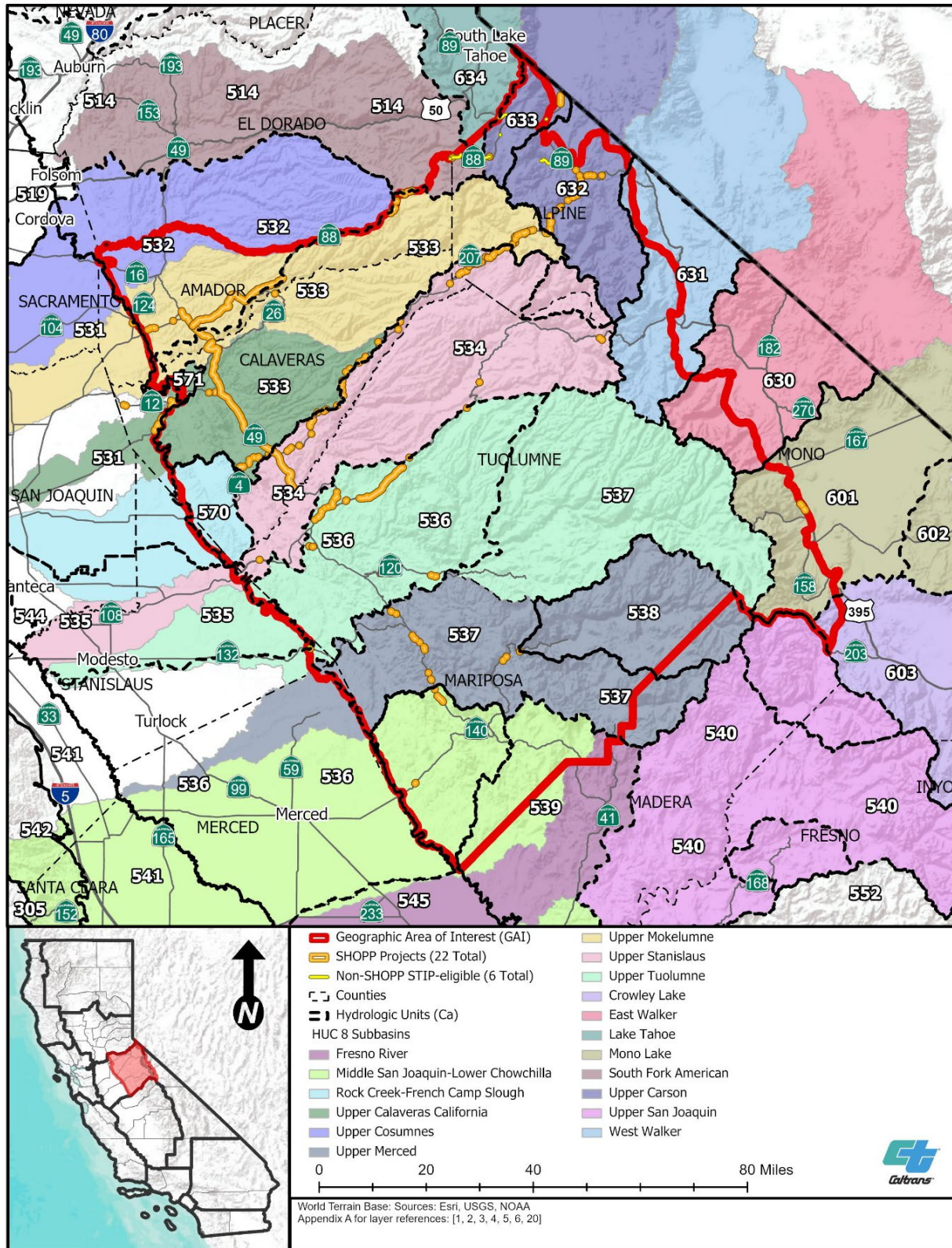
2.10 Sub-basins

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.

The SAMNA Reporting Tool expresses the landscape in terms of USGS HUC-8 sub-basins; therefore, information in this RAMNA is also presented by HUC-8 (Caltrans 2023b; USGS 2014). However, the California Department of Water Resources and the Water Boards 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 17 sub-basins, which loosely correspond to 20 HUs (Appendix E). Figure 2-11 shows the overlap between sub-basins and state-level HUs in the GAI.

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



2.11 Hydrology

The 17 sub-basins of the GAI drain an area of 4,123,030 acres (6,442 square miles) (Table 2-3, Figure 2-11). Described individually in Appendix E, these sub-basins include 9,027 rivers and streams that traverse 8,914 miles in the Central Valley RWQCB boundary (Table 2-3). Sub-basin acreages shown in Table 2-3 may include areas outside the GAI. Major rivers in the GAI include the Merced, Tuolumne, Stanislaus, and Walker Rivers. Snowmelt in the Sierra Nevada generates most of the flow into these rivers.

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
Crowley Lake	18090102	11,009	12	15
East Walker	16050301	72,045	125	115
Fresno River	18040007	7,978	6	7
Lake Tahoe	16050101	4,210	10	6
Middle San Joaquin-Lower Chowchilla	18040001	326,669	455	631
Mono Lake	18090101	121,407	143	152
Rock Creek-French Camp Slough	18040051	72,538	243	212
South Fork American	18020129	23,434	35	34
Upper Calaveras	18040011	253,951	986	787
Upper Carson	16050201	252,735	524	508
Upper Consumnes	18040013	58,338	211	164
Upper Merced	18040008	603,880	995	1,151
Upper Mokelumne	18040012	512,866	1,448	1,292
Upper San Joaquin	18040006	56	1	0
Upper Stanislaus	18040010	640,664	1,895	1,665
Upper Tuolumne	18040009	1,036,540	1,733	1,963
West Walker	16050302	124,712	205	212
Total	Not applicable	4,123,030	9,027	8,914

Source: California Department of Water Resources

^a Numbers were rounded to the nearest whole number.

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. Waterbodies associated with the majority of flood hazard risk in the GAI include Lake McClure, Don Pedro Reservoir, New Melones Lake, New Hogan Lake, and Pardee Reservoir. 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 Sacramento River Basin and the San Joaquin River Basin* (Central Valley RWQCB 2019) and *Water Quality Control Plan for the Lahontan Region* (Lahontan RWQCB 2021) (or Water Quality Control Plans ["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 are also identified in the Basin Plans (Central Valley RWQCB 2019; Lahontan RWQCB 2021). If it cannot be avoided, a waterbody's beneficial uses may be affected by the construction, operation, and maintenance of highways and bridges. Impacts on wildlife and aquatic resources can be adverse or beneficial. An example of an adverse impact would be the introduction of a variety of pollutants, including sediments, heavy metals, hydrocarbons, and toxic substances (EPA 2005). An example of a beneficial impact would be repairs or retrofits that improve permeability or flows. Therefore, this RAMNA considers beneficial uses identified for waterbodies located in the GAI relevant to the RAMNA when they support the preservation and enhancement of wildlife habitat and aquatic resources, and are consistent with the AMP's objective to protect natural resources through transportation project mitigation (Table 2-4).

Table 2-4. Beneficial Uses

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

Sources: Central Valley RWQCB (2019); Lahontan RWQCB (2021)

^a Beneficial uses are relevant to the RAMNA when they support the preservation and enhancement of wildlife habitat and aquatic resources, and are consistent with the AMP's objective to protect natural resources through transportation project mitigation.

Through habitat and other improvements, advance mitigation projects have the potential to contribute to compliance with the 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 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 as well as improved water quality.

The CWA Section 303(d) list of impaired waters includes 48 waterbodies in the GAI (SWRCB 2021). This RAMNA considers a waterbody'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.

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, are 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 Merced River, Deadman Creek, Glass Creek, and Tuolumne River are nationally designated wild and scenic rivers in the GAI (National Wild and Scenic Rivers System 2016; Omnibus Public Land Management Act of 2009) (Figure 2-13). On November 2, 1987, and October 23, 1992, Congress designated the Merced River, including the South Fork Merced River, from its source in Yosemite National Park to Lake McClure, with 71 miles as wild, 16 miles as scenic, and 35.5 miles as recreational. On March 30, 2009, Congress designated Deadman Creek from the two-forked source east of San Joaquin Peak to 100 feet upstream of Big Springs and Glass Creek from the two-forked source to its confluence with Deadman Creek, with 6.3 miles as wild, 6.6 miles as scenic, and 6.2 miles as recreational. On September 28, 1984, Congress designated the Tuolumne River main stem from its headwaters to the Don Pedro Reservoir, with 47 miles as wild, 23 miles as scenic, and 13 miles as recreational (National Wild and Scenic River Systems 2016). The locations of these nationally designated wild and scenic rivers are provided on Figure 2-13. No state designated wild and scenic rivers are 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 that may be subject to CDFW, FWS, and/or NMFS regulations. 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. The Water Boards’ jurisdiction includes any activity that may cause a discharge of waste to waters of the state, including WOTUS, rivers, streams, and lakes; 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;³ and deposit or dispose of material into any river, stream, or lake.

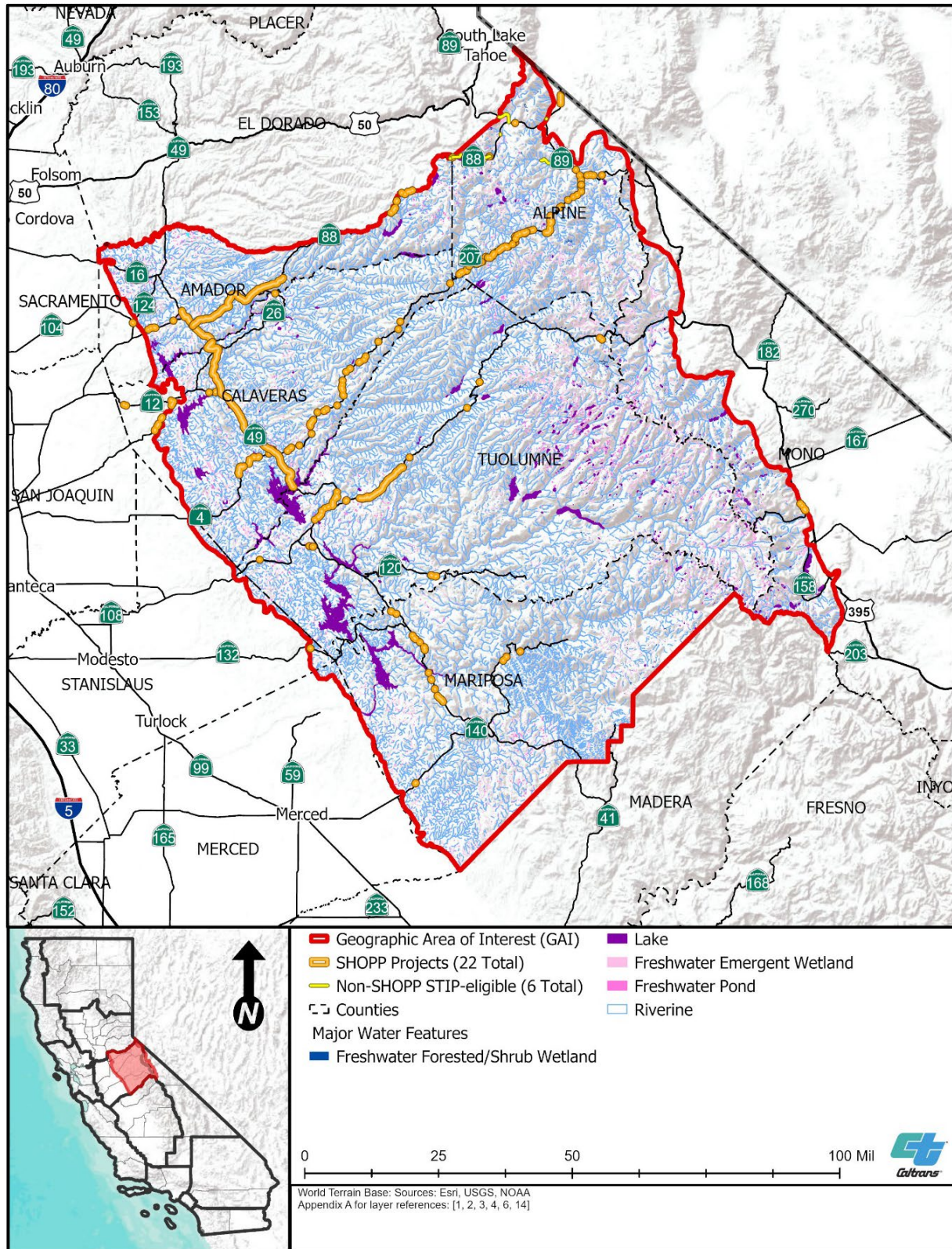
2.15.1. Historical Context

Historically, the abundant streams throughout the Sierra Nevada range were used by Native Americans with little impacts on hydrology. Most of the impacts on 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 used for hydroelectricity, and old mining waterways and structures were replaced with more substantial concrete infrastructure. 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 as well as degradation of streams and aquatic habitat. Additionally, 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, eventually joining the Sacramento River at the Sacramento-San Joaquin Delta. Water is also used 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 as well as portions of the Bay Area (Water Education Foundation 2022).

³ Rivers, streams, and lakes include ephemeral, intermittent, and perennial watercourses.

Figure 2-14. Aquatic Resource Features and Major Stream System



^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. 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 2018, 2023f). 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*)
- state threatened longfin smelt (*Spirinchus thaleichthys*)
- federally and state endangered Mohave tui chub (*Siphateles bicolor mohavensis*)
- federally and state endangered Owens pupfish (*Cyprinodon radiosus*)
- federally threatened Paiute cutthroat trout (*O. clarkii seleniris*)
- federally threatened steelhead – California Central Valley DPS (*O. mykiss*)

However, three of these species do not occur in the GAI: longfin smelt (occurs west of the GAI), Mojave tui chub (occurs south of the GAI), and Owens pupfish (occurs east of the GAI). 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. Paiute cutthroat trout currently occupies the Silver King Creek watershed and its tributaries in the headwaters of the East Fork Carson River drainage. Steelhead currently occurs within the Calaveras, Merced, Mokelumne, Stanislaus, and Tuolumne Rivers.

Although it is the best information currently available, the SAMNA Reporting Tool's fish species list is uncertain (Caltrans 2023f). Therefore, 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 SFEI (2018) California Aquatic Resource Inventory (Table 2-5; Appendix G; Caltrans 2023g). 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 are therefore 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 Sections 401 and 404 of the CWA, the Water Boards and Corps consider wetlands to be jurisdictional WOTUS/Waters of the

State only if they have the three parameters of hydrology, hydrophytic vegetation, and hydric soils as well as 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* (Federal Geographic Data Committee 2013). 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 2023g).

Vernal Pools

Vernal pools do not have a continuous surface connection to a relatively permanent water source but may still be considered jurisdictional Waters of the State pursuant to the Porter-Cologne Act. The SAMNA Reporting Tool's wetland layer does not include vernal pools. However, potential vernal pool habitat can be inferred from the modeled vernal pool fairy shrimp and vernal pool tadpole shrimp habitat developed for the SAMNA that is based on CNDDDB vernal pool species occurrences. Vernal pools mapped using CDFW's ACE vernal pools layer [ds2732] are shown on the left side of Figure 2-15, and the CNDDDB 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 2023h). 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 2023h).

Figure 2-15. Vernal Pools

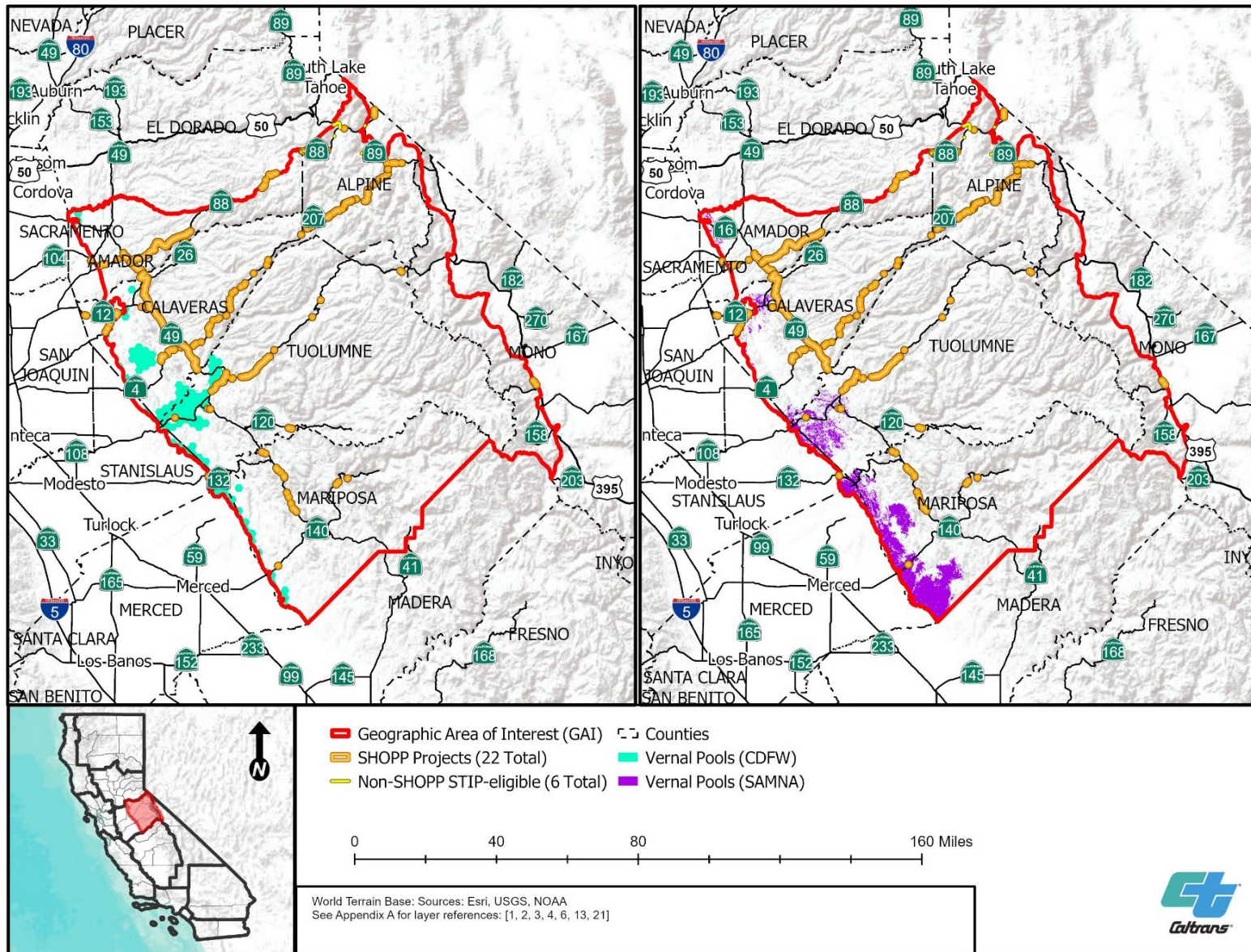


Table 2-5. Wetland and Non-Wetland Water Types in the GAI

Type	Crowley (acres) 18090102	East Walker (acres) 16050301	Fresno River (acres) 18040007	Lake Tahoe (acres) 16050101	Middle San Joaquin- Lower Chowchilla (acres) 1040001	Mono Lake (acres) 18090101	Rock Creek-French Camp Slough (acres) 18040051	South Fork American (acres) 18020129	Upper Calaveras California (acres) 18040011	Upper Carson (acres) 16050201	Upper Cosumnes (acres) 18040013	Upper Merced (acres) 18040008	Upper Mokelumne (acres) 18040012	Upper San Joaquin (acres) 18040006	Upper Stanislaus (acres) 18040010	Upper Tuolumne (acres) 18040009	West Walker (acres) 1605302	Total ^a (acres)
Depressional	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	Not mapped	Not mapped	Not mapped	Not mapped	0.1
Depressional Forested	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	0.3	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	0.3
Depressional Natural Non-vegetated	Not mapped	Not mapped	Not mapped	3.7	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	3.7
Depressional Natural Vegetated	Not mapped	Not mapped	Not mapped	2.9	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	3.0
Depressional Natural Emergent	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	<0.1	Not mapped	<0.1	<0.1	<0.1	<0.1
Depressional Perennial Natural Non-Vegetated	<0.1	<0.1	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	Not mapped	0.2	<0.1	Not mapped	<0.1	1.3	<0.1	1.4
Depressional Perennial Natural Shrub-Scrub	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1
Depressional Perennial Natural Vegetated	Not mapped	<0.1	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	<0.1
Depressional Perennial Non-Vegetated	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	19.4	Not mapped	Not mapped	90.0	16.2	Not mapped	36.8	14.2	Not mapped	176.7
Depressional Perennial Unnatural Emergent	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	Not mapped	<0.1	<0.1	Not mapped	<0.1
Depressional Perennial Unnatural Non-vegetated	Not mapped	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	Not mapped	<0.1	<0.1	0.1	<0.1	<0.1	Not mapped	<0.1	<0.1	Not mapped	0.1

Type	Crowley (acres) 18090102	East Walker (acres) 16050301	Fresno River (acres) 18040007	Lake Tahoe (acres) 16050101	Middle San Joaquin- Lower Chowchilla (acres) 1040001	Mono Lake (acres) 18090101	Rock Creek-French Camp Slough (acres) 18040051	South Fork American (acres) 18020129	Upper Calaveras California (acres) 18040011	Upper Carson (acres) 16050201	Upper Cosumnes (acres) 18040013	Upper Merced (acres) 18040008	Upper Mokelumne (acres) 18040012	Upper San Joaquin (acres) 18040006	Upper Stanislaus (acres) 18040010	Upper Tuolumne (acres) 18040009	West Walker (acres) 1605302	Total ^a (acres)
Depressional Perennial Unnatural Shrub-Scrub	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	Not mapped	Not mapped	Not mapped	<0.1
Depressional Perennial Unnatural Vegetated	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1
Depressional Seasonal	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	0.8	Not mapped	0.6	Not mapped	Not mapped	1.4
Depressional Seasonal Natural Emergent	<0.1	2.2	<0.1	Not mapped	0.2	8.5	<0.1	0.7	<0.1	0.7	9.3	18.1	<0.1	Not mapped	1.1	47.9	<0.1	88.7
Depressional Seasonal Natural Forested	<0.1	<0.1	Not mapped	Not mapped	<0.1	<0.1	<0.1	Not mapped	<0.1	<0.1	Not mapped	21.6	<0.1	Not mapped	<0.1	<0.1	<0.1	21.6
Depressional Seasonal Natural Non- Vegetated	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	<0.1	Not mapped	<0.1
Depressional Seasonal Natural Shrub- Scrub	<0.1	<0.1	<0.1	Not mapped	0.6	0.2	<0.1	3.0	<0.1	0.1	0.5	1.7	1.4	Not mapped	<0.1	2.8	<0.1	10.2
Depressional Seasonal Unnatural Emergent	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	Not mapped	<0.1	<0.1	<0.1	<0.1
Depressional Seasonal Unnatural Forested	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

Type	Crowley (acres) 18090102	East Walker (acres) 16050301	Fresno River (acres) 18040007	Lake Tahoe (acres) 16050101	Middle San Joaquin- Lower Chowchilla (acres) 1040001	Mono Lake (acres) 18090101	Rock Creek-French Camp Slough (acres) 18040051	South Fork American (acres) 18020129	Upper Calaveras California (acres) 18040011	Upper Carson (acres) 16050201	Upper Cosumnes (acres) 18040013	Upper Merced (acres) 18040008	Upper Mokelumne (acres) 18040012	Upper San Joaquin (acres) 18040006	Upper Stanislaus (acres) 18040010	Upper Tuolumne (acres) 18040009	West Walker (acres) 1605302	Total ^a (acres)
Depressional Seasonal Unnatural Non- vegetated	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	Not mapped	<0.1	<0.1	Not mapped	<0.1
Depressional Seasonal Unnatural Shrub-Scrub	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	<0.1	Not mapped	<0.1
Freshwater Emergent Wetland	88.1	992.2	80.4	204.1	812.4	1,946.4	739.4	329.3	493.6	5,091.1	644.9	3,695.8	2,256.1	0.2	4,588.8	12,769.7	3,118.6	37,851.1
Freshwater Forested/ Shrub Wetland	85.1	862.5	25.4	123.4	229.7	929.4	26.2	225.1	520.1	3,014.6	69.7	2,218.4	1,773.8	Not mapped	3,306.6	4,532.8	1,299.2	19,242.0
Freshwater Pond	0.2	126.3	4.7	17.1	708.7	139.6	231.8	87.4	394.7	209.8	268.0	308.5	563.8	0.3	785.1	2,236.3	213.9	6,296.4
Lacustrine Natural Non-vegetated	Not mapped	<0.1	Not mapped	0.9	Not mapped	<0.1	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	10.3	Not mapped	Not mapped	<0.1	<0.1	<0.1	11.2
Lacustrine Natural Vegetated	Not mapped	Not mapped	Not mapped	0.7	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	0.7
Lacustrine Unnatural	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	11.6	Not mapped	Not mapped	11.6
Lacustrine Unnatural Non-vegetated	Not mapped	Not mapped	Not mapped	Not mapped	103.0	<0.1	<0.1	Not mapped	<0.1	<0.1	Not mapped	<0.1	<0.1	Not mapped	<0.1	<0.1	<0.1	103.0
Lake	Not mapped	1,178.1	Not mapped	0.6	Not mapped	3,469.1	840.0	1,205.1	3,642.1	396.9	Not mapped	7,479.6	5,697.7	Not mapped	14,755.0	21,896.3	355.2	60,915.7
Riverine	80.6	461.4	83.6	14.5	2,513.4	474.5	553.6	99.7	1,960.5	1,654.2	445.5	4,359.6	4,035.5	Not mapped	5,190.2	7,116.0	743.0	29,785.8
Slope	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	<0.1
Slope Natural	Not mapped	Not mapped	Not mapped	15.2	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	0.2	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	15.4
Slope Natural Forested	Not mapped	Not mapped	Not mapped	71.4	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	71.4

Type	Crowley (acres) 18090102	East Walker (acres) 16050301	Fresno River (acres) 18040007	Lake Tahoe (acres) 16050101	Middle San Joaquin- Lower Chowchilla (acres) 1040001	Mono Lake (acres) 18090101	Rock Creek-French Camp Slough (acres) 18040051	South Fork American (acres) 18020129	Upper Calaveras California (acres) 18040011	Upper Carson (acres) 16050201	Upper Cosumnes (acres) 18040013	Upper Merced (acres) 18040008	Upper Mokelumne (acres) 18040012	Upper San Joaquin (acres) 18040006	Upper Stanislaus (acres) 18040010	Upper Tuolumne (acres) 18040009	West Walker (acres) 1605302	Total ^a (acres)
Slope Natural Wet Meadow Herbaceous	Not mapped	Not mapped	Not mapped	62.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	0.02	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	62.1
Total ^b	254	3,623	194	517	4,368	6,968	2,391	1,951	7,031	10,368	1,438	18,204	14,345	0.5	28,676	48,617	5,730	154,674

Sources: Caltrans (2023g, 2023h)
^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.

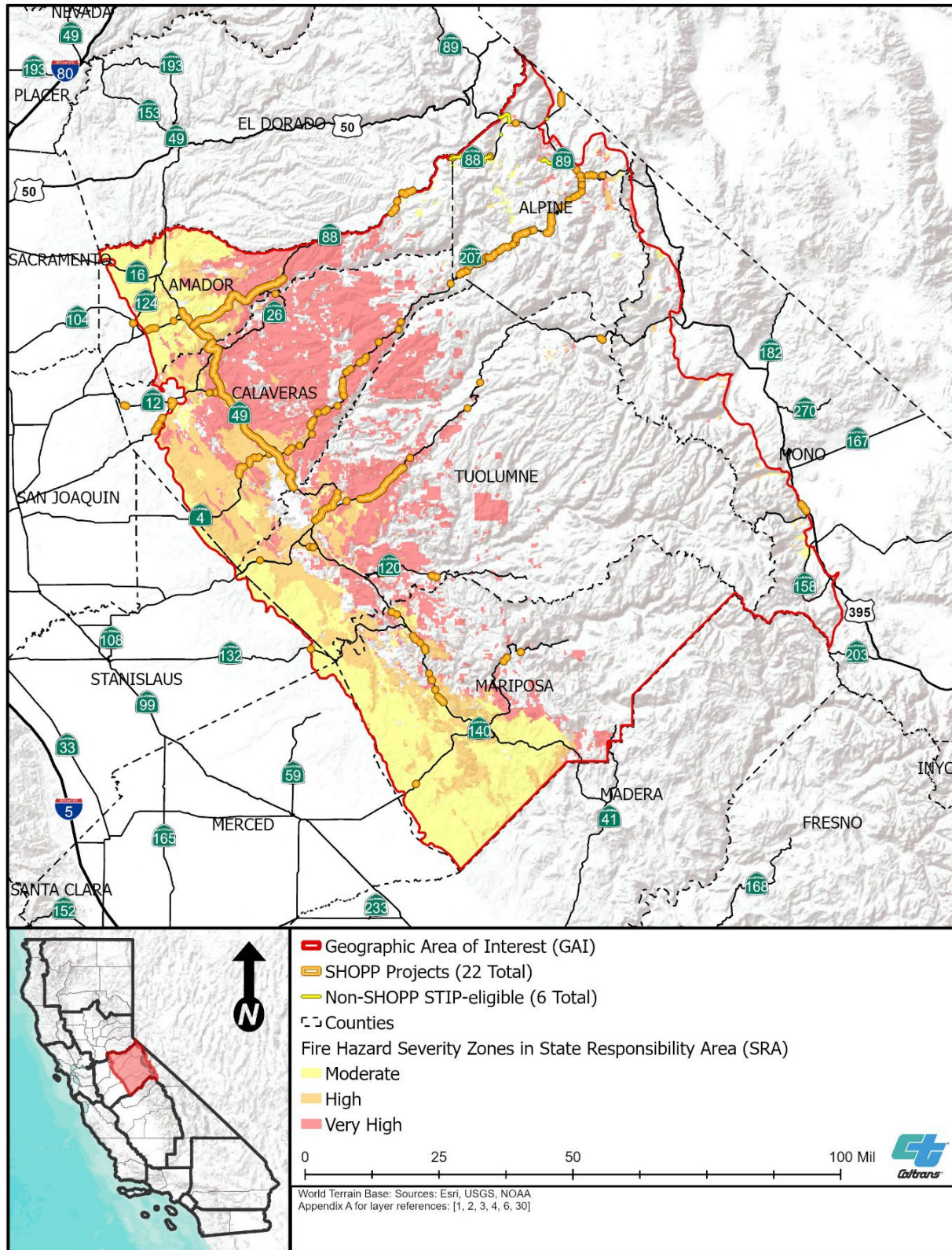
2.16 Riparian Habitat

Riparian habitats may include portions that are wetlands or non-wetland waters, but they also may be outside these categories. These habitats are water-dependent and typically occur along streams and lakes where transitions occur between terrestrial and aquatic parts of a watershed. Riparian habitats may naturally fluctuate because of water levels, geomorphology, or intermixed vegetation types. Within the Sierra Nevada, riparian habitat changes with the elevation and surrounding vegetation communities where there is an obvious contrast between deciduous species in the riparian habitat and the conifers or chaparral on the hillsides. At lower elevations, riparian habitats resemble oasis-like areas in comparison to the surrounding sagebrush and chaparral communities (University of California, Davis, Centers for Wildland Resources 1996).

2.17 Fire Hazard Severity Zones

Cal Fire 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, moderate severity zones are concentrated on the western edge of the GAI, with high and very high zones concentrated in the northwestern portion of the GAI. This information is important for scoping advance mitigation and transportation projects undertaken in 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. Table 3-1 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: reference is complete
 - draft: reference is not complete, and changes may occur when it is finalized
 - in progress: formal draft version has not been completed, and the document is being written
 - in litigation: reference is subject to at least one lawsuit and is not being revised
 - updated periodically: reference is updated with new information on a somewhat frequent basis
 - not publicly available: 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 –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 10 based on the SAMNA results and other information. District 10 specifically identified compensatory mitigation for California red-legged frog, California tiger salamander, foothill yellow-legged frog, Sierra Nevada yellow-legged frog, Western spadefoot, California spotted owl, Central Valley DPS steelhead, Lahontan cutthroat trout, and Paiute cutthroat trout and aquatic resources, including riparian habitat, as historical and anticipated mitigation needs. Therefore, 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 that depend on the same resources for at least part of their life cycle 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
Assembly Bill 1889 Conservation Element: Wildlife and Habitat Connectivity	Updated periodically (by California legislature)	No	Law that requires a conservation element and wildlife connectivity element to be included in city and/or county general plans.	https://legiscan.com/CA/text/AB1889/2023	9/27/2024 (last amended)
Assembly Bill 2344 Wildlife Connectivity: Transportation Projects	Updated periodically (by California legislature)	No	Law that requires the development of an inventory of connectivity needs on the SHS where wildlife passage features could reduce wildlife-vehicle collisions or enhance wildlife connectivity.	https://legiscan.com/CA/text/AB2344/id/2609212	9/30/2022 (last amended)
California Fish and Game Commission Wetlands Resources Policy	Updated periodically	No	California Fish and Game Commission's 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 waterbodies 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
Caltrans Wildlife Connectivity Program Report	Final	Yes	This is a Caltrans' report that identifies currently funded transportation projects with wildlife features that address wildlife connectivity needs. Three actively funded projects and one planned funded project are in the GAI. Three Caltrans priority wildlife connectivity locations in the GAI require funding.	https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/caltrans-wildlife-connectivity-report-ally.pdf	7/1/2024
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 Section 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, it 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, emergencies, and after proper notification to 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

Title	Status	Spatial Data	Reference Purpose	Link	Date
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	Final	No	Implemented by 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, 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/lisa	6/27/2017 (last amended)
Wildlife Connectivity Actions FGC § 1955	Updated periodically (by California legislature)	No	Law that declares the importance for habitat connectivity because of a changing climate and changes in land use across the state.	https://leginfo.ca.gov/faces/codes_displaySection.xhtml?lawCode=FGC&sectionNum=1955	1/1/2022 (last amended)
Fish Passage FGC § 5901	Updated periodically (by California legislature)	No	Law that prohibits constructing or maintaining any device or contrivance that prevents or impedes, or tends to prevent or impede, the passing of fish up- and downstream.	https://california.public.law/codes/fish_and_game_code_section_5901#google_vignette	1/1/2024 (last amended)
Water Quality Control Plan for the Central Valley Region	Updated periodically	Yes	Implemented by Central Valley RWQCB. Establishes general and site-specific water quality standards and objectives in the Sacramento River and San Joaquin Basins.	https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/#basinplans	2/1/2019 (last revision)
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/centralvalley/water_issues/programs/basin_plan/	9/22/2021 (last updated)
Federal Laws, Guidelines, and Regulations	See below	See below	See below	See below	See below
12501-SPD Standard Operating Procedure for Determining Mitigation Ratios	Updated periodically	No	Corps' guidance document to establish processes for determining compensatory mitigation requirements as required for processing permits under Section 404 of the CWA; Section 10 of the Rivers and Harbors Act; and Section 103 of the Marine Protection, Research, and Sanctuaries Act.	https://www.spd.usace.army.mil/Missions/Regulatory/Public-Notices-and-References/Article/487060/12501-spd/	3/05/2021 (last updated)
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 waterbodies.	https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml	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/utis/getfile/collection/p16021coll9/id/1473	9/25/2018
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)

Title	Status	Spatial Data	Reference Purpose	Link	Date
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 Municipal Separate Storm Sewer System 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 that 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 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)
FESA	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 as well as preserve and enhance the natural and beneficial values of wetlands.	https://www.epa.gov/cwa-404/protection-wetlands-executive-order-11990	3/24/1977
Federal Climate Action Plans	Updated periodically	No	Federal government action plans 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 Corps and EPA.	https://www.sustainability.gov/federaalsustainabilityplan	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)
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 set forth the no net loss policy.	https://www.epa.gov/cwa-404/national-wetlands-mitigation-action-plan	12/26/2002
The Navigable Waters Protection Rule	In progress	No	The navigable waters protection rule, dated April 21, 2020, has been vacated by the court, and implementation has been halted. Rulemakings to revise the rule are currently in progress.	https://www.epa.gov/nwpr/final-rule-navigable-waters-protection-rule	6/9/2021 (announcement of rulemaking process)
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://www.fws.gov/story/2009-09/rising-challenge-strategic-plan-responding-accelerating-climate-change	9/1/2010
Secretarial Order 3362: Improving Habitat Quality in Western Big-Game Winter Range and Migration Corridors	Updated periodically	No	U.S. Department of the Interior's order to enhance and improve the quality of big-game winter range and migratory corridor habitat on federal lands under management jurisdiction of the Department of the Interior. The GAI includes a priority area identified for mule deer by this order.	https://www.doi.gov/sites/doi.gov/files/uploads/so_3362_migration.pdf	2/1/2018
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 waterbody. 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)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Section 14 of the Rivers and Harbors Appropriation Act of 1899	Updated periodically (by Congress)	No	Implemented by EPA and 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 around goals such as biodiversity conservation, habitat connectivity, and climate change resiliency.	https://wildlife.ca.gov/Data/Analysis/ACE	7/10/2019 (last updated)
California Biodiversity Initiative	Final	No	A CNRA, California Department of Food and Agriculture, and Governor's Office of Planning and Research high-level planning document. Provides a roadmap to secure California's biodiversity future.	https://californiabiodiversityinitiative.org/pdf/california-biodiversity-action-plan.pdf	9/1/2018
California Essential Habitat Connectivity Project	Final	Yes	CDFW and Caltrans assessment to identify large remaining blocks of intact habitat or natural landscape and to 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/hwp/watershed-protection-projects-state-and-region	5/1/2005
Preliminary Healthy Watersheds Assessments	Updated periodically	Yes	EPA's guidance and information related to watershed assessments in California.	https://www.epa.gov/hwp/preliminary-healthy-watersheds-assessments	5/12/2026
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 California red-legged frog and California tiger salamander.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=204648&inline	12/1/2022
Caltrans Adaptation Strategies Report: District 10	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/-/media/dot-media/programs/transportation-planning/documents/2020-adaption-priorities-reports/d10-adaptation-priorities-report-2021-a11y.pdf	12/1/2020
Caltrans Climate Change Vulnerability Assessment, District 10 Technical Report	Final	No	Caltrans' assessment of climate change vulnerabilities for the District.	https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/2019-climate-change-vulnerability-assessments/ada-remediated/d10-technical-report-a11y.pdf	11/21/2019

Title	Status	Spatial Data	Reference Purpose	Link	Date
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' 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	CNRA's conservation plan. 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. Includes conservation strategies for both Lahontan cutthroat trout and Paiute cutthroat trout.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=110399&inline https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=110402&inline	9/1/2015
SWAP Transportation Companion Plan	Final	Yes	CDFW's companion document to SWAP for protection of species specific to transportation project planning.	https://swap.wildlife.ca.gov/conservation-tools/#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://cawaterlibrary.net/wp-content/uploads/2017/06/Water_CP_Final_December_2016.pdf	12/1/2016
Special-status Taxa^a Documents	See below	See below	See below	See below	See below
Recovery Plan for the California Red-legged Frog (<i>Rana aurora draytonii</i>)	Final	Yes	FWS' recovery plan for California red-legged frog occurring in the GAI. The recovery criteria that must be achieved before delisting can occur are: - All suitable habitats in Core Areas (3 of 35 are in the GAI) are protected in perpetuity, and the ecological integrity of these areas is not threatened. - Existing populations throughout the range are stable, and they are geographically distributed in a manner that allows for the continued existence of viable metapopulations despite subpopulation fluctuations. - There is successful reestablishment in portions of its historic range such that at least one reestablished population is stable/increasing in each core area where frogs are currently absent. The amount of additional habitat needed for population connectivity, recolonization, and dispersal has been determined, protected, and managed for the California red-legged frog.	https://ecos.fws.gov/ecp/species/2891	5/28/2002
California Red-legged Frog 5-Year Review	Updated periodically	No	FWS' 5-Year review for California red-legged frog.	https://ecos.fws.gov/ecp/species/2891	12/16/2022 (latest document)
Critical Habitat Designation for the California Red-legged Frog	Final	Yes	FWS' designation of critical habitat for the California red-legged frog.	https://ecos.fws.gov/ecp/species/2891	4/13/2006
California Red-legged Frog Biological Opinions	Updated periodically	No	FWS' list of 324 biological opinions that have been used for California red-legged frog; of these, 8 occur in the GAI.	https://ecos.fws.gov/ecp/species/2891	6/4/2024 (latest document)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Recovery Plan for the Central California DPS of the California Tiger Salamander (<i>Ambystoma californiense</i>)	Final	No	FWS' recovery plan for the central California DPS of California tiger salamander. It identifies the following actions needed to recover this species: ▪ maintain current distribution of species, ▪ maintain native genetic structure across the species range, ▪ minimize road mortality, ▪ minimize potential for disease introduction, ▪ minimize non-native predator populations, and ▪ ensure adaptive management and monitoring of habitat and conduct research.	https://ecos.fws.gov/ecp/species/2076	6/6/2017
5-Year Review California Tiger Salamander Central California DPS (<i>Ambystoma californiense</i>)	Updated periodically	Yes	FWS' most recent review of the condition of the central California DPS of the California tiger salamander.	https://ecos.fws.gov/ecp/species/2076	8/10/2023 (latest document)
Critical Habitat Designation for the California Tiger Salamander, Central Population	Final	Yes	FWS' designation of critical habitat for the California tiger salamander central California DPS.	https://ecos.fws.gov/ecp/species/2076	8/23/2005
California Tiger Salamander Biological Opinions	Updated periodically	Yes	FWS' list of the 168 most recent biological opinions that have been issued for the California tiger salamander; of these, 5 occur in the GAI.	https://ecos.fws.gov/ecp/species/2076	6/4/2024 (latest document)
Incidental Take Permits for California Tiger Salamander	Updated periodically	No	CDFW's list of incidental take permits issued for the California tiger salamander from its publicly available document search website. There are 211 documents in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	4/3/2023 (latest document)
Interim Guidance on Site Assessment and Field Surveys for Determining Presence or a Negative Finding of the California Tiger Salamander	Draft	No	CDFW's 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
Foothill Yellow-legged Frog Recovery Outline	Draft	No	FWS' recovery outline for the foothill yellow-legged frog. The South Sierra DPS is the only DPS for this species in the GAI. Suggested recovery plan goals include: ▪ enhance occupied habitat to increase abundance and connectivity, and ▪ augment existing populations to enhance resiliency and redundancy.	https://ecos.fws.gov/ecp/species/D02G	9/29/2023
Species Status Assessment Report for the Foothill Yellow-legged Frog (<i>Rana boylei</i>)	Final	Yes	FWS' assessment of the condition of the foothill yellow-legged frog before it became a listed species.	https://ecos.fws.gov/ecp/species/D02G	4/19/2023
Critical Habitat Designation for the Foothill Yellow-legged Frog	Final	No	Critical habitat for this species has not been designated.	https://ecos.fws.gov/ecp/species/D02G	8/15/2024 (last reviewed)
Foothill Yellow-legged Frog Biological Opinions	Updated periodically	No	FWS' list of 11 biological opinions that have been issued for the foothill yellow-legged frog; of these, 3 occur in the GAI.	https://ecos.fws.gov/ecp/species/5133#bo	6/4/2024 (latest document)
A Status Review of the Foothill Yellow-legged Frog (<i>Rana boylei</i>) in California	Final	No	CDFW's status review of the foothill yellow-legged frog.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=174663&inline	9/20/2019
Considerations for Conserving the Foothill Yellow-Legged Frog	Final	No	CDFW's document outlining considerations for conservation of the foothill yellow-legged frog.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=157562&inline	5/14/2018
Incidental Take Permits for Foothill Yellow-legged Frog	Periodically updated	No	CDFW's list of incidental take permits issued for the foothill yellow-legged frog from its publicly available document search website; 17 documents were found in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	6/5/2024 (latest document)
Recovery Plan for the Sierra Nevada Yellow-legged Frog (<i>Rana sierrae</i>)	Not applicable	No	FWS has not developed a recovery plan for this species.	https://ecos.fws.gov/ecp/species/9529	Not applicable

Title	Status	Spatial Data	Reference Purpose	Link	Date
Endangered and Threatened Wildlife and Plants; Initiation of 5-Year Status Reviews of 66 Species in California and Nevada	Updated periodically	No	FWS' 5-Year review for Sierra Nevada yellow-legged frog.	https://ecos.fws.gov/ecp/species/9529	1/27/2020 (latest document)
Critical Habitat Designation for the Sierra Nevada Yellow-legged Frog	Final	Yes	FWS' designation of critical habitat for the Sierra Nevada yellow-legged frog.	https://ecos.fws.gov/ecp/species/9529	8/26/2016
Sierra Nevada Yellow-legged Frog Biological Opinions	Updated periodically	No	FWS' list of 46 biological opinions that have been issued for the Sierra Nevada yellow-legged frog; of these, 18 occur in the GAI.	https://ecos.fws.gov/ecp/species/9529	3/27/2024 (latest document)
Evaluation of Petition from the Center for Biological Diversity to List All Populations of the Mountain Yellow-legged Frog (<i>Rana muscosa</i> and <i>Rana sierrae</i>) as Endangered	Final	No	Petition from the Center for Biological Diversity to list all populations of the mountain yellow-legged frogs as endangered.	https://wildlife.ca.gov/Conservation/Amphibians	6/22/2010
Incidental Take Permits for Sierra Nevada Yellow-legged Frog	Periodically updated	No	CDFW's list of incidental take permits issued for the Sierra Nevada yellow-legged frog from its publicly available document search website; 5 documents were found in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	2/14/2023 (latest document)
Species Status Assessment Report for Western Spadefoot (<i>Spea hammondi</i>)	Updated periodically	No	FWS' species status assessment for the western spadefoot.	https://ecos.fws.gov/ecp/species/5425	9/29/2023 (latest document)
Endangered and Threatened Wildlife and Plants; Threatened Status with Section 4(d) Rule for the Northern and Southern Distinct Population Segments of the Western Spadefoot	Final	No	FWS' proposed ruling to list the northern and southern DPSs of western spadefoot as threatened.	https://ecos.fws.gov/ecp/species/5425	12/5/2023
Species Status Assessment Report for the California Spotted Owl (<i>Strix occidentalis occidentalis</i>)	Updated periodically	No	FWS' species status assessment for the California spotted owl.	https://ecos.fws.gov/ecp/species/7266	1/9/2023 (latest document)
Endangered and Threatened Wildlife and Plants; California Spotted Owl; Endangered Status for the Coastal Southern California Distinct Population Segment and Threatened Status with Section 4(d) Rule for the Sierra Nevada Distinct Population Segment	Final	No	FWS' proposed ruling to list the Coastal-Southern California DPS as endangered and the Sierra Nevada DPS as threatened.	https://ecos.fws.gov/ecp/species/7266	2/23/2023
Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the DPS of California Central Valley Steelhead	Final	Yes	NMFS' recovery plan for California Central Valley DPS of steelhead. The recovery criteria that must be achieved before delisting can occur are based on a complex formula of population levels in different diversity groups, as explained in detail in Section 4.0 of the recovery plan.	https://www.fisheries.noaa.gov/resource/document/recovery-plan-evolutionarily-significant-units-sacramento-river-winter-run	7/1/2014
Central Valley Recovery Domain 5-Year Review: Summary and Evaluation California Central Valley Steelhead Distinct Population Segment	Updated periodically	Yes	NMFS' most recent formal review of the species' DPS condition.	https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/california-central-valley-steelhead	5/5/2016

Title	Status	Spatial Data	Reference Purpose	Link	Date
Designation of Critical Habitat for Seven Evolutionary Significant Units of Pacific Salmon and Steelhead in California	Final	No	NMFS' designation of critical habitat for steelhead.	https://www.fisheries.noaa.gov/action/designation-critical-habitat-7-evolutionarily-significant-units-pacific-salmon-and-steelhead	9/2/2005
Biological Opinions for Steelhead	Updated periodically	No	A search of NMFS' environmental consultation organizer for biological opinions for steelhead resulted in 66 documents. Of these, 41 are letters of concurrence, of which 15 are for actions that occur in the GAI. Of the remaining documents, 10 biological opinions are for actions that occur in the GAI. Additionally, a search of NOAA's Repository for Biological Opinions for steelhead resulted in 640 documents.	https://appscloud.fisheries.noaa.gov/suite/sites/public/page/search	1/8/2024 (latest document)
Steelhead Restoration and Management Plan for California	Final	Yes	CDFW's restoration and management plan for steelhead throughout the state. There are separate management objectives for three designated management areas: North Coast, Central Valley and South Coast, of which the Central Valley management area occurs in the GAI. This plan includes stream-specific recommendations pertaining to the Mokelumne River and the San Joaquin River and its tributaries.	https://www.google.com/url?client=internal-element-cse&cx=003744124407919529812:v2-t3gqht48&q=https://nrm.dfg.ca.gov/FileHandler.ashx%3FDocumentID%3D3490&sa=U&ved=2ahUKEwj1156Uz_fmAhXSHc0KHcG_CfY4ChAWMAB6BAgGEAE&usq=AOvVaw1GUboKPeGb7OoSOIk c7IH7	2/1/1996
Incidental Take Permits for California Steelhead	Final	No	CDFW's list of incidental take permits issued for California steelhead from its publicly available document search website; 20 documents were found in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	1/5/2023 (latest document)
Lahontan Cutthroat Trout (<i>Oncorhynchus clarki henshawi</i>) Recovery Plan	Final	No	FWS' recovery plan for Lahontan cutthroat trout. The recovery criteria that must be achieved before delisting can occur are based on management practices to enhance and protect habitat for self-sustaining populations, which have complicated components and are outlined in Part II of the recovery plan.	https://ecos.fws.gov/ecp/species/3964	1/30/1995
Status Review: Lahontan Cutthroat Trout (<i>Oncorhynchus clarkii henshawi</i>)	Updated periodically	Yes	FWS' most recent formal review of the subspecies' condition.	https://ecos.fws.gov/ecp/species/3964	2/24/2023 (latest document)
Critical Habitat Designation for the Lahontan Cutthroat Trout	Not applicable	No	Critical habitat for this species has not been designated.	https://ecos.fws.gov/ecp/species/3964	Not applicable
Lahontan Cutthroat Trout Biological Opinions	Updated periodically	Yes	FWS' list of 59 biological opinions that have been issued for the Lahontan cutthroat trout; of these, 3 occur near the GAI.	https://ecos.fws.gov/ecp/species/3964	3/27/2024 (latest document)
Revised Recovery Plan for the Paiute Cutthroat Trout (<i>Oncorhynchus clarkii seleniris</i>)	Final	No	FWS' recovery plan for Paiute cutthroat trout. The recovery criteria that must be achieved before delisting can occur are based on management of non-native salmonid species and habitat improvement, which have complicated components and are outlined in Part II of the recovery plan.	https://ecos.fws.gov/ecp/species/6890	9/10/2004
Paiute Cutthroat Trout 5-Year Review: Summary and Evaluation	Updated periodically	Yes	FWS' most recent formal review of the subspecies' condition.	https://ecos.fws.gov/ecp/species/6890	9/29/2020 (latest document)
Critical Habitat Designation for the Paiute Cutthroat Trout	Final	No	Critical habitat for this species has not been designated.	https://ecos.fws.gov/ecp/species/6890	8/27/2024 (last reviewed)
Paiute Cutthroat Trout Biological Opinions	Updated periodically	Yes	FWS' list of 3 biological opinions that have been issued for the Paiute cutthroat trout; of these, 2 occur near the GAI.	https://ecos.fws.gov/ecp/species/6890	2/13/2023 (latest document)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon	Final	Yes	FWS recovery plan for vernal pool species in California and Oregon, which includes 25 plants, 7 invertebrates, and 1 amphibian, for a total of 33 species. In general, recovery criteria center on habitat protection and adaptive habitat management, which includes developing management plans, conducting status surveys, 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. Sixteen regions are identified in this plan, along with 41 core areas.	https://ecos.fws.gov/docs/recovery_plan/Vernal%20Pool%20Ecosystem%20Final%20Recovery%20Plan.pdf	12/15/2005
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 require an inventory of known natural resources and general guidelines to comply with federal and state laws. State park entities in the GAI that have management plans are listed below.	http://www.parks.ca.gov/pages/21299/files/planning_handbook_april_2010.pdf	4/1/2010
Calaveras Big Trees State Park Preliminary General Plan	Final	No	California State Parks' management plan for Calaveras Big Trees State Park. Includes goal to restore wetland meadows and remove campsites near the North Grove.	https://www.parks.ca.gov/?page_id=24354	5/1/1989
Columbia State Historic Park General Development Plan	Final	No	California State Parks' management plan for Columbia State Historic Park.	https://www.parks.ca.gov/?page_id=24355	1/1/1979
Grover Hot Springs State Park Master Plan Study	Final	No	California State Parks' management plan for Grover Hot Springs State Park.	https://www.parks.ca.gov/?page_id=24357	3/1/1962
Indian Grinding Rock State Historic Park General Plan	Final	No	California State Parks' management plan for Indian Grinding Rock State Historic Park.	https://www.parks.ca.gov/?page_id=24358	6/1/1984
Updated Land Management Plan for California Department of Fish and Game's Heenan Lake Wildlife Area	Final	Yes	California Fish and Game's management plan for Heenan Lake Wildlife Area. It includes goals to minimize impacts to existing species through enhancement and protection of habitat.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=84914&inline	9/1/2007
FWS Land Management Plans	See below	See below	See below	See below	See below
Not applicable	Not applicable	Not applicable	No national wildlife refuges occur in the GAI.	Not applicable	Not applicable
U.S. Bureau of Reclamation	See below	See below	See below	See below	See below
Record of Decision. Reinitiation of Consultation on the Coordinated Long-Term Modified Operations of the Central Valley Project and State Water Project	Final	No	The Bureau of Reclamations' record of decision regarding consulting with FWS and NMFS on operations of the Central Valley Project and State Water Project. Includes a goal to conduct additional restoration at several locations on the Stanislaus River.	This document is no longer publicly available	2/1/2020
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	Although the California Valley Miwok Tribe, Jackson Rancheria of Me-Wuk Indians, and Tuolumne Band of Me-Wuk Indian Nations occur in the GAI, these nations do not appear to have a publicly available land management plan pertinent to this RAMNA.	Not applicable	Not applicable

Title	Status	Spatial Data	Reference Purpose	Link	Date
Chicken Ranch Rancheria 2020 Wetland Program Plan	Final	No	Chicken Ranch Rancheria of Me-wuk Indians of California's programmatic plan for monitoring and protecting wetlands on Chicken Ranch Rancheria Reservation lands. Includes a general goal to restore wetland habitat.	https://www.epa.gov/sites/default/files/2021-03/documents/chicken_ranch_rancheria_wetland_program_plan_signed_2021.pdf	1/21/2020
Washoe Tribe of Nevada and California Integrated Resource Management Plan	Final	Yes	Washoe Tribe of Nevada and California's integrated resource management plan. Includes a general goal to eradicate tamarisk from riparian woodlands. This document does not appear to be publicly available anymore.	https://www.bing.com/ck/a?!&p=4ea9b7657e20a41ead6dc28a38f73303e82618d54645cf864a407a2ba3e3998bJmItdHM9MTc4Mjk1MDQwMA&ptn=3&ver=2&hsh=4&fclid=13c6dc71-8d58-6d6f-2204-ca848c496c97&psq=Washoe+Tribe+Integrated+Resource+Management+Plan&u=a1aHR0cHM6Ly93YXNob2V0cmliZS51cy9kb2N1bWVudHMvODgvMjAwOF9XYXNob2VfVHJpYmVfSVJNUC1fY29tcHJlaGVuc2l2ZV9sYW5kX3VzZV9wbGFuLnBkZg	12/11/2008
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. Includes a general goal to reestablish California spotted owl habitat and a specific goal to restore 10 acres of yellow-legged frog habitat within lakes in the Emigrant Wilderness.	https://www.frames.gov/catalog/15758	1/1/2013
El Dorado National Forest Land and Resource Management Plan	Final	No	USFS' management plan for the El Dorado National Forest.	https://www.fs.usda.gov/r05/eldorado/planning	1/1/1988
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/sites/nfs/files/legacy-media/inyo/Inyo%20NF%20Land%20Managemen%20Plan%20Oct%202019.pdf	9/1/2019
Lake Tahoe Basin Management Unit Land Management Plan	Final	Yes	USFS' management plan for the Lake Tahoe Basin Management Unit. Includes general and specific goals for aquatic habitat restoration. Includes goal to restore seven high alpine lakes (composed of habitat areas that would support four sub-populations) adjacent to current Sierra Nevada yellow-legged frog populations in the Desolation Wilderness by removing introduced trout species by 2029.	https://www.fs.usda.gov/main/lbmu/landmanagement/planning	7/1/2016
Land Management Plan for the Sierra National Forest	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://usfs-public.app.box.com/v/PinyonPublic/file/1224226105088	5/1/2023
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://research.fs.usda.gov/treesearch/40254	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, which include all national forests and management units of the GAI.	https://www.fs.usda.gov/sites/nfs/files/r05/publication/stelprdb5350050-expired-snfpa_vol1.pdf	1/1/2004
Stanislaus National Forest – Forest Plan Direction	Final	Yes	USFS' management plan for the Stanislaus National Forest. Includes general goal to restore ecological function of streams, lakes, wetlands, and wet meadows. Includes standards and guidelines for ground disturbance work within designated buffers of known occupied sites and where suitable habitat occurs for California red-legged frog and mountain yellow-legged frog. Includes standards and guidelines for work in California spotted owl home range core areas and protected activity centers.	https://www.fs.usda.gov/main/stanislaus/landmanagement/planninghttps://www.fs.usda.gov/r05/stanislaus/planning	10/28/1991, and updates

Title	Status	Spatial Data	Reference Purpose	Link	Date
Toiyabe National Forest Land and Resource Management Plan	Final	No	USFS' management plan for the Toiyabe portion of the Humboldt-Toiyabe National Forest. The Humboldt and Toiyabe National Forests were united administratively after this plan was written; however, no comprehensive joint management plan has been written since this occurred. The Humboldt portion of the Humboldt-Toiyabe National Forest is entirely within Nevada. This document includes several goals targeting riparian habitat enhancement.	https://www.fs.usda.gov/sites/nfs/files/r04/humboldt-toiyabe/publication/stelprdb5143054.pdf	1/1/1986
BLM Land Management Plans	See below	See below	See below	See below	See below
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/eplanning-ui/project/70447/510	4/1/1993
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 River System. Dana Fork, Deadman Creek, Glass Creek, Merced River, South Fork Merced River, and Tuolumne River all have national river segments that occur in the GAI.	https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm	12/21/2017
Tuolumne Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement	Final	Yes	NPS' management plan for the wild and scenic portion of the Tuolumne River. The Sierra Nevada yellow-legged frog was documented in the Tuolumne River corridor in 1995 and 1999.	https://www.nps.gov/yose/getinvolved/trp.htm	2/1/2014
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
Not available	Not available	Not available	Not available	Not available	Not available
Water Resources Plans and Documents	See below	See below	See below	See below	See below
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. Western spadefoot, California tiger salamander, and California red-legged frog are listed as target species.	https://cvfpcb.ca.gov/cvfpp/	12/1/2021
Central Valley Project Integrated Resource Plan Final Report	Final	Yes	U.S. Bureau of Reclamation's plan for the water supply of the Central Valley.	https://www.usbr.gov/mp/ssjbasinstudy/docs.html	11/1/2014
American River Basin Integrated Regional Water Management Plan	Updated periodically	Yes	Regional Water Authority's management plan for the plan area, which includes a very small piece of the northwestern corner of the GAI. Includes general goals to improve riparian habitat and reduce invasive species.	https://rwah2o.org/programs/integrated-regional-water-management/american-river-basin-irwmp-2018-update/	5/1/2018
Integrated Regional Water Management Plan Cosumnes American Bear Yuba Watersheds, California	Draft	Yes	Water management plan primarily developed by the Nevada and El Dorado Irrigation Districts as well as the Placer and El Dorado County Water Agencies for the plan area. This document includes multiple detailed aquatic resource goals for the plan area.	http://cabyregion.org/mdocs-posts/2021-caby-plan-update/	1/1/2021 (last updated)

Title	Status	Spatial Data	Reference Purpose	Link	Date
East Stanislaus Integrated Region Water Management Plan	Updated periodically	No	East Stanislaus Regional Water Management Partnerships plan for management of water resources in the plan area, which includes a very small portion of the central-western area of the GAI. The plan includes goals for native habitat restoration, groundwater replenishment, water quality improvement, and flood risk reduction.	http://www.eaststanirwm.org/documents/	2/1/2018 (last updated)
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 as well as a portion of Kern and San Bernardino Counties.	https://inyo-monowater.org/our-work/inyo-mono-irwm-plan/	9/25/2019 (last updated)
2018 Merced Integrated Regional Water Management Plan Update	Updated periodically	No	Merced Integrated Regional Water Management Authority's plan for the management of water resources in Merced County. The plan includes goals for native habitat restoration, groundwater replenishment, water quality improvement, and flood risk reduction. This plan covers a very small portion of the southwestern corner of the GAI.	https://mercedirwmp.org/documents.html	2/1/2019 (last updated)
Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update	Updated periodically	Yes	Upper Mokelumne River Watershed Authority's plan for the management of water resources in Amador and Calaveras Counties as well as portions of Alpine and Tuolumne Counties. The authority consists of multiple local government entities. Includes a general goal to enhance and restore riparian systems in the plan area, and prioritizes those in the Calaveras and Mokelumne River watersheds.	https://www.ebmud.com/water/about-your-water/water-supply/mokelumneamadorcalaveras-integrated-regional-water-management-plan	1/1/2022 (last updated)
Sustainable Groundwater Management Act Portal	Updated periodically	Yes	California Department of Water Resources' central website to find information about groundwater sustainability agencies and download groundwater sustainability plans. Groundwater sustainability agencies in the GAI include small portions of the Amador County, East Turlock Subbasin, Eastside San Joaquin, Merced Subbasin, and Stanislaus and Tuolumne Rivers Groundwater Sustainability Agencies and the entirety of the County of Tuolumne Groundwater Sustainability Agency. In the GAI, groundwater sustainability plans exist for the San Joaquin Valley, segmented between Eastern San Joaquin, Merced, Modesto, and Turlock.	https://sgma.water.ca.gov/portal/	Updated nearly continuously
Tahoe-Sierra Integrated Regional Water Management Plan	Final	No	Tahoe Sierra Regional Water Management Group's plan for the management of water resources in the plan area, which includes the northernmost portion of the GAI. The group consists of multiple local government entities. Includes general goals to improve water quality and restore degraded streams and wetlands.	This document is no longer publicly available.	7/19/2007
Tuolumne-Stanislaus Integrated Regional Water Management Plan	Updated periodically	No	Regional Water Management Group's plan for the management of water resources in the plan area, which primarily consists of Tuolumne County, along with small portions of Alpine and Calaveras Counties. Includes general objectives to reduce contamination in waterways and restore wetlands, springs, fens, vernal pools, and riparian habitats.	https://tstan-irwma.org/library/documents/	10/1/2017 (last updated)
Yosemite-Mariposa Integrated Regional Water Management Plan	Updated periodically	Yes	Mariposa County Resource Conservation District's plan for the management of water resources in Mariposa County. Includes a goal to restore 10,000 acres of habitat for special-status species by 2035.	https://drive.google.com/file/d/1IBKveFvB1zSr4xm4iaklInnDhKID7P5xx/view	6/1/2016 (last revised)
TMDL Action Plans (Sacramento River and San Joaquin Basin Regions)	Updated periodically	No	SWRCB and Central Valley RWQCB's list of TMDL action plans for the Sacramento River and San Joaquin Basin 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 (North Lahontan and South Lahontan Regions)	Updated periodically	No	SWRCB and Lahontan RWQCB's list of TMDL action plans for the 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
Alpine County General Plan	Updated periodically	Yes	General plan for Alpine County. Requires mitigation for impacts on wetland habitat. Includes land use designations for wilderness, stream environments, and open space.	https://www.alpinecountyca.gov/615/General-Plan	8/17/2021 (last amended)
Amador County General Plan	Updated periodically	Yes	General plan for Amador County. Includes land use designations of open recreation, general forest, open forest, and open wilderness. The land use categories of open recreation and general forest do not exclude development.	https://www.amadorgov.org/departments/planning/general-plan-update-draft-environmental-impact-report-and-draft-general-plan	7/1/2016 (last amended)
Calaveras County General Plan	Updated periodically	Yes	General plan for Calaveras County. Includes a land use designation of resource management.	https://planning.calaverasgov.us/General-Plan	10/13/2020 (last amended)
El Dorado County General Plan	Updated periodically	Yes	General plan for El Dorado County. Includes land use designations of natural resource and open space. Requires 100-foot buffers around perennial streams and 50-foot buffers around wetlands. Requires mitigation for impacts on wetland habitat.	https://www.edcgov.us/Government/planning/pages/adopted_general_plan.aspx	12/10/2019 (last amended)
The County of Mariposa General Plan	Updated periodically	Yes	General plan for Mariposa County. Includes a land use designation of natural resources.	https://www.mariposacounty.org/1142/Volume-I---Mariposa-County-Wide-General-	8/20/2019 (last amended)
2030 Merced County General Plan	Updated periodically	Yes	General plan for Merced County. Requires a setback buffer of indeterminate amount around wetlands and riparian habitat, including an appropriate setback for developed and agricultural uses from the delineated edges of wetlands. Supports restoration of the Merced River. Includes a land use designation for foothill pasture and open space.	https://www.co.merced.ca.us/100/General-Plan	7/12/2016 (last amended)
Mono County General Plan	Updated periodically	Yes	General plan for Mono County. Includes land use designations of natural habitat protection, open space, and resource management. Includes a number of aquatic habitat goals.	https://monocounty.ca.gov/planning/page/general-plan	12/1/2015 (last amended)
Stanislaus County General Plan	Updated periodically	Yes	General plan for Stanislaus County. Includes land use designation of natural open space, which excludes development on 75 acres of riparian habitat. The County currently applies the agriculture designation to areas suitable for open space or recreational use, including a proposed 244-acre river park along the Stanislaus River.	http://www.stancounty.com/planning/pl/general-plan.shtm	8/21/2016 (last amended)
Tuolumne County General Plan	Updated periodically	Yes	General plan for Tuolumne County, which includes a general goal to enhance Sullivan Creek, Elsey's Pool, Curtis Creek, and Sonora Creek. Includes land use designations of open space and parks and recreation. A 200-foot building setback is required from the thread of Sullivan, Flores, and Curtis Creeks.	https://www.tuolumnecounty.ca.gov/DocumentCenter/View/5782/02-TC-TOC	12/28/2018 (last amended)
City General Plans	See below	See below	See below	See below	See below
Amador City Code of Ordinances	Updated periodically	No	The City of Amador does not appear to have a formal General Plan but operates with city ordinances. Zoning in the city does not include an open space designation.	https://library.municode.com/ca/amador_city/code/s/code_of_ordinances	5/26/2020 (last updated)
Angels Camp 2020 General Plan	Updated periodically	Yes	General plan for Angels Camp. Establishes an open space setback of an indeterminate distance encompassing designated flood hazard areas along Angels and Six Mile Creeks. Includes a land use designation of open space. Includes a plan to draft a Creek Corridor Preservation and Management Plan for Angels Creek.	https://angelscamp.gov/community-development/planning/	11/15/2021 (last revised)
City of Ione General Plan	Updated periodically	Yes	General plan for Ione. Includes a land use designation of open space. Requires preservation of all trees of 36 inches in diameter at breast height (which would include riparian trees) or greater on development sites, unless health, safety, or access requirements do not allow for preservation of such trees. Requires setbacks of an indeterminate distance for all development from wetlands or for development occurring adjacent to wetlands or waterways.	https://www.ione.ca.gov/city-council/page/city-ione-general-plan	8/1/2009 (last amended)
City of Jackson General Plan	Updated periodically	Yes	General plan for Jackson. Includes a land use designation of open space. There is also a creek/floodplain overlay designed to discourage development within these areas.	https://www.ci.jackson.ca.us/planning_department.php#outer-261	3/1/2015 (last updated)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Town of Mammoth Lakes General Plan	Updated periodically	Yes	General plan for Mammoth Lakes. Includes a land use designation of open space and national forest.	https://www.townofmammothlakes.ca.gov/162/General-Plan	8/7/2019 (last amended)
City of Plymouth General Plan	Not applicable	Not applicable	The City of Plymouth website does not appear to be functional, and it cannot be determined if a general plan is publicly available outside of the city.	Not applicable	Not applicable
City of Sonora General Plan 2020	Updated periodically	Yes	General plan for Sonora. Requires streamside setbacks of 50 feet on both sides of Woods Creek, Sonora Creek, and Dragoon Gulch (as measured from the top of the bank of the creek or drainage channel). Includes a unified land use designation of park/recreation/resource/open space.	https://www.sonoraca.com/city-services/general-plan/	10/16/2017 (last revised)
Sutter Creek General Plan	Updated periodically	Yes	General plan for Sutter Creek. Includes a land use designation of open space and a creekside greenway overlay designed to limit development in riparian habitats.	https://www.cityofsuttercreek.org/media/9986	7/1/2019 (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 SFEI.	https://www.ecoatlas.org/	Updated nearly daily
California Riparian Habitat Restoration Handbook	Final	No	Guidelines for riparian habitat restoration in the Central Valley.	https://www.bing.com/ck/a?!&&p=20b13014432ed949f962eabdc592381a3259f565190896b955eec4a1e9ebfe6JmldHM9MTc4Mjk1MDQwMA&pntn=3&ver=2&hsh=4&fclid=13c6dc71-8d58-6d6f-2204-ca848c496c97&psq=California+Riparian+Habitat+Restoration+Handbook&u=a1aHR0cHM6Ly9ucm0uZGZnLmNhLmdvdi9GaWxlSGFuZGxlc5hc2h4P0RvY3VtZW50SUQ9MjI4MDA2	7/1/2009
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://ftp.sccwrp.org/pub/download/DOCUMENTS/TechnicalReports/859_StatusAndTrendsDemo.pdf	4/1/2015
Final Central Valley Salt & Nitrate Management Plan	Final	Yes	Management plan from Central Valley Salts to control the amount of salinity and nitrate levels in the region's water supply.	https://www.cvsalinity.org/docs/central-valley-snmp/final-snmp.html	12/1/2016
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.

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

HCPs¹ and NCCPs² define covered activities that consist of specific projects and actions that may have adverse effects on covered species and natural communities. FWS and/or CDFW estimate the adverse effects associated with the covered activities and issue incidental take permits. 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 FESA.

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 FESA or consultations under Section 7 of the FESA

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 and sensitive habitats. The legal document for the establishment, operation, and use of a conservation or mitigation bank is a Bank Enabling Instrument (“BEI”).

Caltrans identified 24 active or pending conservation and/or mitigation banks with service areas that overlap at least part of the SHS in 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 4-7. 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 in the GAI but do not overlap any state highways in the GAI. These banks were omitted from Table 4-1 because they would not be usable by Caltrans for fulfilling mitigation requirements. It should also be noted that several of the banks listed in Table 4-1 intersect only slightly with state highways in the GAI and would, therefore, be usable as mitigation only for projects in those very specific parts of the GAI where the overlap occurs.

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

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
Alkali Sink Conservation Bank	2015	Active – credits available	FWS, CDFW	Fresno	No	943.43	Swainson's hawk, vernal pool fairy shrimp (sold out), burrowing owl, San Joaquin kit fox
Antonio Mountain Ranch Mitigation Bank	2018	Active – credits available	FWS, CDFW, Corps	Placer	No	797.9	Swainson's hawk foraging habitat, tricolored blackbird foraging habitat, vernal pool fairy shrimp, intermittent stream, perennial stream, vernal pools, and seasonal wetlands
Big Gun Conservation Bank	2010	Active – credits available	FWS	Placer	No	52	California red-legged frog
Bryte Ranch Conservation Bank	2002	Active – credits available	FWS, CDFW	Sacramento	No	589	Swainson's hawk foraging habitat, burrowing owl foraging habitat, vernal pool fairy shrimp, and vernal pool tadpole shrimp
Bullock Bend Mitigation Bank	2016	Active – credits not available ^d	FWS, CDFW, Corps, EPA, NMFS	Yolo	Yes	119.65	Swainson's hawk nesting buffer; Central Valley steelhead; Chinook salmon – Central Valley spring run, fall/late fall run, and winter run; riverine riparian; and floodplain riparian
Cayetano Creek Mitigation Bank	2023	Active – credits available	FWS, Corps	Contra Costa and Alameda	No	101.25	California tiger salamander, California red-legged frog, San Joaquin kit fox, burrowing owl, Congdon's tarplant, seasonal wetland, and riparian woodland
Clay Station Mitigation Bank	1999	Active – credits available	FWS, CDFW, Corps	Sacramento	No	405	Seasonal wetlands/marsh and vernal pool establishment

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
Deadman Creek Conservation Bank	2007	Active – credits available	FWS	Merced	No	714	California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, and vernal pool tadpole shrimp
Dolan Ranch Conservation Bank	1999	Active – credits available	FWS, CDFW	Colusa	No	252	Swainson's hawk, burrowing owl, vernal pool tadpole shrimp, giant garter snake (sold out), vernal pool fairy shrimp, vernal pool creation, and vernal pool preservation
Drayer Ranch Conservation Bank	2005	Active – credits available	FWS	Merced	No	254.4	California tiger salamander (sold out), San Joaquin kit fox (sold out), and vernal pool preservation
Elsie Gridley Mitigation Bank	2006	Active – credits available	FWS, CDFW, Corps	Solano	Amendment pending	1,815	Swainson's hawk, California tiger salamander, burrowing owl, vernal pool species, perennial wetlands, seasonal wetlands, and riparian wetlands
Fitzgerald Ranch Conservation Bank	1999	Active – credits available	FWS	San Joaquin	No	808	California tiger salamander and vernal pool fairy shrimp
Fremont Landing Conservation Bank	2006	Active – credits available	NMFS	Yolo	No	100	Riparian floodplain forest habitat, shaded riverine aquatic habitat, salmonids, and green sturgeon
Great Valley Conservation Bank at Flynn Ranch	2007	Active – credits available	FWS	Merced	No	1,067	California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, and vernal pool tadpole shrimp

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
Kennedy Table Conservation Bank	2004	Active – credits available	FWS	Madera	No	600	Vernal pool fairy shrimp and succulent owl's clover
Muzzy Ranch Conservation Bank	2008	Active – credits available	FWS, CDFW	Solano	No	1,209	Swainson's hawk and other raptor foraging habitat, California tiger salamander, burrowing owl nesting and foraging habitat, vernal pool branchiopods, Delta green ground beetle, and San Joaquin Orcutt grass
Piedra Azul Conservation Bank	2022	Active – credits available	FWS, CDFW	Merced	No	2,418	California red-legged frog aquatic and foraging habitat, California tiger salamander aquatic habitat, and burrowing owl foraging habitat
Sacramento River Ranch VELB Conservation Bank	2005	Active – credits available	FWS	Yolo	No	211	Valley elderberry longhorn beetle
Sand Creek Conservation Bank	2007	Active – credits available	FWS	Tulare	No	498	California tiger salamander, San Joaquin kit fox, and vernal pool fairy shrimp (sold out)
Sunrise Douglas Mitigation Bank	2008	Active – credits available	FWS, CDFW	El Dorado	No	482	Vernal pool ecosystem preservation, vernal pool fairy shrimp, vernal pool tadpole shrimp, Sacramento Orcutt grass, and slender Orcutt grass
Toad Hill Ranch Mitigation Bank	2010	Active – credits available	FWS, Corps, EPA	Placer	No	1,630	Vernal pool creation, vernal pool preservation, and seasonal wetland (sold out)

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
Van Vleck Mitigation Bank	2009	Active – credits available	FWS, CDFW, Corps, EPA	Sacramento	No	775	Swainson's hawk, vernal pool preservation, and vernal pool creation
Vieira Ranch Conservation Bank	2025	Active – credits available	FWS, CDFW	Alameda	Yes	670	California tiger salamander, California red-legged frog, burrowing owl, and San Joaquin kit fox
White Rock Road Properties – Scott Road Conservation Bank	2019	Active – credits available	FWS	Sacramento	No	191	Vernal pool fairy shrimp and vernal pool tadpole shrimp

^a Up-to-date information on approved conservation and mitigation banks, including available credits, can be found at the following websites:

<https://www.wildlife.ca.gov/Conservation/Planning/Banking/Approved-Banks>

<https://ribits.ops.usace.army.mil/ords/f?p=107:2:.....>

<https://ecos.fws.gov/ecp/report/conservation-plans-region-summary?region=8&type=HCP>

^b Signatories in **bold** (all those listed in table) are signatories to the Master Process Agreement (Caltrans et al. 2020).

^c Bank service area boundaries may extend well outside of the county where the bank itself is located.

^d Credits at the Bullock Bend Mitigation bank are reserved and sold out (L. Shively, Corps, personal communication 2022). Hence, they are not available for the purposes of this RAMNA or for planning.

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

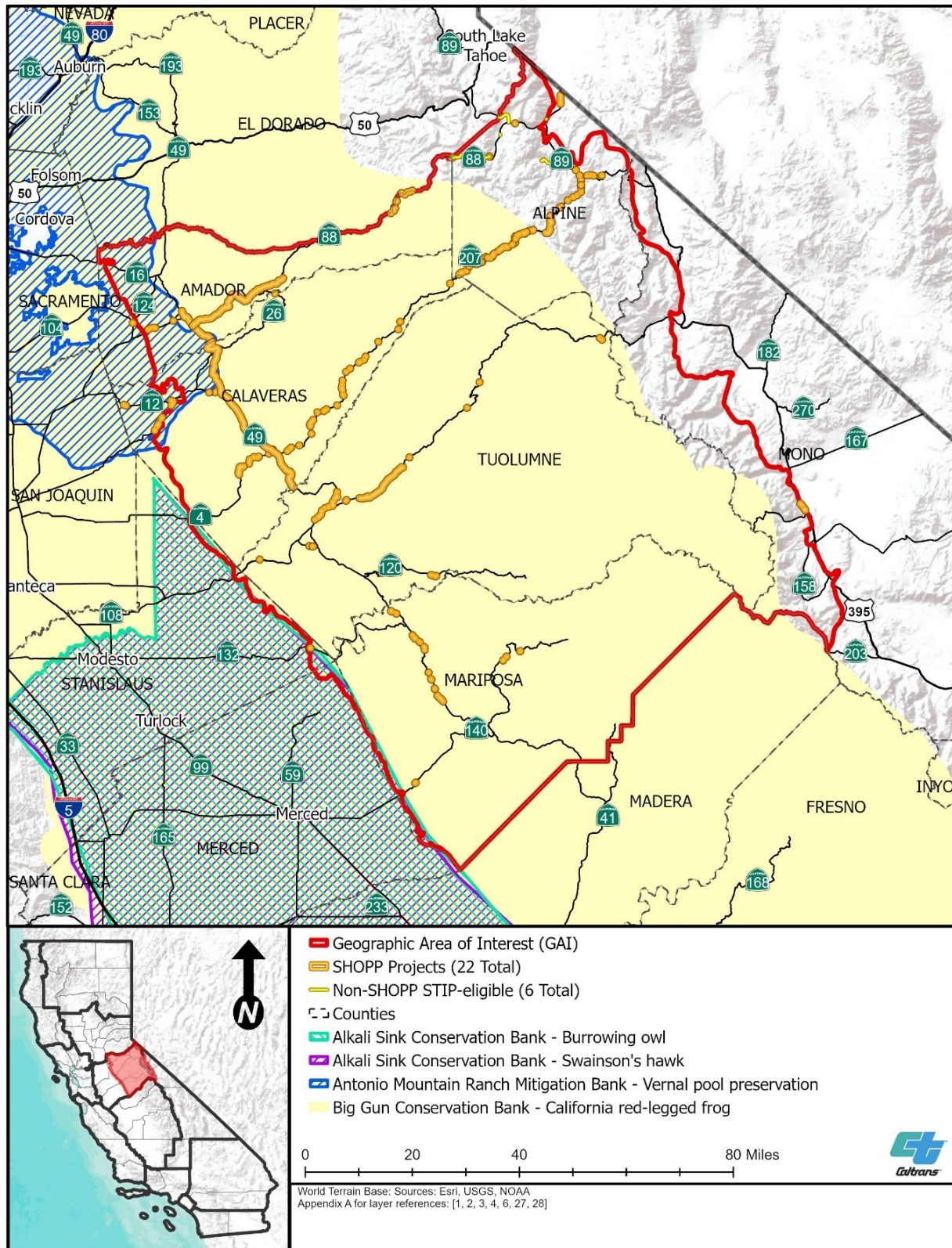


Figure 4-2. Conservation and Mitigation Bank Service Areas – Part 2

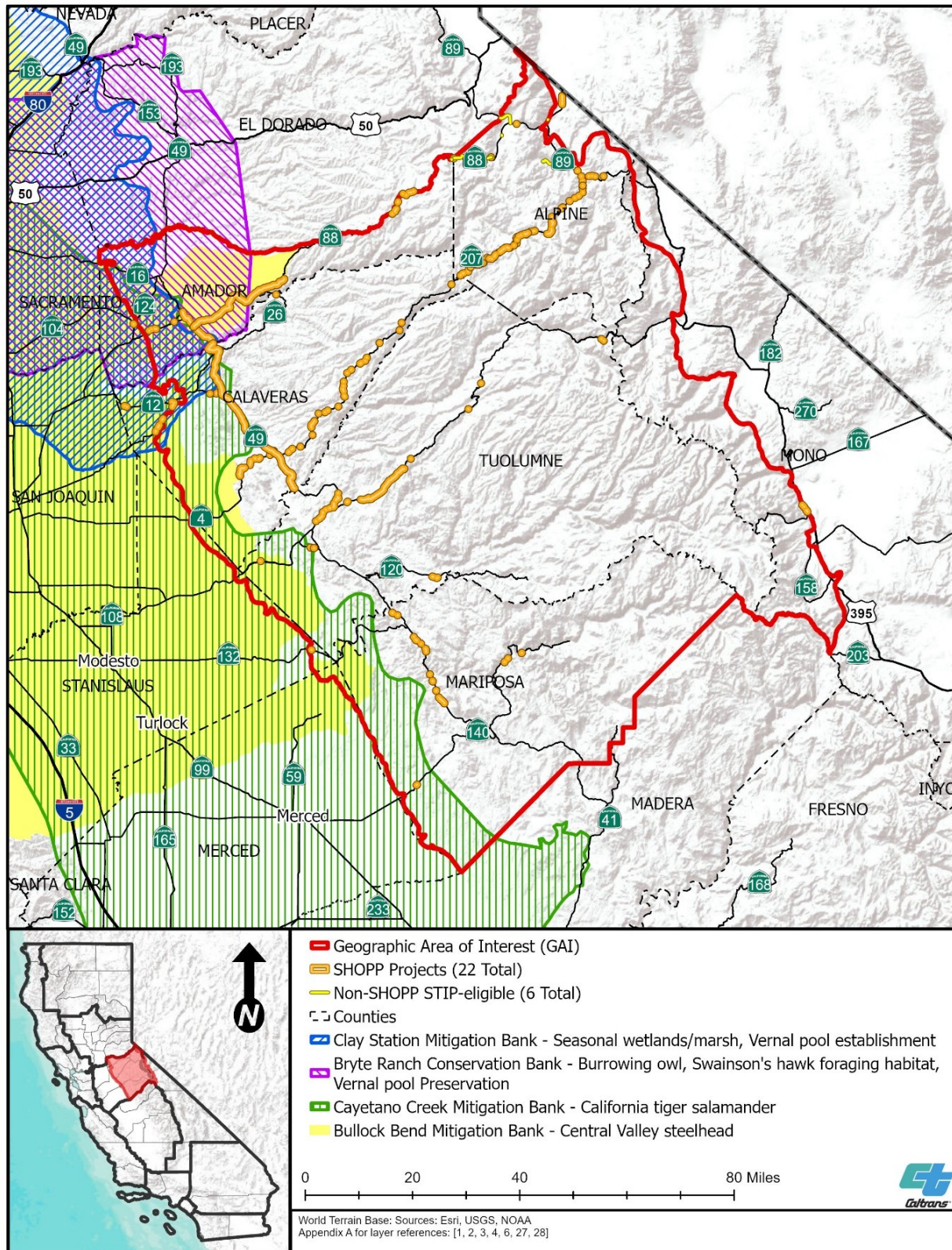


Figure 4-3. Conservation and Mitigation Bank Service Areas – Part 3

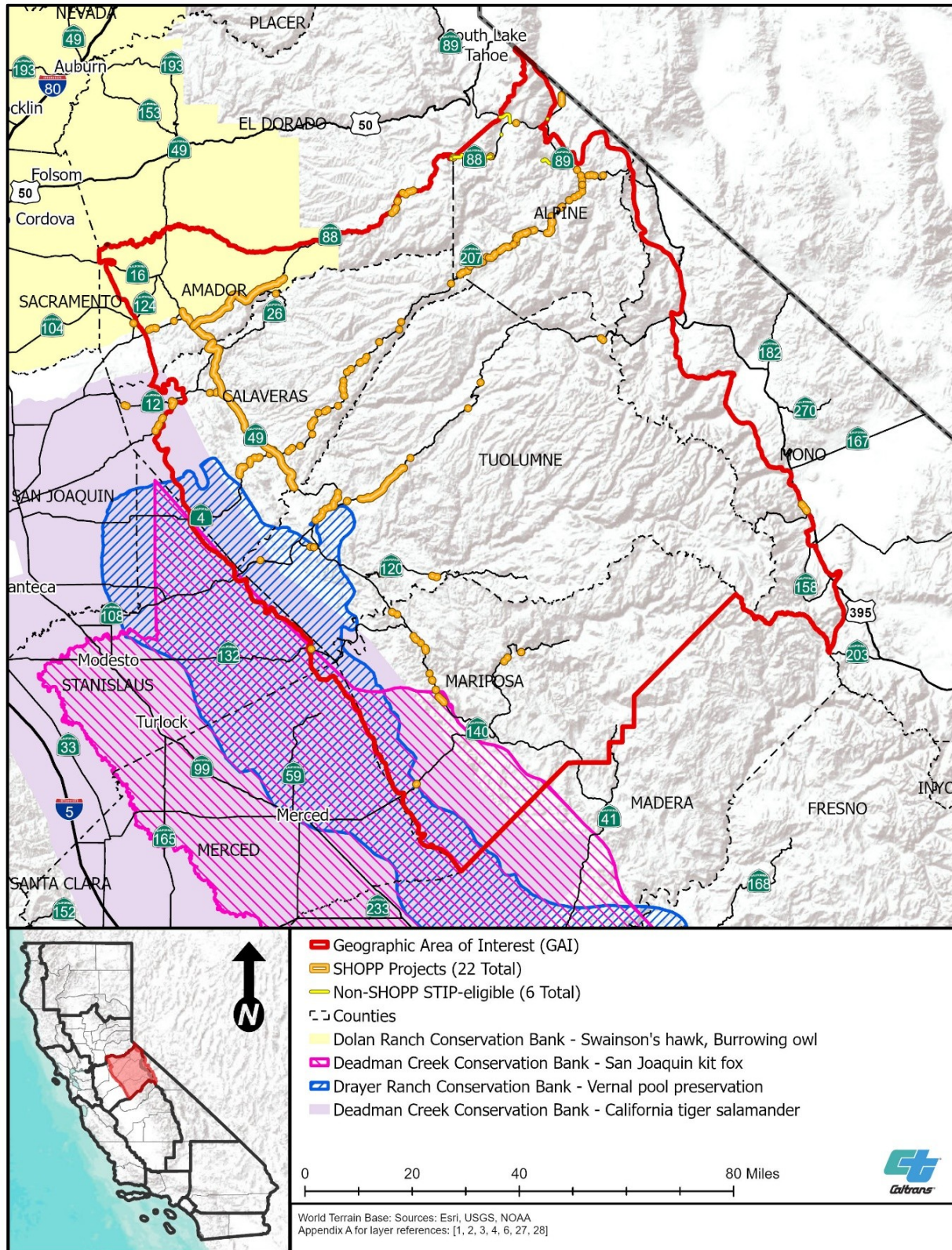


Figure 4-4. Conservation and Mitigation Bank Service Areas – Part 4

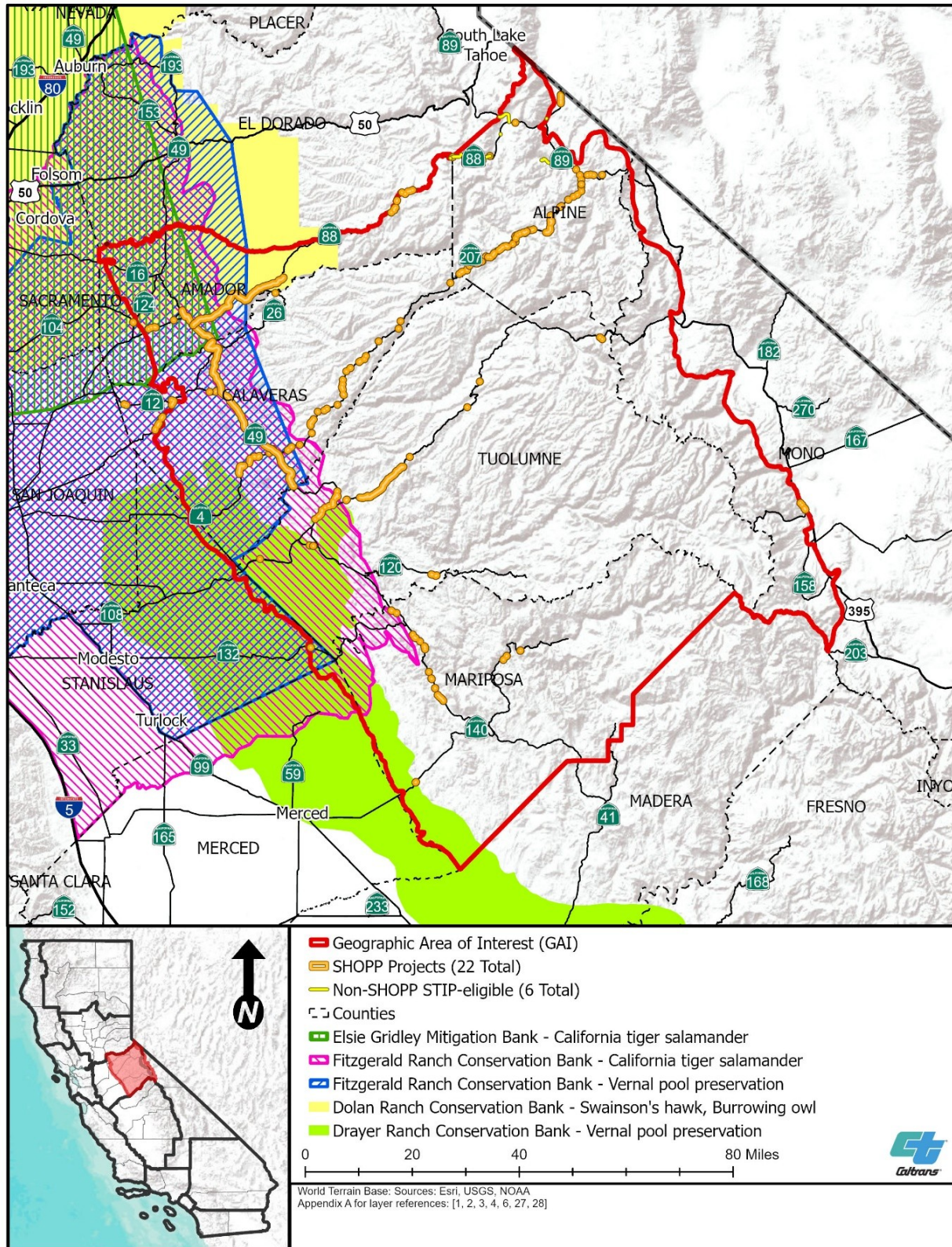


Figure 4-5. Conservation and Mitigation Bank Service Areas – Part 5

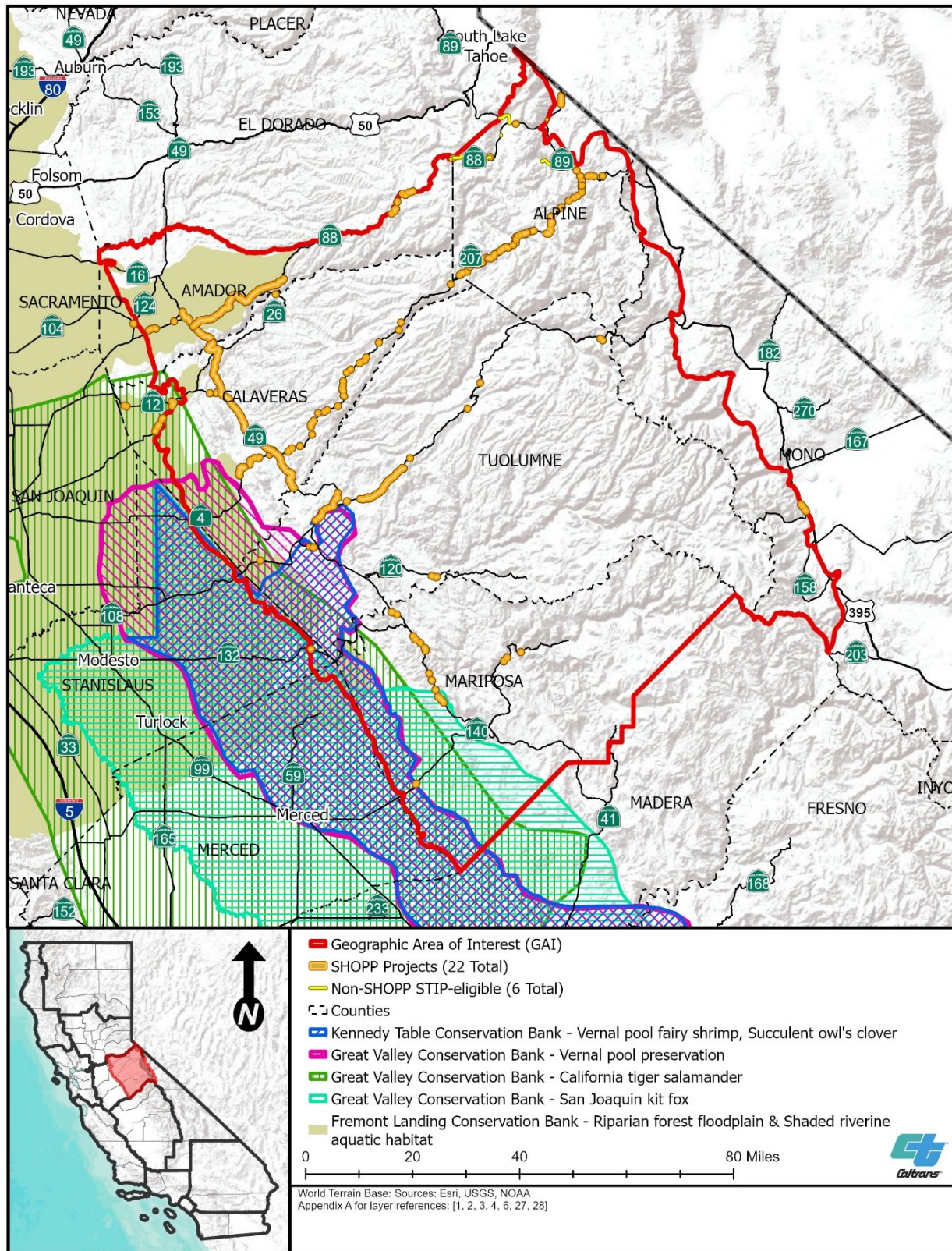
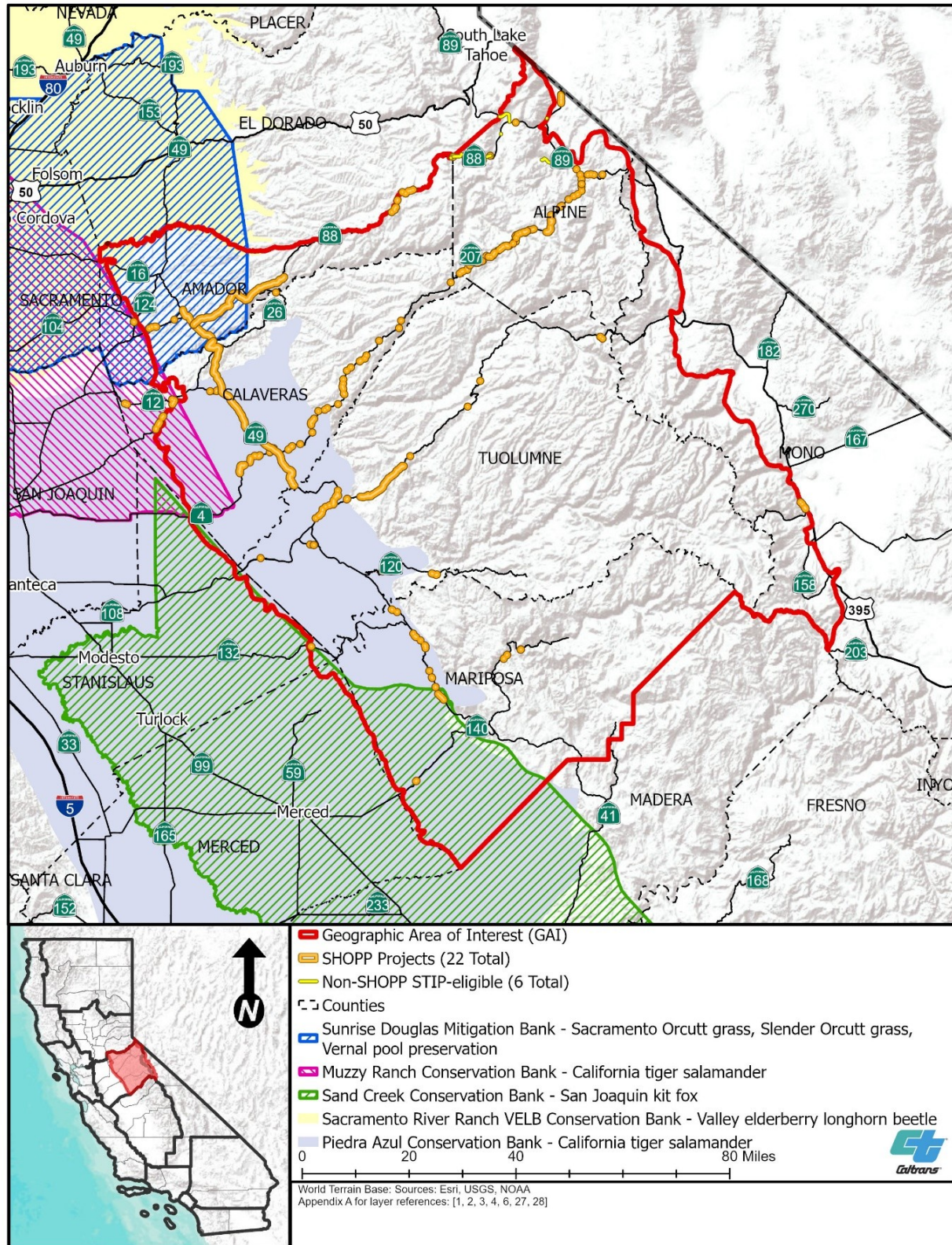


Figure 4-6. Conservation and Mitigation Bank Service Areas – Part 6



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 In-Lieu Fee Program (Table 4-2, Figures 4-8 and 4-9). This in-lieu fee program has nine separate service areas for different resources in different regions under its jurisdiction that overlap the GAI, as shown on Figures 4-8 and 4-9.

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

Name	Year Approved	Signatories ^b	Instrument Includes Pre-transfer Credit Purchases?	Location	Credit Types
NFWF Sacramento District California In-Lieu Fee Program	2014	Corps, EPA, NMFS, RWQCB, SWRCB, NFWF	Yes	Multiple service areas within the Corps Sacramento District Boundary (entire)	- American – aquatic resources - Cosumnes-Mokelumne – aquatic resources - Carson/Walker Basin aquatic resources - Calaveras/Stanslaus aquatic resources - Merced/Tuolumne (Ahwahnee Meadow) – aquatic resources - San Joaquin – aquatic resources - Southern Sierra Foothills (Flying M Ranch) – vernal pools - Southeastern Sacramento Valley – 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** (all listed in table except for NFWF) are signatories to the Master Process Agreement (Caltrans et al. 2020).

Figure 4-8. In-lieu Fee Programs in the GAI – Part 1

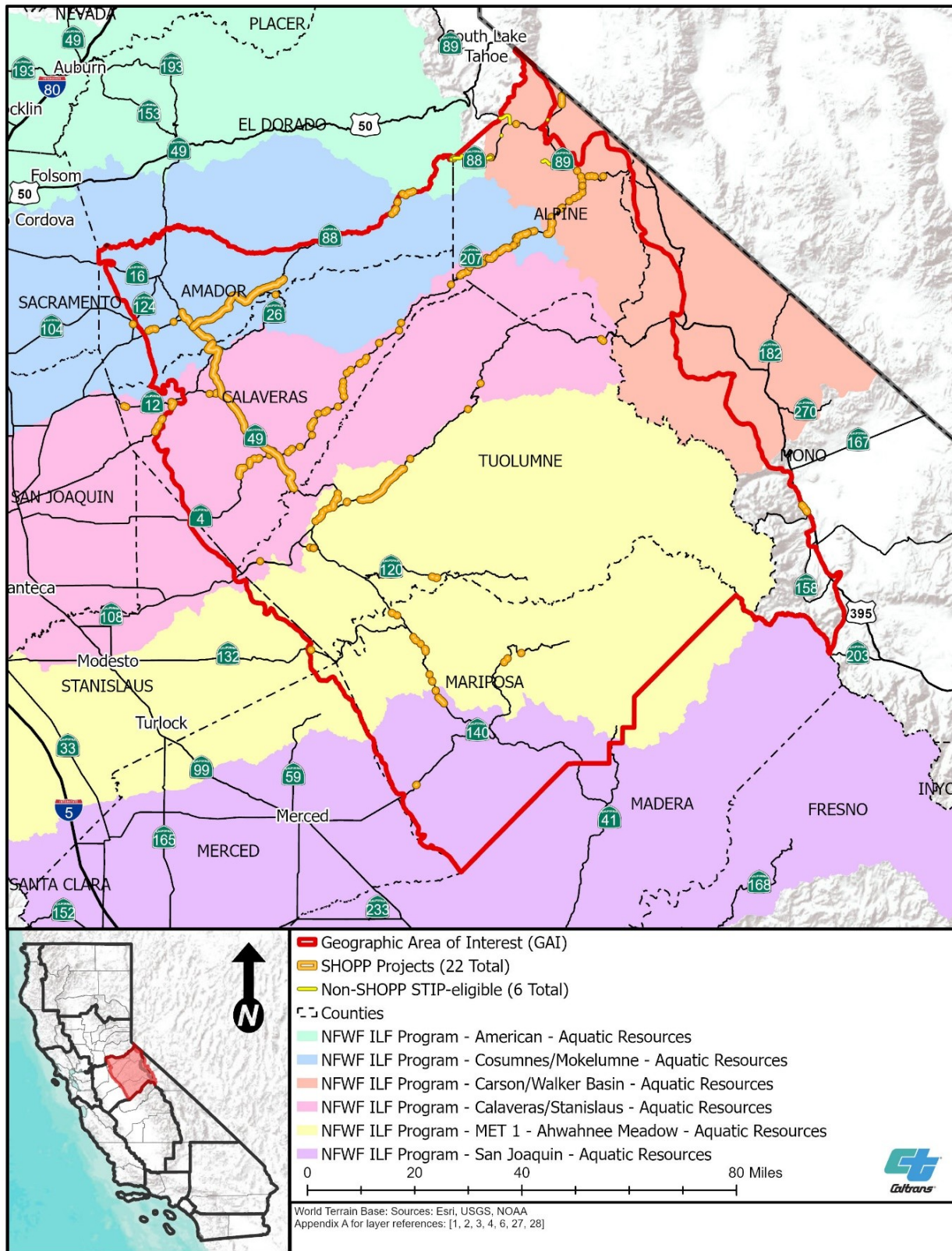
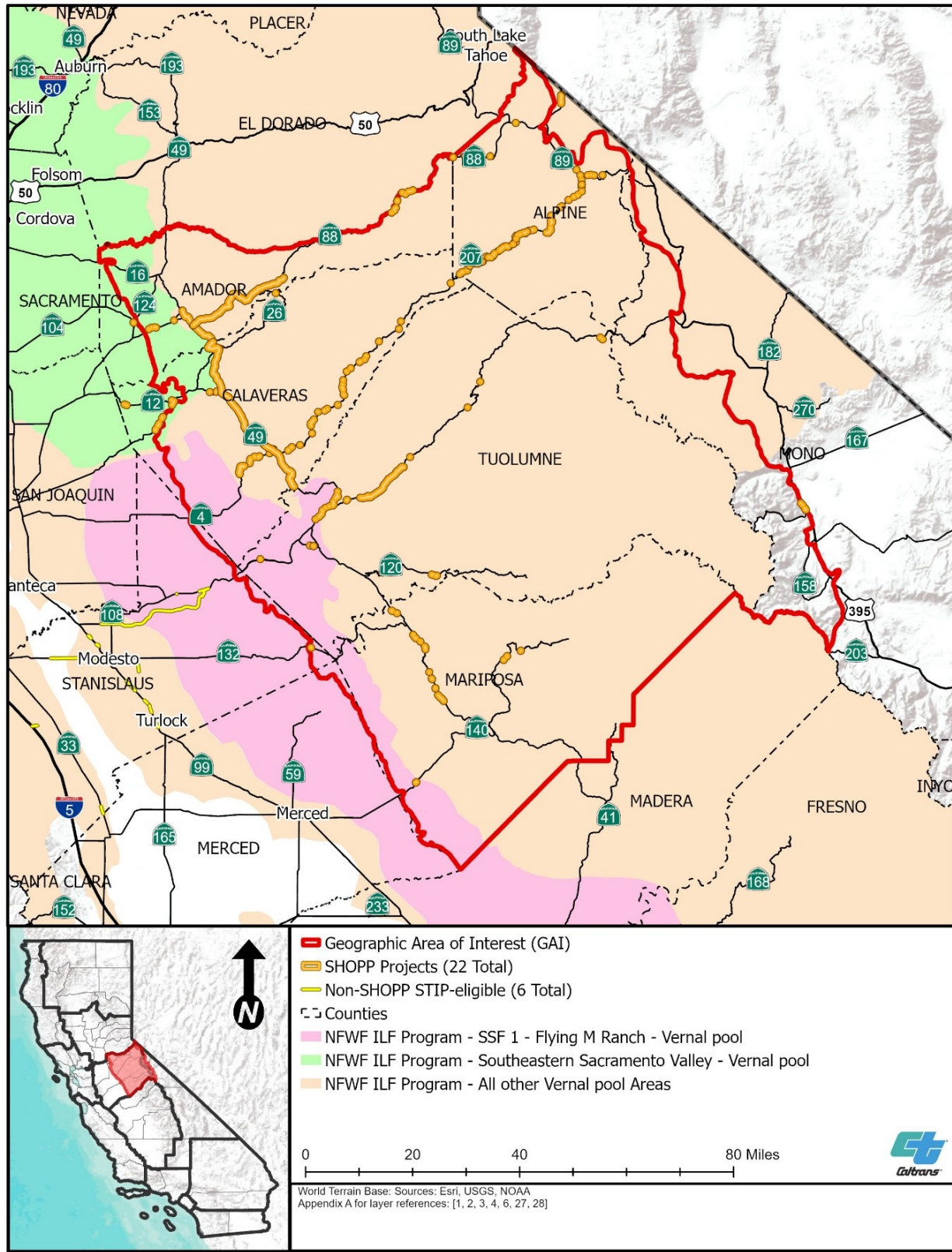


Figure 4-9. In-lieu Fee Programs in the GAI – Part 2



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 within 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 an RCIS is approved by CDFW and contains the elements described in FGC § 1856(b). Then, with respect to the SHS, a useful MCA would 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 FGC § 1856, and additional guidance is available in *Regional Conservation Investment Strategies Program Guidelines* (CDFW 2023b). It is important to note that MCAs are not permits such as 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.

Caltrans did not identify any active or pending RCISs with service areas that overlap the GAI. Because MCAs are issued once an RCIS has been approved, there are also currently no MCAs in this GAI.

4.6 Wildlife Crossing and Aquatic Corridor Enhancements

In 2022, FGC § 1955 et seq. authorized CDFW to approve compensatory mitigation credits for a “wildlife connectivity action” through its banking or RCIS programs. Therefore, when wildlife crossings and aquatic corridor enhancements improve the permeability of the SHS, through a BEI or MCA developed under an RCIS, CDFW is authorized to recognize CESA and Lake and Streambed Alteration credits for construction made separate and distinct from a specific transportation project. CDFW's Wildlife Connectivity Advance Mitigation Guidelines are in progress and will assist the process. Connectivity information for the GAI is summarized in Section 2.9.

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5. MODELED ESTIMATED IMPACTS

In this chapter, Caltrans documents the potential compensatory mitigation needs in the GAI for fiscal years 2023/24 to 2032/33. 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 areas of potential riparian function.

Caltrans District 10 chose to focus the analysis on terrestrial and aquatic resources (Section 1.5). The results presented below are organized by the Sierra Nevada and Sierra Nevada Foothills Ecoregion Sections within District 10, 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 10, 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 2018).

To identify the list of SHOPP projects planned for the GAI, Caltrans consulted the SHOPP Ten-Year Book for fiscal years 2023/24 to 2032/33 (Caltrans 2023a). 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 22 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 22 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, 2023c). The SAMNA model, its foundation, and assumptions are described in the *Statewide Advance Mitigation Needs Assessment Report* (Caltrans 2023b), 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 terrestrial 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.

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 constrained¹ regional transportation plan, with a Ready to List² year identified as occurring in the 10-year planning horizon. From this evaluation, six planned STIP-eligible transportation projects were identified in the GAI for fiscal years 2023/24 to 2032/33 that could possibly benefit from AMA-funded advance mitigation projects.

Non-SHOPP STIP-eligible Potential Impacts

Once the non-SHOPP, STIP-eligible projects and their activities were identified, their potential impacts were assessed qualitatively. Qualitative analysis consisted of assessing the identified non-SHOPP, STIP-eligible projects in the context of the landscape in which they occur and their proximity to SHOPP projects. The potential terrestrial and aquatic resources predicted to be affected were identified from the same datasets used for the SAMNA analysis, but transportation project footprints were not generated, nor were areas of potential impact calculated.

Six STIP-eligible transportation projects were identified that are planned in the GAI for fiscal years 2023/24 to 2032/33. There is the potential that these transportation projects would have compensatory mitigation conditions placed on them by natural resource regulatory agencies, similar to conditions placed on SHOPP transportation projects.

5.2 Estimated Plant and 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 in the GAI for species of mitigation need identified by Caltrans District 10, as well as for species that may co-occur in their habitats. The complete results of the SAMNA—inclusive of the 22 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 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, 116 non-fish special-status terrestrial species have the

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.

potential to occur in the GAI (Section 2.7; Appendix D; Caltrans 2023a). Using the methods described in Section 5.1.1, the SAMNA analysis determined that 22 SHOPP transportation projects could potentially affect 29 habitat types, which could support up to 90 special-status species (Table 5-1).

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

Ecoregion Section	Number of Caltrans SHOPP Projects ^a	Number of Habitats ^b	Number of Special-status Species ^{c,d}	Estimated Total Habitat Impact (acres)
Sierra Nevada	13	26	74	69.5
Sierra Nevada Foothills	13	12	67	122.6
Total^e	22	29	90	192.1

^a Transportation projects are listed in Appendix B.

^b Excludes urban areas.

^c 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.

^d Included in the SAMNA; see SAMNA Report (Caltrans 2023b).

^e 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 mitigation need, as identified in Section 1.5—California red-legged frog, California tiger salamander, foothill yellow-legged frog, Sierra Nevada yellow-legged frog, western spadefoot, and California spotted owl—were included in the analysis and each is discussed briefly in the subsections below.

5.2.1. California Red-legged Frog

Using the methods described in Section 5.1.1, impacts on California red-legged frog and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). Of the 22 SHOPP transportation projects evaluated, 16 are forecast to affect 179.9 acres of California red-legged frog habitat in the GAI (Table 5-2, at the end of this section; Caltrans 2023c).

5.2.2. 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). Of the 22 SHOPP transportation projects evaluated, 14 are forecast to affect 110.1 acres of California tiger salamander habitat in the GAI (Table 5-2; Caltrans 2023c).

5.2.3. Foothill Yellow-legged Frog

Using the methods described in Section 5.1.1, impacts on foothill yellow-legged frog and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). Of the 22 SHOPP transportation projects evaluated, 15 are forecast to affect 182.1 acres of foothill yellow-legged frog habitat in the GAI (Table 5-2; Caltrans 2023c).

5.2.4. Sierra Nevada Yellow-legged Frog

Using the methods described in Section 5.1.1, impacts on Sierra Nevada yellow-legged frog and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). Of the 22 SHOPP transportation projects evaluated, 11 are forecast to affect 26.3 acres of Sierra Nevada yellow-legged frog habitat in the GAI (Table 5-2; Caltrans 2023c).

5.2.5. Western Spadefoot

Using the methods described in Section 5.1.1, impacts on western spadefoot and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). Of the 22 SHOPP transportation projects evaluated, 6 are forecast to affect 4.0 acres of Western spadefoot habitat in the GAI (Table 5-2; Caltrans 2023c).

5.2.6. California Spotted Owl

Using the methods described in Section 5.1.1, impacts on California spotted owl and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). Of the 22 SHOPP transportation projects evaluated, 17 are forecast to affect 83.0 acres of California spotted owl habitat in the GAI (Table 5-2; Caltrans 2023c).

5.2.7. Potential Co-benefiting Species

The species of mitigation need co-occur with other protected plant, invertebrate, amphibian, reptile, bird, and mammal species. By procuring or establishing advance mitigation credits for one or more of the species of mitigation need, Caltrans District 10 will also benefit multiple special-status species that occur and use the same habitats.

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

- an additional 72 special-status terrestrial species that potentially use the same habitats in the Sierra Nevada Ecoregion Section (Table 5-3, at the end of this section); and
- an additional 106 special-status terrestrial species that potentially use the same habitats in the Sierra Nevada Foothills Ecoregion Section (Table 5-4, at the end of this section).

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

Ecoregion Section	California Red-legged Frog Habitat: Number of Caltrans SHOPP Projects ^a	California Red-legged Frog: Estimated Habitat Impact (acres)	California Tiger Salamander Habitat: Number of Caltrans SHOPP Projects ^a	California Tiger Salamander: Estimated Habitat Impact (acres)	Foothill Yellow-legged Frog Habitat: Number of Caltrans SHOPP Projects ^a	Foothill Yellow-legged Frog: Estimated Habitat Impact (acres)	Sierra Nevada Yellow-legged Frog Habitat: Number of Caltrans SHOPP Projects ^a	Sierra Nevada Yellow-legged Frog: Estimated Habitat Impact (acres)	Western Spadefoot Habitat: Number of Caltrans SHOPP Projects ^a	Western Spadefoot: Estimated Habitat Impact (acres)	California Spotted Owl Habitat: Number of Caltrans SHOPP Projects ^a	California Spotted Owl: Estimated Habitat Impact (acres)	Total
Sierra Nevada	7	59.3	1	0.6	6	61.8	10	25.7	0	0.0	8	45.1	64.8
Sierra Nevada Foothills	13	120.6	13	109.6	13	120.3	1	0.5	6	4.0	12	37.9	120.8
Total ^b	16	179.9	14	110.1	15	182.1	11	26.3	6	4.0	17	83.0	185.6

Source: Caltrans (2023d)
^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 5-3. Estimated SHOPP Impacts on Co-occurring Terrestrial Special-status Species: Sierra Nevada Ecoregion Section (acres)

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak-Foothill Pine	Chamise-Redshank Chaparral	Douglas-Fir	Jeffrey Pine	Lodgepole Pine	Mixed Chaparral	Montane Hardwood	Montane Hardwood-Conifer	Montane Riparian	Perennial Grassland	Ponderosa Pine	Red Fir	Riverine	Sierran Mixed Conifer	Subalpine Conifer	Wet Meadow
Not applicable	Not applicable	Total^a	13.26	1.58	0.23	1.02	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.11	13.76	1.08	0.45	1.85	0.14	0.07
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Chinese Camp brodiaea	<i>Brodiaea pallida</i>	FT, SE	8.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Congdon's lewisia	<i>Lewisia congdonii</i>	FS, SR	2.11	0.00	0.00	0.00	0.00	0.00	0.00	1.22	10.00	5.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Congdon's woolly sunflower	<i>Eriophyllum congdonii</i>	FS, SR	1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.83	8.57	2.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hartweg's golden sunburst	<i>Pseudobahia bahiifolia</i>	FE, SE	1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lone buckwheat	<i>Eriogonum apricum</i> var. <i>apricum</i>	FE, SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lone manzanita	<i>Arctostaphylos myrtifolia</i>	FT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	5.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Irish Hill buckwheat	<i>Eriogonum apricum</i> var. <i>prostratum</i>	FE, SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Layne's ragwort	<i>Packera layneae</i>	FT, SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.10	13.92	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mariposa lupine	<i>Lupinus citrinus</i> var. <i>deflexus</i>	ST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	8.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mariposa pussypaws	<i>Calyptridium pulchellum</i>	FT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	10.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Merced clarkia	<i>Clarkia lingulata</i>	FS, SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.83	8.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Red Hills vervain	<i>Verbena californica</i>	FT, ST	1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	8.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Joaquin Valley Orcutt grass	<i>Orcuttia inaequalis</i>	FT, SE	1.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yosemite onion	<i>Allium yosemitense</i>	FS, SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.22	10.00	5.53	0.00	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	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
California red-legged frog	<i>Rana draytonii</i>	FT, SSC	13.15	1.58	0.23	0.00	0.52	0.00	0.00	1.52	16.98	11.04	0.00	0.03	13.76	0.00	0.45	0.00	0.00	0.00

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak- Foothill Pine	Chamise- Redshank Chaparral	Douglas-Fir	Jeffrey Pine	Lodgepole Pine	Mixed Chaparral	Montane Hardwood	Montane Hardwood- Conifer	Montane Riparian	Perennial Grassland	Ponderosa Pine	Red Fir	Riverine	Sierran Mixed Conifer	Subalpine Conifer	Wet Meadow
California tiger salamander	<i>Ambystoma californiense</i>	FE, FT, ST	0.00	0.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Foothill yellow-legged frog	<i>Rana boylei</i>	FCE, FCT, FS, SE, ST, SSC	13.15	1.58	0.23	1.02	0.52	0.00	0.00	1.52	16.98	11.04	0.00	0.00	13.76	0.00	0.45	1.57	0.00	0.00
Limestone salamander	<i>Hydromantes brunus</i>	FS, ST, SFP	0.00	0.58	0.23	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Long-toed salamander	<i>Ambystoma macrodactylum</i>	FE, SE, SFP, SSC	0.00	0.00	0.00	0.00	0.00	0.17	0.89	0.00	0.00	0.04	0.23	0.00	0.00	1.08	0.00	0.29	0.00	0.04
Mount Lyell salamander	<i>Hydromantes platycephalus</i>	None	0.00	0.00	0.00	0.00	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	1.08	0.00	0.35	0.14	0.04
Northern leopard frog	<i>Lithobates pipiens</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Sierra Nevada yellow-legged frog	<i>Rana sierrae</i>	FE, FS, ST	0.00	0.00	0.00	0.00	0.00	0.17	0.89	0.00	9.98	5.57	0.28	0.00	5.38	1.08	0.45	1.78	0.14	0.04
Yosemite toad	<i>Anaxyrus canorus</i>	FT, FS, SSC	0.00	0.00	0.00	0.00	0.00	0.15	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.26	0.14	0.04
Reptiles	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Common sagebrush lizard	<i>Sceloporus graciosus</i>	FS	0.00	0.00	0.00	0.00	0.52	0.17	0.89	1.52	16.98	11.08	0.00	0.00	13.76	0.00	0.00	1.85	0.00	0.00
Birds	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Bald eagle	<i>Haliaeetus leucocephalus</i>	FS, SE, SFP, SFS	13.26	1.58	0.23	1.02	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.11	13.76	1.08	0.45	1.85	0.14	0.07
Bank swallow	<i>Riparia riparia</i>	FS, ST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Black swift	<i>Cypseloides niger</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Burrowing owl	<i>Athene cunicularia</i>	FS, SSC	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
California spotted owl	<i>Strix occidentalis occidentalis</i>	FCT, SSC	0.00	0.00	0.23	0.00	0.52	0.00	0.24	0.00	16.98	11.04	0.00	0.00	13.76	0.72	0.00	1.61	0.00	0.00
Golden eagle	<i>Aquila chrysaetos</i>	FS, SFS, SFP	13.26	1.58	0.23	1.02	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.11	13.76	1.08	0.00	1.85	0.14	0.07
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SSC	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Great blue heron	<i>Ardea herodias</i>	SFS	13.16	1.58	0.23	0.00	0.52	0.00	0.00	0.00	16.98	11.08	0.41	0.02	13.76	0.00	0.45	1.59	0.00	0.03
Great egret	<i>Ardea alba</i>	SFS	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak- Foothill Pine	Chamise- Redshank Chaparral	Douglas-Fir	Jeffrey Pine	Lodgepole Pine	Mixed Chaparral	Montane Hardwood	Montane Hardwood- Conifer	Montane Riparian	Perennial Grassland	Ponderosa Pine	Red Fir	Riverine	Sierran Mixed Conifer	Subalpine Conifer	Wet Meadow
Great gray owl	<i>Strix nebulosa</i>	FS, SE, SFS	0.00	0.00	0.00	0.00	0.00	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.69	0.00	1.61	0.00	0.04
Harlequin duck	<i>Histrionicus histrionicus</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.45	0.00	0.00	0.00
Loggerhead shrike	<i>Lanius ludovicianus</i>	SE, SSC	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Long-eared owl	<i>Asio otus</i>	SSC	13.26	1.58	0.23	1.02	0.00	0.00	0.00	1.52	16.98	11.08	0.41	0.11	13.76	0.00	0.00	1.85	0.00	0.07
Northern goshawk	<i>Accipiter gentilis</i>	FS, SSC, SFS	0.00	1.20	0.23	0.14	0.52	0.17	0.89	0.69	8.73	9.42	0.41	0.00	13.76	1.08	0.00	1.85	0.14	0.00
Northern harrier	<i>Circus cyaneus</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.41	0.02	0.25	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Olive-sided flycatcher	<i>Contopus cooperi</i>	SSC	0.00	0.00	0.23	1.02	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.00	13.76	1.08	0.00	1.85	0.14	0.00
Osprey	<i>Pandion haliaetus</i>	FS	13.26	1.58	0.23	0.00	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.11	13.76	1.08	0.45	1.85	0.14	0.07
Peregrine falcon	<i>Falco peregrinus</i>	SFS, SFP	13.26	1.58	0.23	1.02	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.11	13.76	1.08	0.45	1.85	0.00	0.07
Purple martin	<i>Progne subis</i>	SSC	13.13	1.58	0.23	0.00	0.47	0.00	0.00	0.00	16.50	11.00	0.00	0.00	11.89	0.00	0.45	1.33	0.00	0.00
Short-eared owl	<i>Asio flammeus</i>	SSC	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted owl	<i>Strix occidentalis</i>	FT, FS, ST, SFS, SSC	0.00	0.00	0.23	0.00	0.52	0.00	0.27	0.00	16.98	11.04	0.00	0.00	13.76	0.80	0.00	1.61	0.00	0.00
Tricolored blackbird	<i>Agelaius tricolor</i>	FS, ST, SSC	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vaux's swift	<i>Chaetura vauxi</i>	SSC	0.00	0.00	0.23	0.00	0.52	0.00	0.00	1.52	16.98	11.04	0.00	0.09	13.76	0.69	0.45	1.61	0.00	0.04
White-tailed kite	<i>Elanus leucurus</i>	FS, SFP	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Willow flycatcher	<i>Empidonax traillii</i>	FS, SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Yellow warbler	<i>Setophaga petechia</i>	SSC	0.00	1.58	0.23	1.02	0.52	0.00	0.00	1.52	16.98	11.04	0.10	0.00	13.76	0.00	0.00	1.51	0.00	0.00
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
Mammals	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
American badger	<i>Taxidea taxus</i>	SSC	13.26	1.58	0.23	1.02	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.11	13.76	1.08	0.00	1.85	0.14	0.07
Fisher	<i>Pekania pennanti</i>	FE, SSC	0.00	0.00	0.00	0.00	0.52	0.17	0.89	0.00	0.00	7.77	0.32	0.00	13.18	1.08	0.00	1.85	0.14	0.00
Fringed myotis	<i>Myotis thysanodes</i>	FS	13.26	1.58	0.23	1.02	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.11	13.76	1.08	0.45	1.85	0.00	0.00
Great Basin pocket mouse	<i>Perognathus parvus</i>	None	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak- Foothill Pine	Chamise- Redshank Chaparral	Douglas-Fir	Jeffrey Pine	Lodgepole Pine	Mixed Chaparral	Montane Hardwood	Montane Hardwood- Conifer	Montane Riparian	Perennial Grassland	Ponderosa Pine	Red Fir	Riverine	Sierran Mixed Conifer	Subalpine Conifer	Wet Meadow
Long-eared myotis	<i>Myotis evotis</i>	FS	0.00	1.58	0.23	1.02	0.46	0.17	0.89	1.31	13.05	9.30	0.41	0.11	11.73	1.08	0.45	1.82	0.14	0.07
Marten	<i>Martes caurina</i>	FS	0.00	0.00	0.00	0.00	0.00	0.17	0.89	0.00	0.00	0.04	0.41	0.11	0.00	1.08	0.00	0.41	0.14	0.07
Mountain beaver	<i>Aplodontia rufa</i>	FE, SSC	0.00	0.00	0.00	0.00	0.00	0.17	0.89	0.00	0.00	0.04	0.41	0.11	0.00	1.08	0.00	0.41	0.14	0.07
Mt. Lyell shrew	<i>Sorex lyelli</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Pallid bat	<i>Antrozous pallidus</i>	FS, SSC	13.26	1.58	0.23	1.02	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.11	13.76	1.08	0.45	1.85	0.00	0.07
Red fox	<i>Vulpes vulpes</i>	FE, FS, ST	0.10	0.00	0.00	0.00	0.00	0.02	0.57	0.00	0.00	0.02	0.25	0.00	0.00	0.10	0.00	0.00	0.09	0.03
Ringtail	<i>Bassariscus astutus</i>	SFP	13.26	1.58	0.23	1.02	0.52	0.17	0.00	1.52	16.98	11.08	0.41	0.11	13.76	0.00	0.00	1.85	0.00	0.07
Sierra Nevada red fox	<i>Vulpes vulpes necator</i>	FS, FE, ST	0.10	0.00	0.00	0.00	0.00	0.02	0.57	0.00	0.00	0.02	0.25	0.00	0.00	0.10	0.00	0.00	0.09	0.03
Small-footed myotis	<i>Myotis ciliolabrum</i>	FS	13.16	1.58	0.23	1.02	0.00	0.00	0.00	1.52	16.98	11.04	0.19	0.00	13.76	0.00	0.45	1.56	0.00	0.00
Snowshoe hare	<i>Lepus americanus</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.17	0.89	0.00	0.00	0.00	0.41	0.00	0.00	1.08	0.00	0.27	0.14	0.00
Spotted bat	<i>Euderma maculatum</i>	FS, SSC	13.26	1.58	0.23	0.00	0.00	0.17	0.00	0.00	0.00	11.08	0.41	0.11	13.76	0.00	0.45	1.85	0.00	0.07
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	FS, SSC	13.23	1.58	0.23	1.02	0.52	0.07	0.29	1.52	16.98	11.06	0.24	0.09	13.76	0.91	0.45	1.74	0.00	0.04
Western mastiff bat	<i>Eumops perotis</i>	FS, SSC	13.16	1.58	0.23	1.02	0.00	0.00	0.00	1.52	16.98	11.04	0.00	0.00	13.76	0.00	0.00	0.00	0.00	0.00
Western red bat	<i>Lasiurus blossevillii</i>	SSC	13.15	1.58	0.23	1.02	0.52	0.00	0.00	1.52	16.98	11.04	0.00	0.00	13.76	0.00	0.45	1.45	0.00	0.00
White-tailed jackrabbit	<i>Lepus townsendii</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.17	0.65	0.00	0.00	0.00	0.00	0.02	0.00	0.39	0.00	0.00	0.14	0.03
Wolverine	<i>Gulo gulo</i>	FCT, FS, ST, SFP	0.00	0.00	0.00	0.00	0.00	0.17	0.89	0.00	0.00	1.65	0.32	0.11	0.00	1.08	0.00	1.57	0.14	0.07
Yuma myotis	<i>Myotis yumanensis</i>	FS	13.26	1.58	0.23	1.02	0.52	0.17	0.89	1.52	16.98	11.08	0.41	0.11	13.76	1.08	0.45	1.85	0.14	0.07

Notes: FE = federally endangered; FCE = federally candidate endangered; FCT = federally candidate threatened; FS = federally sensitive (USFS and/or BLM sensitive); FT = federally threatened; SE = state endangered; SFP = state fully protected; SFS = state fire sensitive; SSC = species of special concern (CDFW); SR = state rare; ST = state threatened
^a These totals are not additive across all special-status species because each habitat type may provide suitable habitat for more than one special-status species or subspecies. The total acreage of each habitat type affected listed in the top row represents the largest number in each column, not the sum of the numbers.

Table 5-4. Estimated SHOPP Impacts on Co-occurring Terrestrial Special-status Species: Sierra Nevada Foothills Ecoregion Section (acres)

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak-Foothill Pine	Chamise-Redshank Chaparral	Lacustrine	Mixed Chaparral	Montane Hardwood	Riverine	Valley Foothill Riparian	Valley Oak Woodland
Not applicable	Not applicable	Total^a	51.58	19.92	32.54	0.20	0.54	1.17	0.74	0.36	4.65	9.14
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Boggs Lake hedge-hyssop	<i>Gratiola heterosepala</i>	FS, SE	51.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Chinese Camp brodiaea	<i>Brodiaea pallida</i>	FT, SE	51.58	0.00	0.00	0.00	0.00	0.00	0.74	0.00	0.00	0.00
Colusa grass	<i>Neostapfia colusana</i>	FT, SE	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Congdon's lewisia	<i>Lewisia congdonii</i>	FS, SR	5.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00
Congdon's woolly sunflower	<i>Eriophyllum congdonii</i>	FS, SR	5.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00
Greene's tuctoria	<i>Tuctoria greenei</i>	FE, SR	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hairy Orcutt grass	<i>Orcuttia pilosa</i>	FE, SE	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hartweg's golden sunburst	<i>Pseudobahia bahiifolia</i>	FE, SE	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Hoover's spurge	<i>Euphorbia hooveri</i>	FT	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
lone buckwheat	<i>Eriogonum apricum</i> var. <i>apricum</i>	FE, SE	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.00
lone manzanita	<i>Arctostaphylos myrtifolia</i>	FT	0.00	0.00	0.00	0.00	0.00	1.10	0.74	0.00	0.00	0.00
Irish Hill buckwheat	<i>Eriogonum apricum</i> var. <i>prostratum</i>	FE, SE	0.00	0.00	0.00	0.00	0.00	1.10	0.00	0.00	0.00	0.00
Layne's ragwort	<i>Packera layneae</i>	FT, SR	0.00	0.00	0.00	0.00	0.00	1.17	0.74	0.00	0.00	0.00
Mariposa lupine	<i>Lupinus citrinus</i> var. <i>deflexus</i>	ST	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00
Mariposa pussypaws	<i>Calyptridium pulchellum</i>	FT	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00
Merced clarkia	<i>Clarkia lingulata</i>	FS, SE	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00
Red Hills vervain	<i>Verbena californica</i>	FT, ST	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Joaquin Valley Orcutt grass	<i>Orcuttia inaequalis</i>	FT, SE	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Succulent owl's-clover	<i>Castilleja campestris</i> var. <i>succulenta</i>	FT, SE	1.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yosemite onion	<i>Allium yosemitense</i>	FS, SR	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.00	0.00	0.00

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak- Foothill Pine	Chamise- Redshank Chaparral	Lacustrine	Mixed Chaparral	Montane Hardwood	Riverine	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	See below	See below
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.13	0.00
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	1.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	0.93	0.00	0.00	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	See below	See below
California red- legged frog	<i>Rana draytonii</i>	FT, SSC	51.58	19.92	32.54	0.00	0.54	1.17	0.74	0.36	4.65	9.14
California tiger salamander	<i>Ambystoma californiense</i>	FE, FT, ST	49.68	19.22	30.33	0.00	0.54	0.00	0.00	0.00	3.93	5.87
Foothill yellow- legged frog	<i>Rana boylei</i>	FCE, FCT, FS, SE, ST, SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.74	0.36	4.65	9.14
Sierra Nevada yellow-legged frog	<i>Rana sierrae</i>	FE, FS, ST	0.00	0.00	0.00	0.00	0.54	0.00	0.00	0.00	0.00	0.00
Western spadefoot	<i>Spea hammondi</i>	FS, SSC	3.00	0.06	0.19	0.00	0.54	0.00	0.00	0.24	0.00	0.00
Reptiles	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Blainville's horned lizard	<i>Phrynosoma blainvillii</i>	FS, SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.00	0.00	4.65	9.14
Birds	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Bald eagle	<i>Haliaeetus leucocephalus</i>	FS, SE, SFP, SFS	51.58	19.92	32.54	0.20	0.54	1.17	0.74	0.36	4.65	9.14
Burrowing owl	<i>Athene cunicularia</i>	FS, SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.00	0.00	4.65	9.14
California spotted owl	<i>Strix occidentalis occidentalis</i>	FS, SSC	0.00	0.00	32.54	0.00	0.00	0.00	0.74	0.00	4.65	0.00
Golden eagle	<i>Aquila chrysaetos</i>	FS, SFS, SFP	51.58	19.92	32.54	0.20	0.00	1.17	0.74	0.00	4.65	9.14
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SSC	51.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Great blue heron	<i>Ardea herodias</i>	SFS	51.58	19.92	32.54	0.00	0.54	0.00	0.74	0.36	4.65	9.14
Great egret	<i>Ardea alba</i>	SFS	51.58	19.92	32.54	0.00	0.54	0.00	0.00	0.36	4.65	9.14
Loggerhead shrike	<i>Lanius ludovicianus</i>	SE, SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.74	0.00	4.65	9.14
Long-eared owl	<i>Asio otus</i>	SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.74	0.00	4.65	9.14

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak- Foothill Pine	Chamise- Redshank Chaparral	Lacustrine	Mixed Chaparral	Montane Hardwood	Riverine	Valley Foothill Riparian	Valley Oak Woodland
Northern harrier	<i>Circus cyaneus</i>	SSC	51.58	19.92	32.54	0.20	0.54	1.17	0.74	0.36	4.65	9.14
Olive-sided flycatcher	<i>Contopus cooperi</i>	SSC	0.00	0.00	0.89	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Osprey	<i>Pandion haliaetus</i>	FS	51.58	19.92	32.54	0.00	0.54	1.17	0.74	0.36	4.65	9.14
Peregrine falcon	<i>Falco peregrinus</i>	SFS, SFP	51.58	19.92	32.54	0.20	0.54	1.17	0.74	0.36	4.65	9.14
Purple martin	<i>Progne subis</i>	SSC	0.35	0.61	1.37	0.00	0.54	0.00	0.00	0.00	0.18	0.00
Short-eared owl	<i>Asio flammeus</i>	SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.00	0.00	4.65	9.14
Spotted owl	<i>Strix occidentalis</i>	FT, FS, ST, SFS, SSC	0.00	0.00	32.54	0.00	0.00	0.00	0.74	0.00	4.65	0.00
Swainson's hawk	<i>Buteo swainsoni</i>	FS, ST	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Tricolored blackbird	<i>Agelaius tricolor</i>	FS, ST, SSC	51.58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.65	0.00
Vaux's swift	<i>Chaetura vauxi</i>	SSC	0.00	0.00	0.89	0.00	0.54	0.00	0.00	0.00	0.00	0.00
White-tailed kite	<i>Elanus leucurus</i>	FS, SFP	51.58	19.92	32.54	0.20	0.00	1.17	0.00	0.00	4.65	9.14
Willow flycatcher	<i>Empidonax traillii</i>	FS, SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00
Yellow warbler	<i>Setophaga petechia</i>	SSC	0.00	19.92	32.54	0.20	0.00	1.17	0.74	0.00	4.65	9.14
Yellow-breasted chat	<i>Icteria virens</i>	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	4.65	0.00
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	SSC	1.25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mammals	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
American badger	<i>Taxidea taxus</i>	SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.74	0.00	4.65	9.14
Fringed myotis	<i>Myotis thysanodes</i>	FS	47.52	16.24	31.91	0.20	0.54	1.17	0.74	0.27	4.59	9.14
Kit fox	<i>Vulpes macrotis</i>	FE, ST	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Long-eared myotis	<i>Myotis evotis</i>	FS	0.00	0.00	0.43	0.00	0.54	0.00	0.00	0.00	0.07	0.00
Pallid bat	<i>Antrozous pallidus</i>	FS, SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.74	0.36	4.65	9.14
Ringtail	<i>Bassariscus astutus</i>	SFP	51.58	19.92	32.54	0.20	0.00	1.17	0.74	0.00	4.65	9.14
San Joaquin kit fox	<i>Vulpes macrotis mutica</i>	FE, ST	0.29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
San Joaquin pocket mouse	<i>Perognathus inornatus</i>	FS	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Small-footed myotis	<i>Myotis ciliolabrum</i>	FS	50.26	19.85	32.54	0.20	0.54	1.17	0.74	0.27	4.59	9.14
Spotted bat	<i>Euderma maculatum</i>	FS, SSC	51.51	19.92	32.54	0.00	0.00	0.00	0.00	0.27	4.59	9.14

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak- Foothill Pine	Chamise- Redshank Chaparral	Lacustrine	Mixed Chaparral	Montane Hardwood	Riverine	Valley Foothill Riparian	Valley Oak Woodland
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	FS, SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.74	0.36	4.65	9.14
Western mastiff bat	<i>Eumops perotis</i>	FS, SSC	51.58	19.92	32.54	0.20	0.00	1.17	0.74	0.00	4.65	9.14
Western red bat	<i>Lasiurus blossevillii</i>	SSC	51.58	19.92	32.54	0.20	0.54	1.17	0.74	0.36	4.65	9.14
Yuma myotis	<i>Myotis yumanensis</i>	FS	51.58	19.92	32.54	0.20	0.54	1.17	0.74	0.36	4.65	9.14

Notes: FE = federally endangered; FCE = federally candidate endangered; FCT = federally candidate threatened; FS = federally sensitive (USFS and/or BLM sensitive); FT = federally threatened; SE = state endangered; SFP = state fully protected; SFS = state fire sensitive; SR = state rare; SSC = species of special concern (CDFW); ST = state threatened
^a These totals are not additive across all special-status species because each habitat type may provide suitable habitat for more than one special-status species or subspecies. The total acreage of each habitat type affected listed in the top row represents the largest number in each column, not the sum of the numbers.

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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. Areas of potential riparian function are 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. Areas of potential riparian function were identified by using the statewide riparian landcover dataset.

5.3.1. Estimated Impacts on Threatened and Endangered Fish Habitat

Using the methods described in Section 5.1.1, impacts on aquatic species of mitigation need habitat were estimated for the 22 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 22 SHOPP transportation projects evaluated, 13 are forecast to affect 5.6 acres of aquatic species of mitigation need habitat (Table 5-5; Caltrans 2023c).

Table 5-5. Summary of Estimated SHOPP Impacts on Threatened and Endangered Fish Habitat in the GAI (acres)^{a,b,c}

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Lahontan Cutthroat Trout	Longfin Smelt	Paiute Cutthroat Trout	Total ^c
Upper Carson	16050201	2	0.2	0.0	0.2	0.2
Upper Mokelumne	18040012	5	3.3	3.3	0.0	3.3
Upper Stanislaus	18040010	6	1.6	0.0	0.0	1.6
Upper Tuolumne	18040009	4	0.0	0.0	0.4	0.4
Total^d	Not applicable	13	5.2	3.3	0.7	5.6

^a Threatened and endangered fish species habitat impacts are forecast by the SAMNA Reporting Tool.

^b The SAMNA forecasts impacts on wetlands for 4 of the 17 HUC-8s in the GAI.

^c 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.

^d Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin. Some special-status species occur in more than one HUC-8.

Lahontan Cutthroat Trout

Using the methods described in Section 5.1.1, impacts on Lahontan cutthroat trout and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 5.2 acres of Lahontan cutthroat trout habitat may be affected by 13 Caltrans SHOPP projects in the GAI (Table 5-5; Caltrans 2023c).

Longfin Smelt

Using the methods described in Section 5.1.1, impacts on longfin smelt and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 3.3 acres of longfin smelt habitat may be affected by 13 Caltrans SHOPP projects in the GAI (Table 5-5; Caltrans 2023c).

Paiute Cutthroat Trout

Using the methods described in Section 5.1.1, impacts on Paiute cutthroat trout and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 0.7 acre of Paiute cutthroat trout habitat may be affected by 13 Caltrans SHOPP projects in the GAI (Table 5-5; Caltrans 2023c).

5.3.2. Estimated Impacts on Wetlands

Using the methods described in Section 5.1.1, impacts on wetlands were estimated for the 22 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 22 SHOPP transportation projects evaluated, 8 would result in impacts on 1.2 acres of wetland habitat in the GAI, including 0.8 acre of freshwater emergent wetland and 0.4 acre of freshwater forested/shrub wetland (Table 5-6; Caltrans 2023c).

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 are based solely on the SAMNA's wetland data layer (Caltrans 2023c).

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	Total ^b
Middle San Joaquin-Lower Chowchilla	18040001	1	<0.1	0.0	<0.1
Upper Calaveras California	18040011	1	0.1	0.1	0.3
Upper Carson	16050201	1	<0.1	<0.1	<0.1
Upper Merced	18040008	1	0.0	<0.1	<0.1
Upper Mokelumne	18040012	2	0.5	0.2	0.7
Upper Stanislaus	18040010	1	<0.1	0.0	<0.1
Upper Tuolumne	18040009	2	0.1	0.1	0.2
Total^{b,c}	Not applicable	8	0.8	0.4	1.2

^a The SAMNA forecasts impacts on wetlands for 7 of the 17 HUC-8s in the GAI.

^b Totals may be different due to 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.

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 22 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 22 SHOPP transportation projects evaluated, 18 would result in impacts on 8.5 acres of non-wetland waters in the GAI, including 0.1 acre of canal/ditch habitat, 7.8 acres of stream/river habitat, and 0.5 acre of lake/pond habitat (Table 5-7; Caltrans 2023c).

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	Canal/ Ditch	Stream/ River	Lake/ Pond	Total ^b
Middle San Joaquin-Lower Chowchilla	18040001	1	0.0	<0.1	0.0	<0.1
Mono Lake	18090101	1	0.0	0.1	0.0	0.1
Upper Calaveras California	18040011	4	0.0	1.5	0.0	1.5
Upper Carson	16050201	2	0.0	0.2	0.0	0.2
Upper Merced	18040008	2	0.0	0.9	0.0	0.9
Upper Mokelumne	18040012	5	0.1	3.4	0.0	3.5
Upper Stanislaus	18040010	6	<0.1	1.1	0.5	1.6
Upper Tuolumne	18040009	5	<0.1	0.4	0.0	0.5
South Fork American	18020129	1	0.0	<0.1	0.0	<0.1
Total^{b,c}	Not applicable	18	0.1	7.8	0.5	8.5

^a The SAMNA forecasts impacts for 9 of the 17 HUC-8s in the GAI.

^b Totals may be different due to 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 22 SHOPP transportation projects evaluated, 3 would result in impacts on 1.8 acres of vernal pool fairy shrimp habitat and 0.9 acre of vernal pool tadpole shrimp habitat in the GAI (Table 5-8; Caltrans 2023c).

Table 5-8. 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	1	0.9	0.9	0.9
Upper Stanislaus	18040010	1	0.1	0.1	0.1
Upper Tuolumne	18040009	2	0.8	0.0	0.8
Total^{b,c}	Not applicable	3	1.8	0.9	1.8

^a The SAMNA forecasts impacts for 3 of the 17 HUC-8s in the GAI.

^b Totals may be different due to 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 vernal pool habitat.

5.3.5. Estimated Impacts on Areas of Potential Riparian Function

Potential impacts on areas of potential riparian function were estimated using the statewide riparian landcover dataset developed for Caltrans by SFEI (Section 1.4.1; Caltrans 2023d). The analysis consisted of an intersection of assumed transportation project footprints for the 22 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*, with the riparian landcover dataset. Given uncertainties in the dataset, results are shown two ways, based on slope and based on vegetation. Vegetation polygon features used for the analysis are consistent with the SAMNA. Of the 22 SHOPP transportation projects evaluated, 19 could potentially affect 3.83 to 71.89 acres of the areas with potential riparian function (Table 5-9).

Table 5-9. Summary of Estimated SHOPP Project Impacts on Areas of Potential Riparian Function in GAI (acres)^a

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Slope-based Estimate (acres) ^b	Vegetation Process-based Estimate (acres) ^b
Middle San Joaquin-Lower Chowchilla	18040001	1	0.01	0.20
Mono Lake	18090101	1	0.00	0.10
Upper Calaveras California	18040011	6	0.05	18.62
Upper Carson	16050201	3	0.13	0.74
Upper Merced	18040008	2	1.30	2.44
Upper Mokelumne	18040012	7	1.66	27.91
Upper Stanislaus	18040010	7	0.54	5.57
Upper Tuolumne	18040009	5	0.15	16.21
South Fork American	18020129	1	<0.01	0.10
Total^{c,d}		19	3.83	71.89

^a Impacts were estimated for 9 of the 17 HUC-8s in the GAI.

^b Vegetation polygon features used for the analysis are consistent with the SAMNA.

^c Totals may be different due to rounding.

^d Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; some 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.

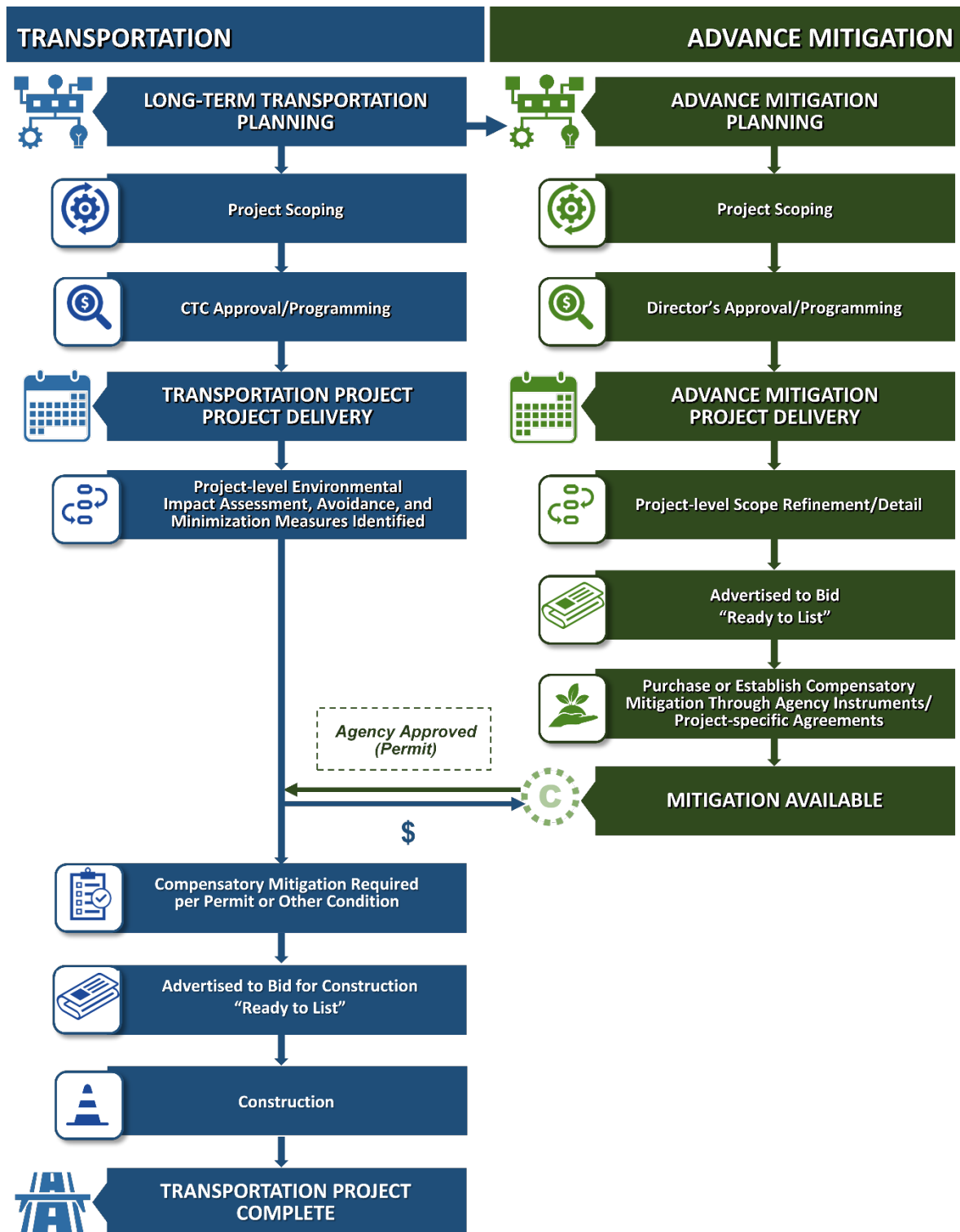
In this chapter, Caltrans summarizes the scheduling considerations and constraints of potential benefiting transportation projects in order to inform advance mitigation project schedules. A time frame for the forecast advance mitigation needs is provided and analyzed. The potentially benefiting transportation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



Note: CTC = California Transportation Commission

The date when a Caltrans potential transportation project is expected to be Ready to List¹ 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 2023/24 through 2032/33 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 therefore, 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 later 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 Tables 6-1 and 6-2 and on Figures 6-2 and 6-3, when the SHOPP transportation projects identified previously have their forecast terrestrial species of mitigation need impacts examined relative to their expected advertising date, the compensatory mitigation needs are spread throughout the 10-year planning period, as described below:
 - Compensatory mitigation needs within the Sierra Nevada Ecoregion Section are concentrated on fiscal years 2027/28 and 2029/30, with additional need for California red-legged frog, foothill yellow-legged frog, Sierra Nevada yellow-legged frog, and California spotted owl spread throughout the remainder of the 10-year planning horizon, with the greatest need for California red-legged frog, foothill yellow-legged frog, and California spotted owl (Table 6-1, Figure 6-2).
 - Compensatory mitigation needs within the Sierra Nevada Foothills Ecoregion Section are concentrated on fiscal year 2032/33, with additional need for California red-legged frog, California tiger salamander, and foothill yellow-legged frog spread throughout the remainder of the 10-year planning horizon, with the greatest need for California red-legged frog, California tiger salamander, and foothill yellow-legged frog (Table 6-2, Figure 6-3).

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.

- As shown in Tables 6-3 through 6-11 and on Figures 6-4 through 6-12, when the SHOPP transportation projects identified previously have their aquatic resource impacts examined relative to their expected advertising date, the compensatory mitigation needs for 9 of the 17 HUC-8 sub-basins are spread throughout the 10-year planning horizon, as described below:
 - Compensatory mitigation needs in the Middle San Joaquin-Lower Chowchilla sub-basin are focused on vernal pool habitat, with lesser impacts to wetlands, non-wetland waters, and areas of potential riparian function in fiscal year 2027/28.
 - Compensatory mitigation needs in the Mono Lake sub-basin are limited to non-wetland waters and areas of potential riparian function in fiscal year 2023/24.
 - Compensatory mitigation needs in the South Fork American sub-basin are focused on non-wetland waters and areas of potential riparian function in fiscal year 2030/31.
 - Compensatory mitigation needs in the Upper Calaveras California sub-basin are focused on areas of potential riparian function in fiscal years 2023/24, 2025/26, 2027/28, 2030/31, and 2032/33, with minor impacts to non-wetland waters in fiscal years 2025/26, 2027/28, 2030/31, and 2032/33 and to wetlands in fiscal year 2032/33.
 - Compensatory mitigation needs in the Upper Carson sub-basin are focused on fish habitat, non-wetland waters, and areas of potential riparian function in fiscal years 2023/24 and 2024/25, with minimal impacts to wetlands in fiscal year 2024/25 and to areas of potential riparian function in fiscal year 2025/26.
 - Compensatory mitigation needs in the Upper Merced sub-basin are focused on non-wetland waters and areas of potential riparian function in fiscal years 2025/26 and 2027/28, with minimal impacts to wetlands in fiscal year 2025/26.
 - Compensatory mitigation needs in the Upper Mokelumne sub-basin are concentrated on fish, wetlands, non-wetland waters, and areas of potential riparian function in fiscal years 2028/29 and 2029/30, with lesser impacts to areas of potential riparian function in fiscal year 2032/33 and minor impacts to fish, non-wetland waters, and areas of potential riparian function in fiscal years 2023/24 and 2025/26.
 - Compensatory mitigation needs in the Upper Stanislaus sub-basin are focused on fish habitat, non-wetland waters, and areas of potential riparian function in fiscal years 2023/24, 2025/26, 2027/28, 2030/31, and 2032/33, with lesser impacts to wetlands in fiscal years 2024/25 and 2032/33 and to vernal pool habitat in fiscal year 2023/24.

- Compensatory mitigation needs in the Upper Tuolumne sub-basin are focused on areas of potential riparian function in fiscal years 2023/24, 2027/28, 2028/29, and 2029/30, with minor impacts to fish habitat and non-wetland waters in fiscal years 2023/24, 2027/28, 2028/29, and 2029/30; to wetlands in fiscal years 2023/24 and 2028/29; and to vernal pool habitat in fiscal years 2027/28 and 2029/30.

Spatially, these transportation projects are distributed throughout the GAI (Figure 6-13).

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

Expected Advertisement Year	California Red- legged Frog: Number of Transportation Projects	California Red- legged Frog: Estimated Potential Impacts (acres)	California Tiger Salamander: Number of Transportation Projects	California Tiger Salamander: Estimated Potential Impacts (acres)	Foothill Yellow- legged Frog: Number of Transportation Projects	Foothill Yellow- legged Frog: Estimated Potential Impacts (acres)	Sierra Nevada Yellow-legged Frog: Number of Transportation Projects	Sierra Nevada Yellow-legged Frog: Estimated Potential Impacts (acres)	Western Spadefoot: Number of Transportation Projects	Western Spadefoot: Estimated Potential Impacts (acres)	California Spotted Owl: Number of Transportation Projects	California Spotted Owl: Estimated Potential Impacts (acres)
2023/24	1	0.4	0	0.0	1	0.4	4	1.8	0	0.0	3	1.0
2024/25	0	0.0	0	0.0	0	0.0	1	0.0	0	0.0	0	0.0
2025/26	2	1.9	1	0.6	1	2.0	2	1.5	0	0.0	2	1.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	1	23.5	0	0.0	1	25.5	1	21.3	0	0.0	1	21.3
2028/29	1	0.4	0	0.0	1	0.4	0	0.0	0	0.0	0	0.0
2029/30	1	32.2	0	0.0	1	32.2	0	0.0	0	0.0	1	20.6
2030/31	1	0.9	0	0.0	1	1.3	2	1.1	0	0.0	1	1.2
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total^a	7	59.3	1	0.6	6	61.8	10	25.7	0	0.0	8	45.1

^a Total may be different due to rounding.

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

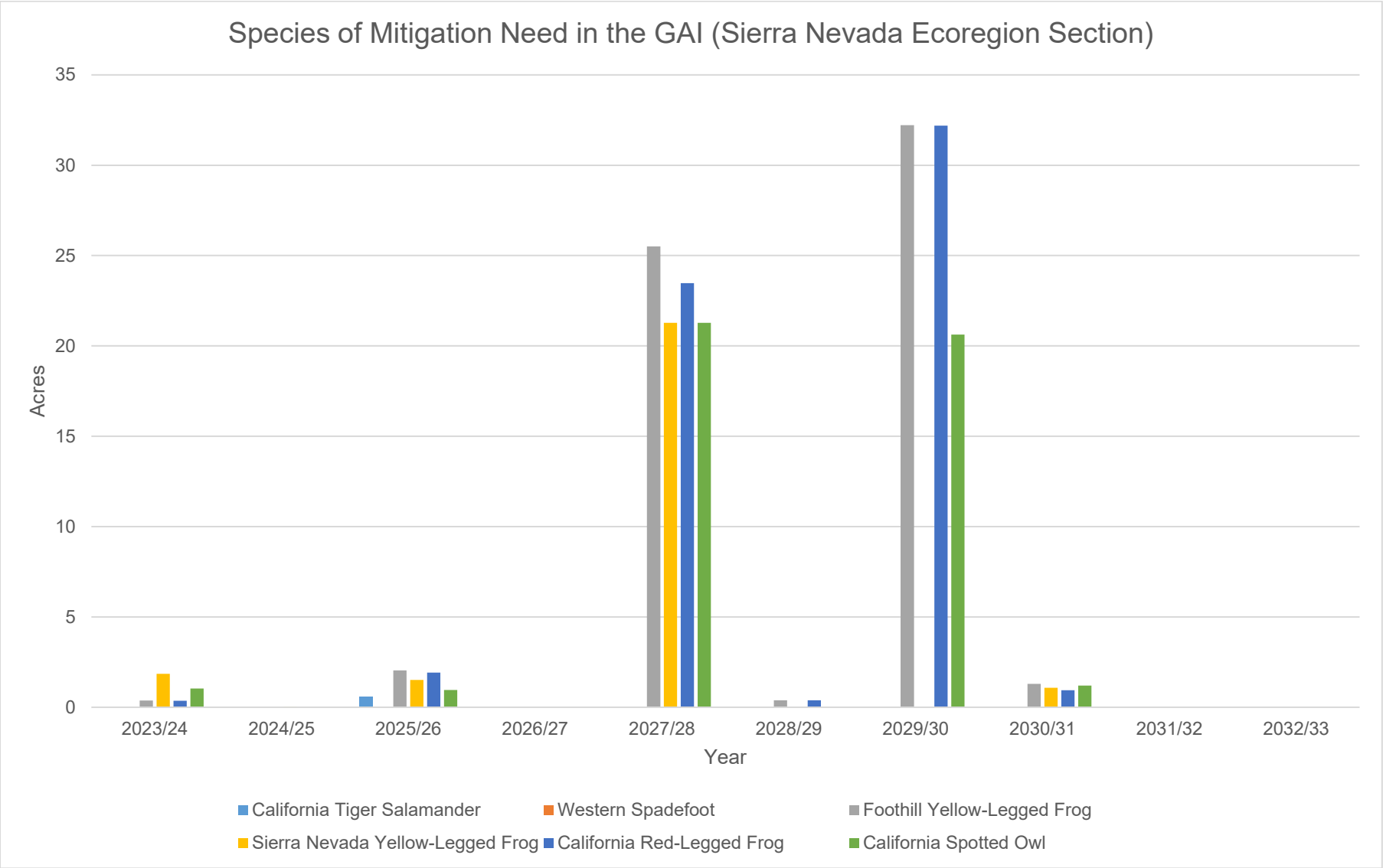


Table 6-2. Sierra Nevada Foothills Ecoregion Section: Estimated Impacts on Terrestrial Species of Mitigation Need in the GAI, by Transportation Project Delivery Year

Expected Advertisement Year	California Red- legged Frog: Number of Transportation Projects	California Red- legged Frog: Estimated Potential Impacts (acres)	California Tiger Salamander: Number of Transportation Projects	California Tiger Salamander: Estimated Potential Impacts (acres)	Foothill Yellow- legged Frog: Number of Transportation Projects	Foothill Yellow- legged Frog: Estimated Potential Impacts (acres)	Sierra Nevada Yellow-legged Frog: Number of Transportation Projects	Sierra Nevada Yellow-legged Frog: Estimated Potential Impacts (acres)	Western Spadefoot: Number of Transportation Projects	Western Spadefoot: Estimated Potential Impacts (acres)	California Spotted Owl: Number of Transportation Projects	California Spotted Owl: Estimated Potential Impacts (acres)
2023/24	3	1.9	3	1.7	3	1.9	0	0.0	3	1.6	3	0.3
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	1	0.6	1	0.3	1	0.6	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	0	0.0
2027/28	2	9.5	2	8.1	2	9.7	0	0.0	1	1.2	2	0.9
2028/29	2	15.2	2	14.8	2	15.2	0	0.0	0	0.0	2	4.8
2029/30	2	18.7	2	12.3	2	18.7	0	0.0	0	0.0	1	7.3
2030/31	2	0.8	2	0.5	2	0.8	0	0.0	1	0.1	2	0.4
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2032/33	1	73.9	1	71.8	1	73.4	1	0.5	1	1.1	1	24.1
Total ^a	13	120.6	13	109.6	13	120.3	1	0.5	6	4.0	12	37.9

^a Total may be different due to rounding.

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

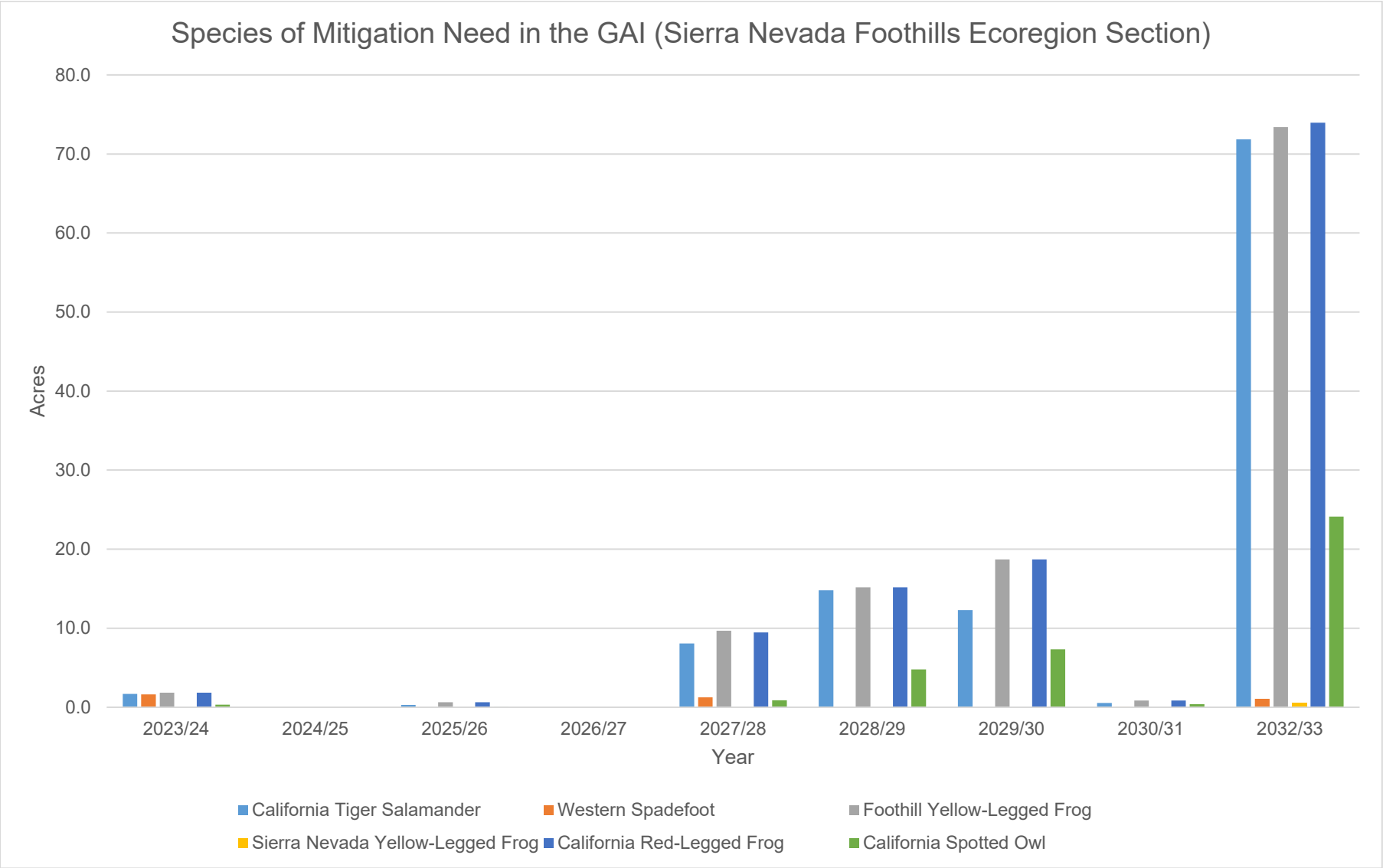


Table 6-3. Middle San Joaquin-Lower Chowchilla Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Advertisement 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)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Slope-based Riparian: Estimated Potential Impacts (acres)	Vegetation Process-based Riparian: Estimated Potential Impacts (acres)
2023/24	0	0.0	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	0.0
2025/26	0	0.0	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	0.0
2027/28	0	0.0	1	<0.1	1	<0.1	1	0.9	1	<0.1	0.2
2028/29	0	0.0	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	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Total ^a	0	0.0	1	<0.1	1	<0.1	1	0.9	1	<0.1	0.2

^a Total may be different due to rounding.

Figure 6-4. Middle San Joaquin-Lower Chowchilla Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

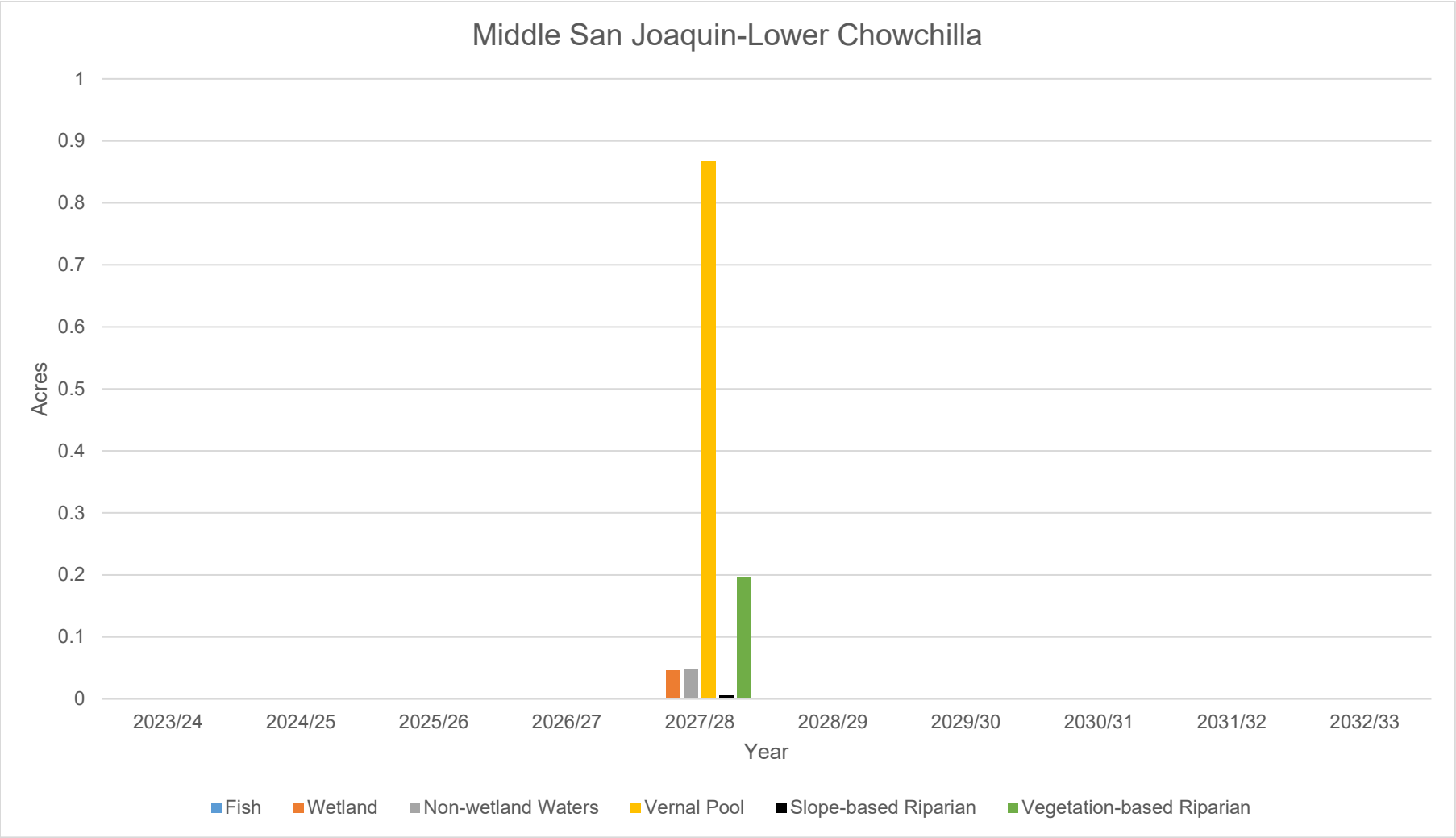


Table 6-4. Mono Lake Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Advertisement 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)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Slope-based Riparian: Estimated Potential Impacts (acres)	Vegetation Process-based Riparian: Estimated Potential Impacts (acres)
2023/24	0	0.0	0	0.0	1	0.1	0	0.0	1	0.0	0.1
2024/25	0	0.0	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	0.0
2026/27	0	0.0	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	0.0
2028/29	0	0.0	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	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Total ^a	0	0.0	0	0.0	1	0.1	0	0.0	1	0.0	0.1

^a Total may be different due to rounding.

Figure 6-5. Mono Lake Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

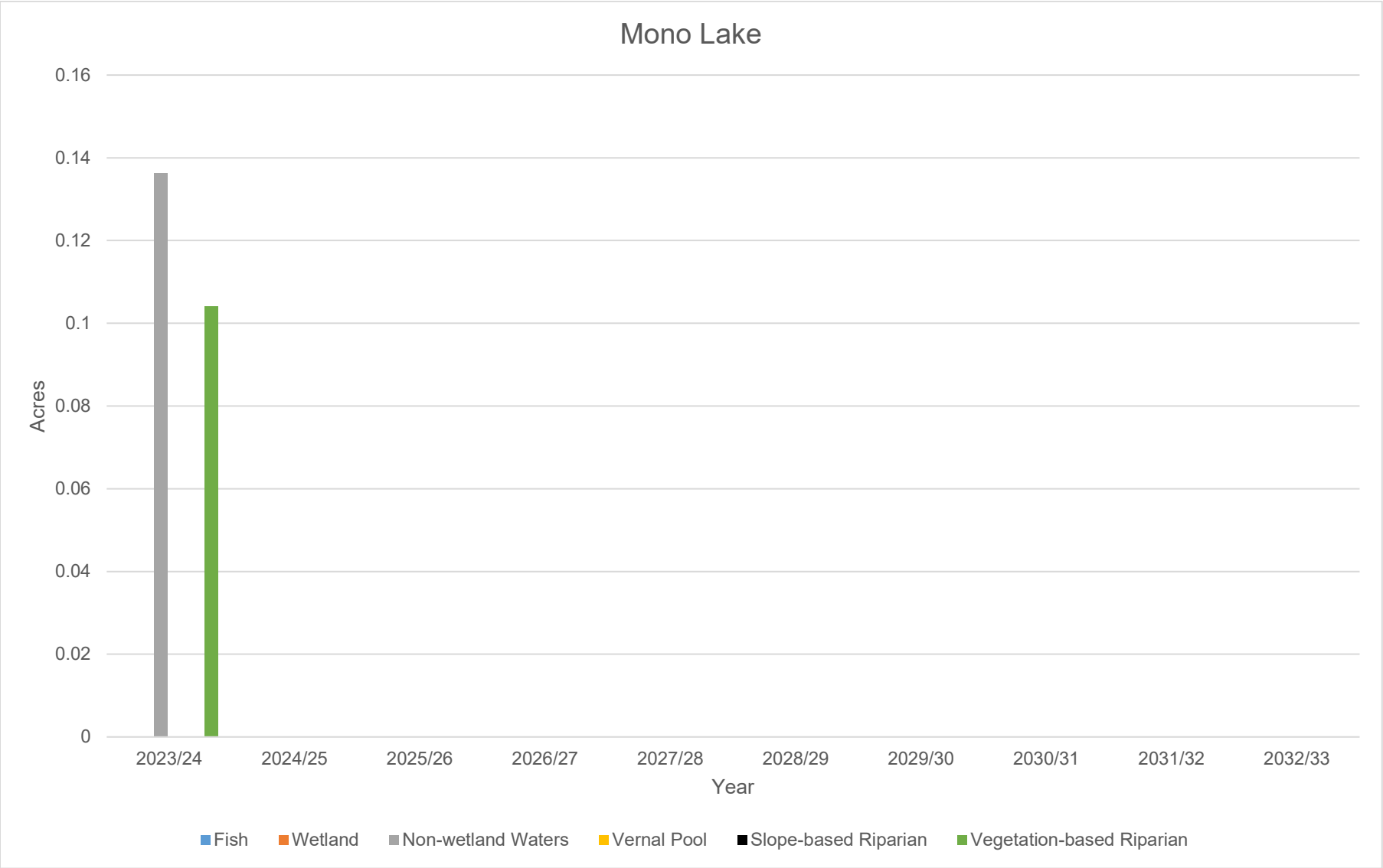


Table 6-5. South Fork American Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Advertisement 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)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Slope-based Riparian: Estimated Potential Impacts (acres)	Vegetation Process-based Riparian: Estimated Potential Impacts (acres)
2023/24	0	0.0	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	0.0
2025/26	0	0.0	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	0.0
2027/28	0	0.0	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	0.0
2029/30	0	0.0	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	1	0.0	0.1
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Total ^a	0	0.0	0	0.0	1	0.1	0	0.0	1	0.0	0.1

^a Total may be different due to rounding.

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

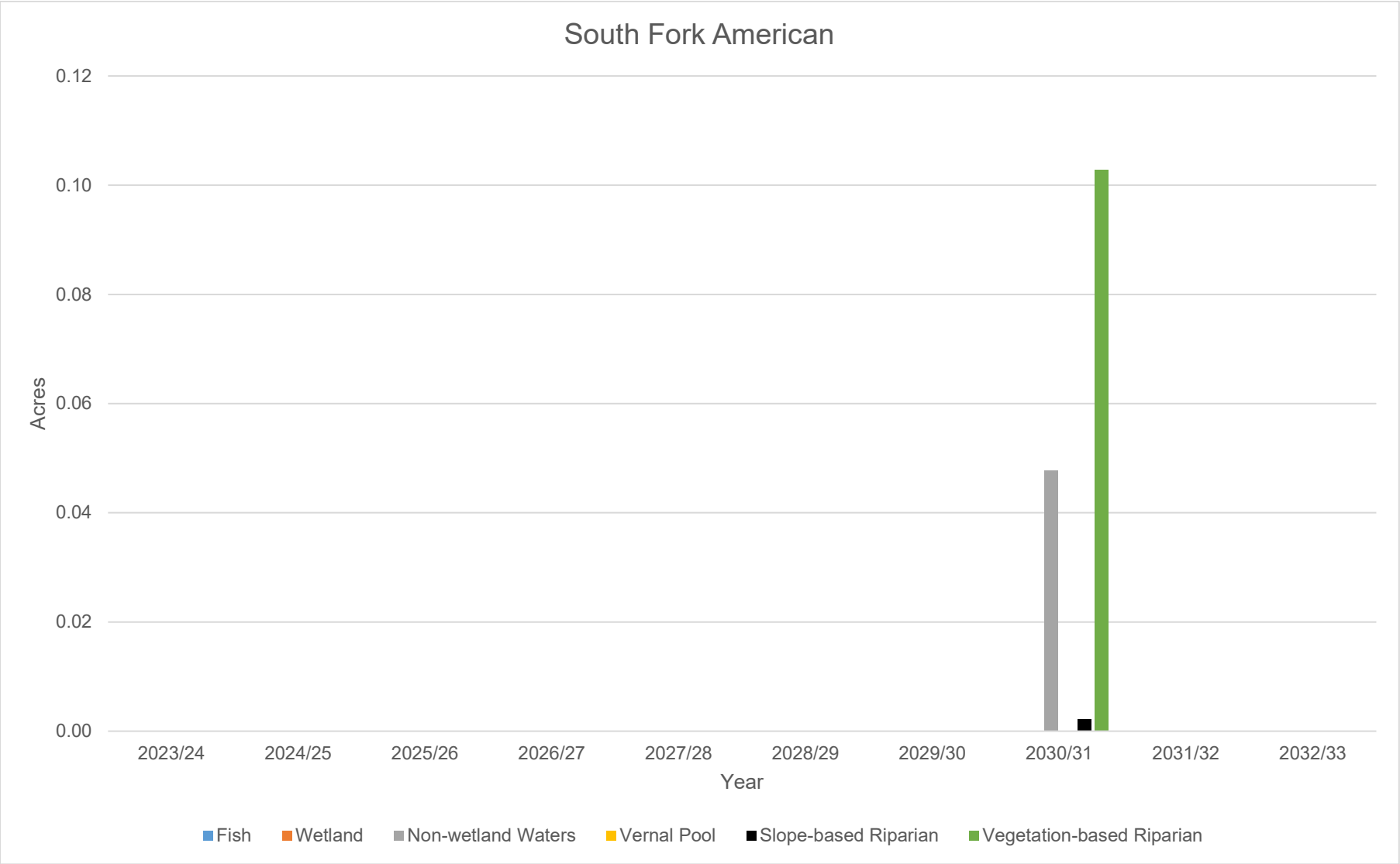


Table 6-6. Upper Calaveras California Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Advertisement 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)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Slope-based Riparian: Estimated Potential Impacts (acres)	Vegetation Process-based Riparian: Estimated Potential Impacts (acres)
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	2	0.0	1.7
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2025/26	0	0.0	0	0.0	1	0.1	0	0.0	1	0.0	0.6
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2027/28	0	0.0	0	0.0	1	<0.1	0	0.0	1	0.0	2.1
2028/29	0	0.0	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	0.0
2030/31	0	0.0	0	0.0	1	<0.1	0	0.0	1	<0.1	0.4
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2032/33	0	0.0	1	0.3	1	1.3	0	0.0	1	<0.1	13.7
Total ^a	0	0.0	1	0.3	4	1.5	0	0.0	6	<0.1	18.5

^a Total may be different due to rounding.

Figure 6-7. Upper Calaveras California Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

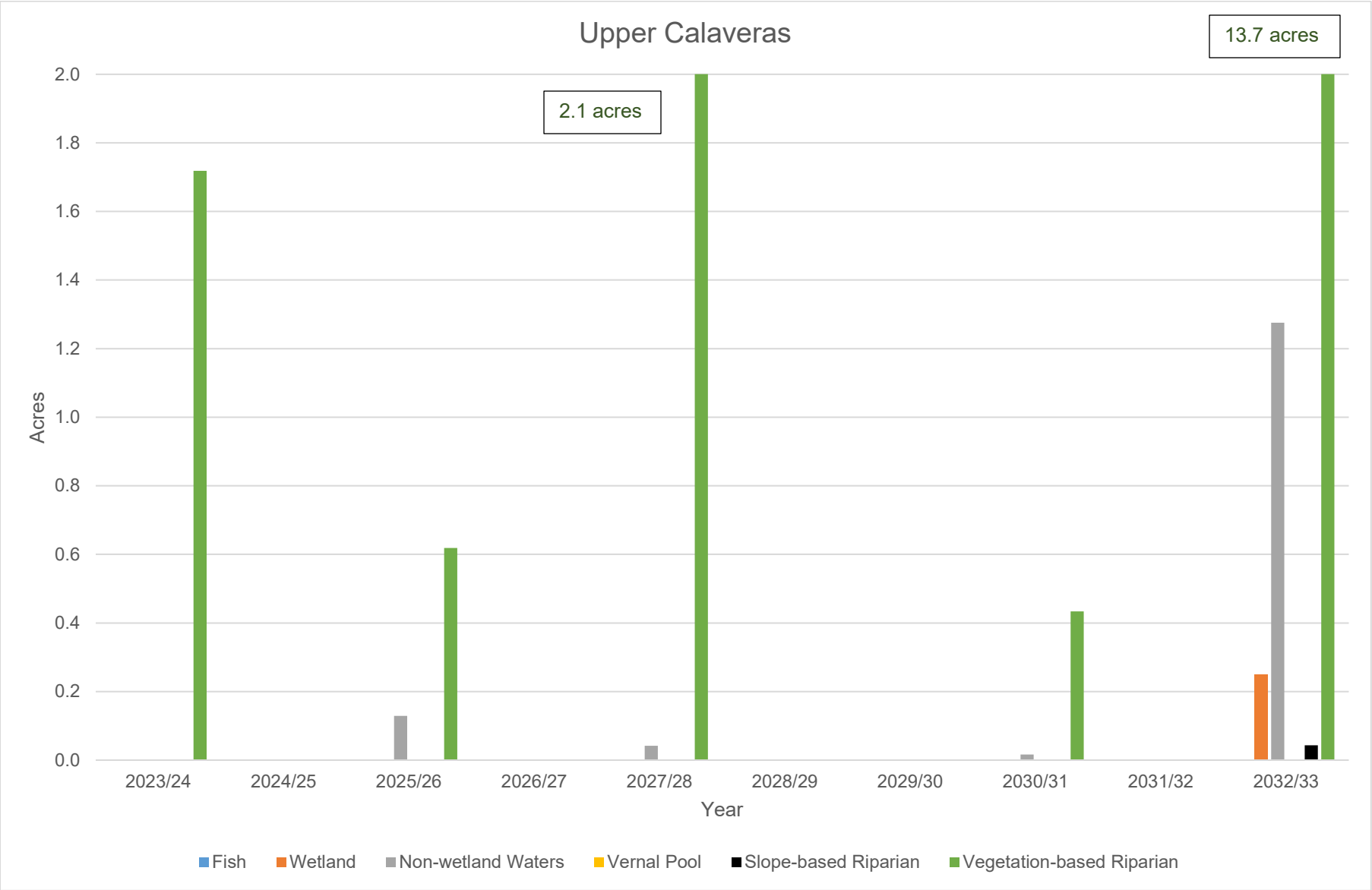


Table 6-7. Upper Carson Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Advertisement 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)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Slope-based Riparian: Estimated Potential Impacts (acres)	Vegetation Process-based Riparian: Estimated Potential Impacts (acres)
2023/24	1	0.1	0	0.0	1	0.1	0	0.0	1	<0.1	0.2
2024/25	1	0.1	1	<0.1	1	0.2	0	0.0	1	0.1	0.5
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	1	0.0	<0.1
2026/27	0	0.0	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	0.0
2028/29	0	0.0	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	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Total ^a	2	0.2	1	<0.1	2	0.2	0	0.0	3	0.1	0.7

^a Total may be different due to rounding.

Figure 6-8. Upper Carson Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

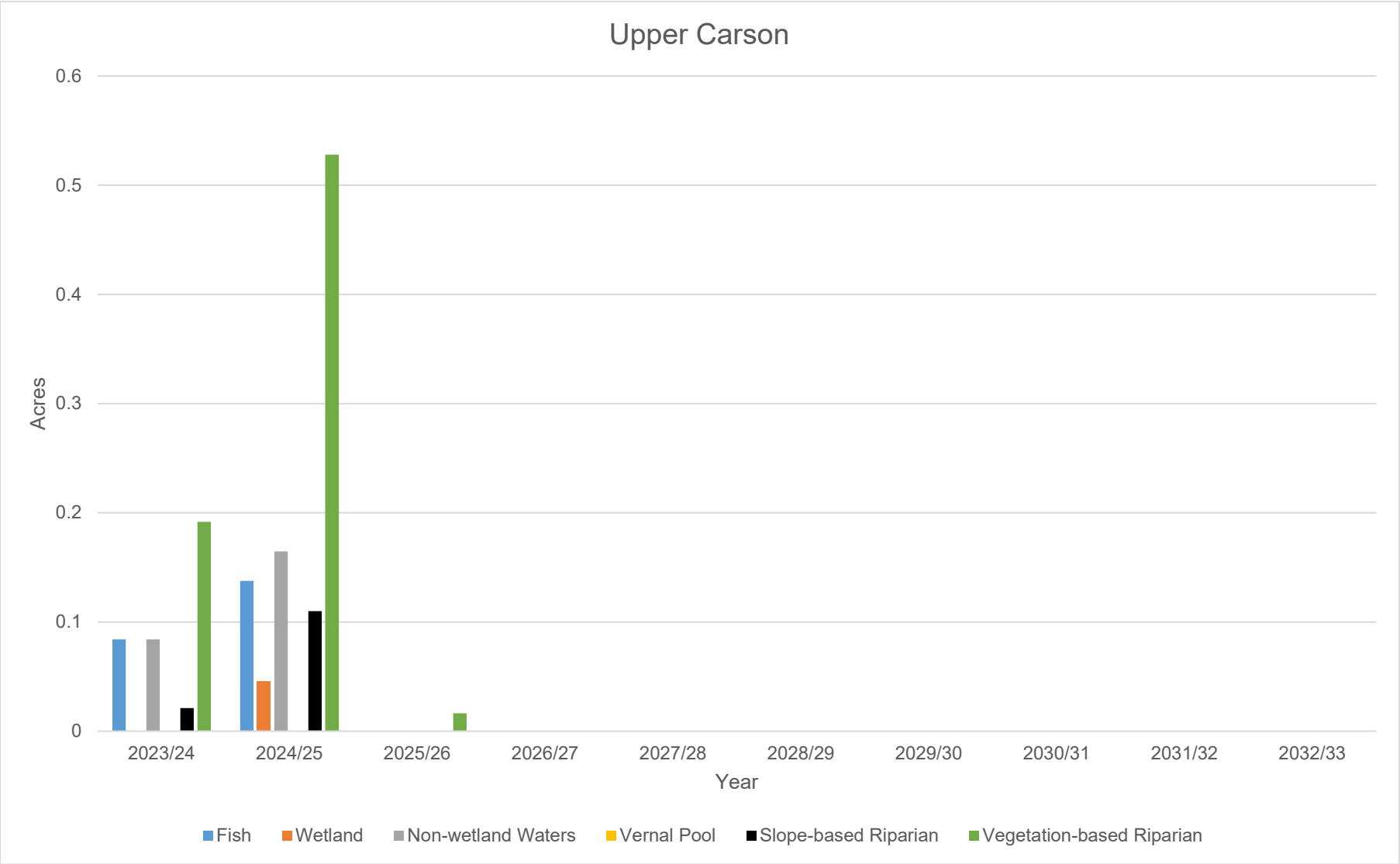


Table 6-8. Upper Merced Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Advertisement 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)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Slope-based Riparian: Estimated Potential Impacts (acres)	Vegetation Process-based Riparian: Estimated Potential Impacts (acres)
2023/24	0	0.0	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	0.0
2025/26	0	0.0	1	<0.1	1	0.7	0	0.0	1	0.9	2.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2027/28	0	0.0	0	0.0	1	0.3	0	0.0	1	0.5	0.5
2028/29	0	0.0	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	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Total ^a	0	0.0	1	<0.1	2	0.9	0	0.0	2	1.3	2.4

^a Total may be different due to rounding.

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

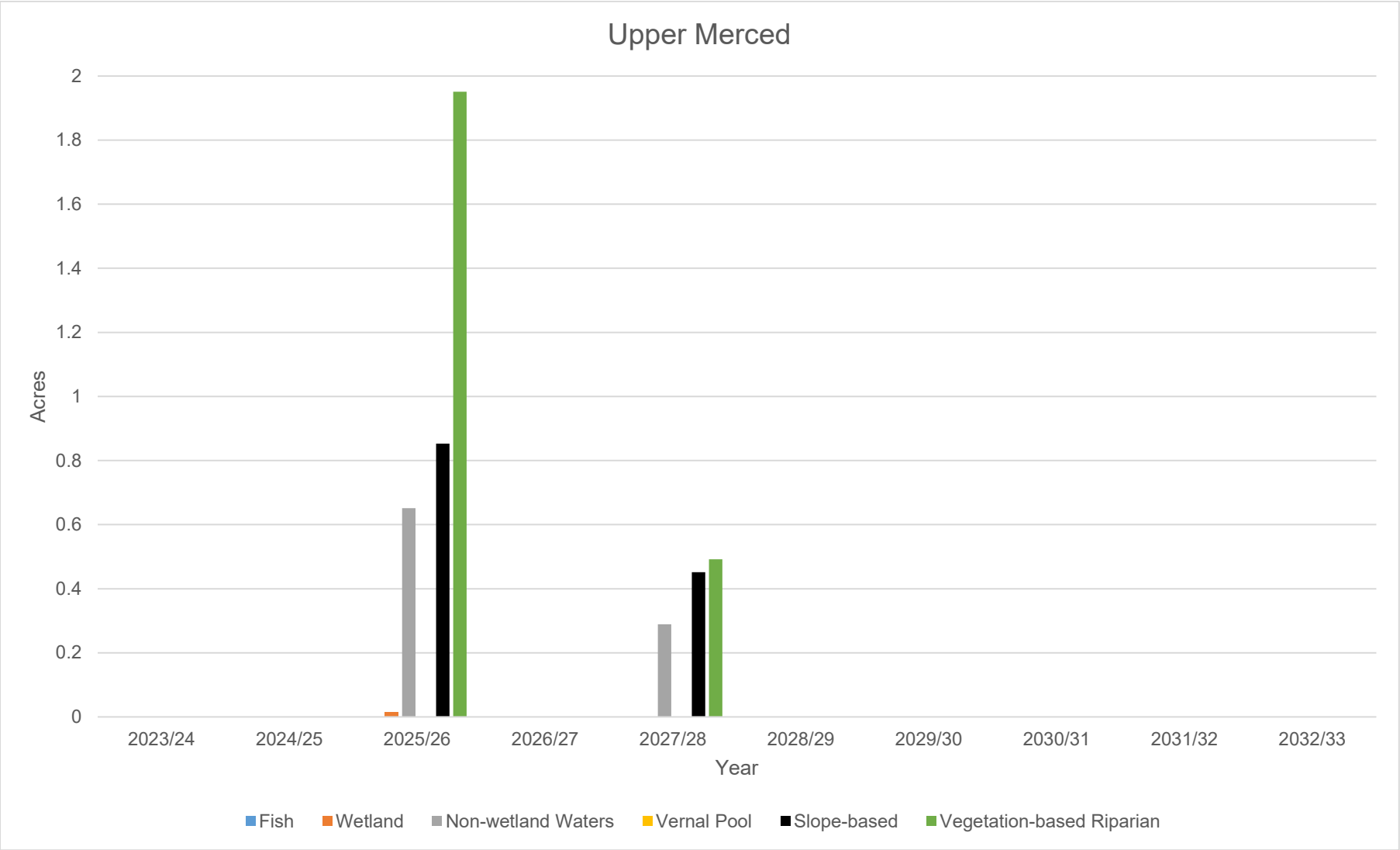


Table 6-9. Upper Mokelumne Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Advertisement 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)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Slope-based Riparian: Estimated Potential Impacts (acres)	Vegetation Process-based Riparian: Estimated Potential Impacts (acres)
2023/24	2	0.1	0	0.0	2	0.1	0	0.0	3	<0.1	0.3
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2025/26	1	<0.1	0	0.0	1	<0.1	0	0.0	1	<0.1	0.1
2026/27	0	0.0	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	0.0
2028/29	1	2.6	1	0.4	1	2.6	0	0.0	1	0.7	11.1
2029/30	1	0.6	1	0.4	1	0.7	0	0.0	1	0.7	13.8
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	1	0.3	2.6
Total ^a	5	3.3	2	0.7	5	3.5	0	0.0	7	1.7	27.9

^a Total may be different due to rounding.

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

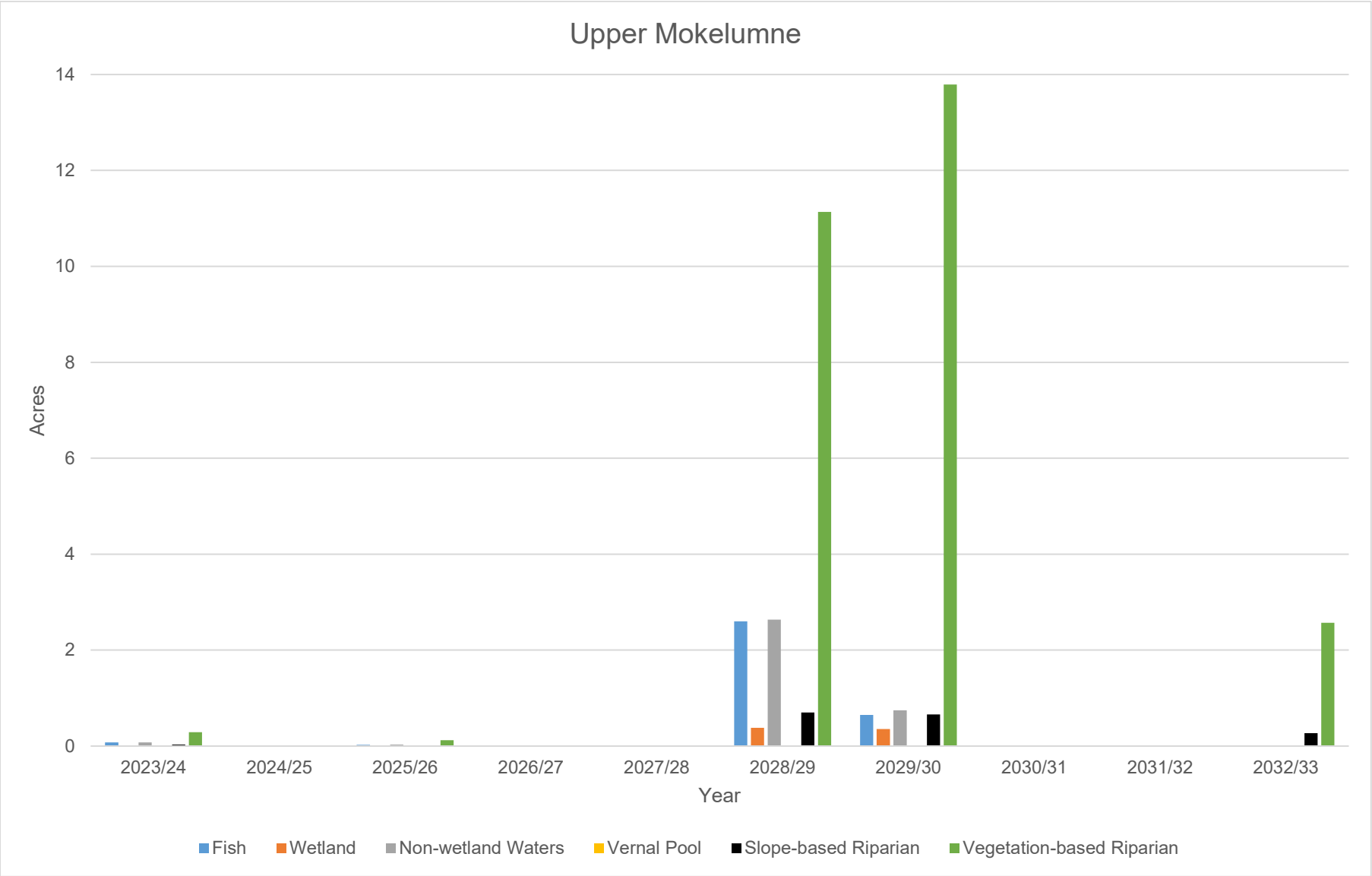


Table 6-10. Upper Stanislaus Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Advertisement 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)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Slope-based Riparian: Estimated Potential Impacts (acres)	Vegetation Process-based Riparian: Estimated Potential Impacts (acres)
2023/24	2	0.2	0	0.0	2	0.1	1	0.1	2	0.1	0.2
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2025/26	1	<0.1	1	0.1	1	<0.1	0	0.0	2	0.1	0.1
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2027/28	1	0.1	0	0.0	1	0.1	0	0.0	1	<0.1	0.5
2028/29	0	0.0	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	0.0
2030/31	1	0.1	0	0.0	1	0.1	0	0.0	1	0.0	0.9
2031/32	1	1.2	1	<0.1	1	1.2	0	0.0	0	0.0	0.0
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	3.9
Total ^a	6	1.6	2	0.1	6	1.6	0	0.0	7	0.5	5.6

^a Total may be different due to rounding.

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

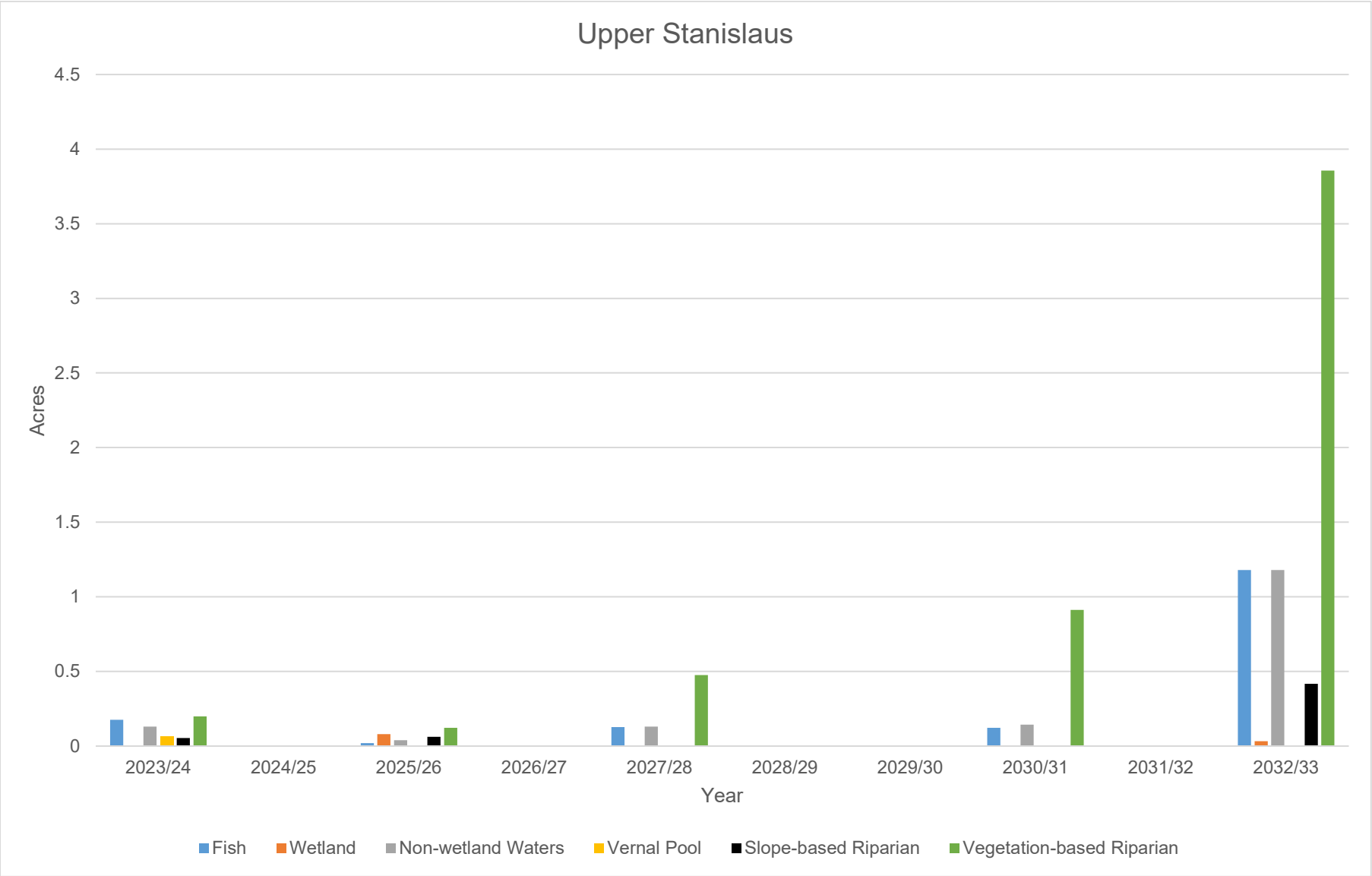


Table 6-11. Upper Tuolumne Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

Expected Advertisement 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)	Vernal Pools: Number of Transportation Projects	Vernal Pools: Estimated Potential Impacts (acres)	Riparian: Number of Transportation Projects	Slope-based Riparian: Estimated Potential Impacts (acres)	Vegetation Process-based Riparian: Estimated Potential Impacts (acres)
2023/24	1	<0.1	1	0.1	1	<0.1	0	0.0	1	0.0	0.3
2024/25	0	0.0	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	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2027/28	1	0.2	0	0.0	2	0.2	1	0.3	2	0.1	12.0
2028/29	1	0.2	1	0.1	1	0.2	0	0.0	1	0.1	3.0
2029/30	1	0.1	0	0.0	1	0.1	1	0.5	1	0.0	0.8
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2031/32	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Total ^a	4	0.4	2	0.2	5	0.5	2	0.8	5	0.1	16.2

^a Total may be different due to rounding.

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

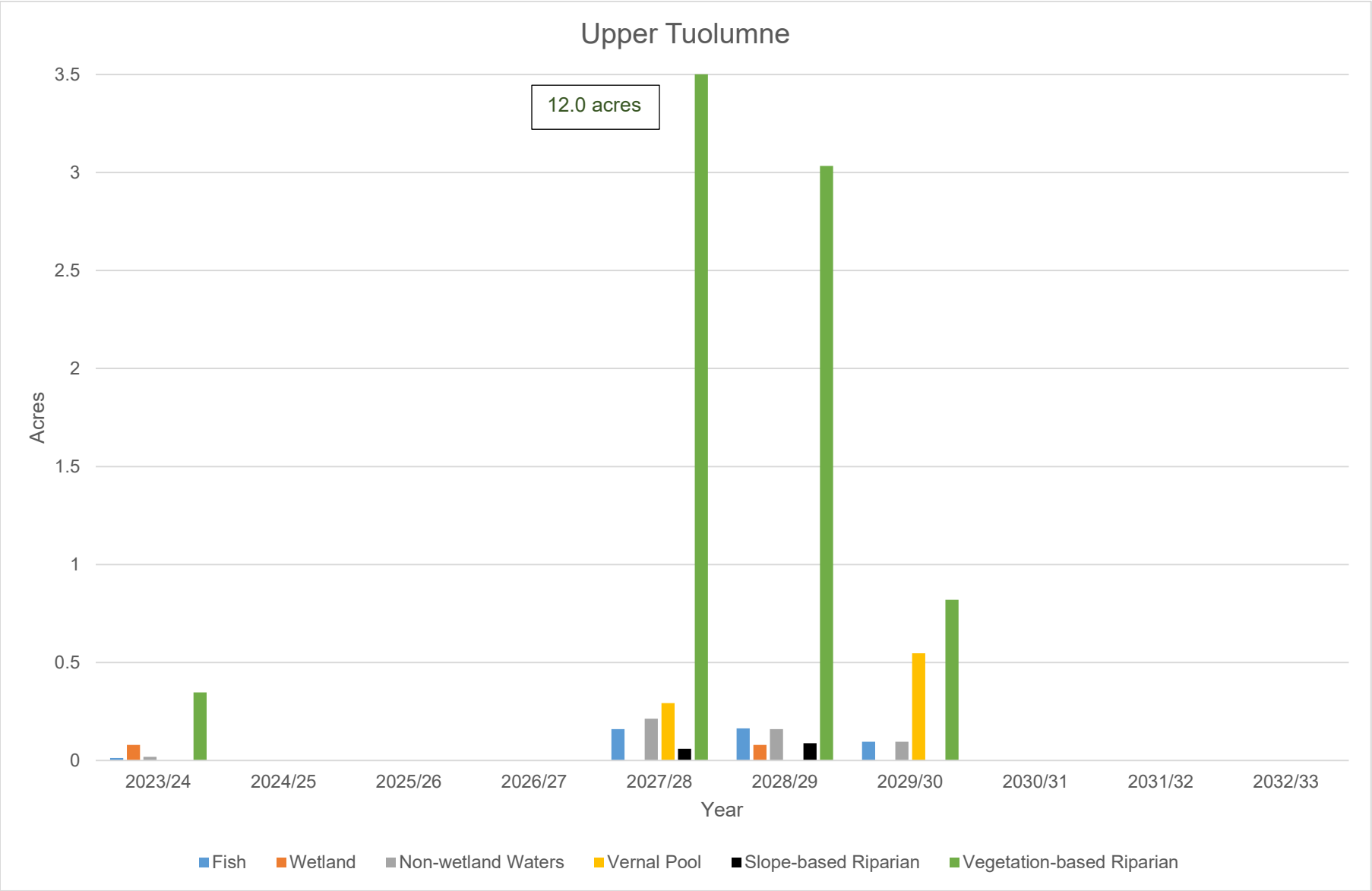
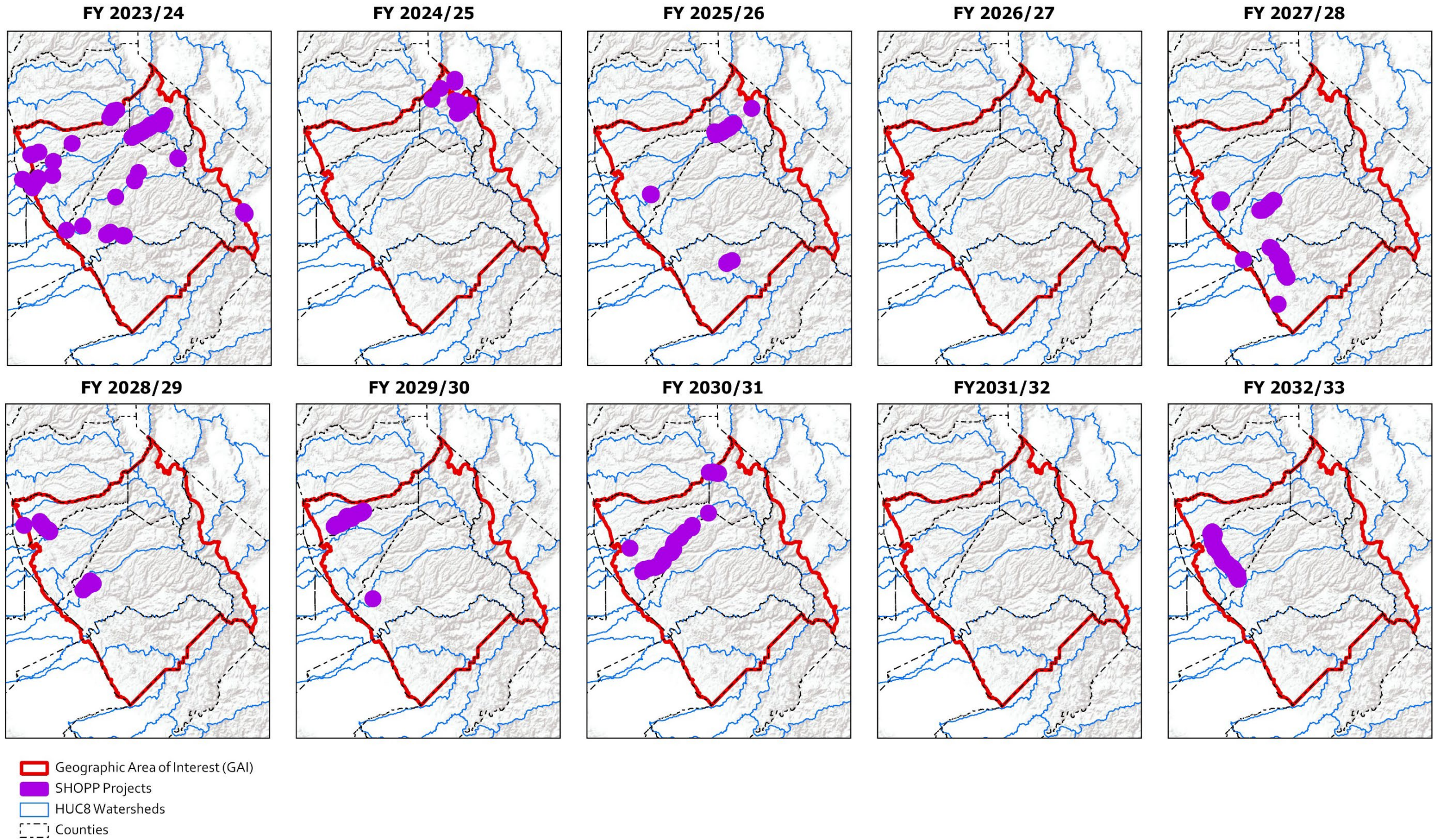


Figure 6-13. Location of SHOPP Estimated Impacts, by Transportation Project Delivery Year



Sources: Esri, USGS, NOAA, USGS

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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 as well as 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 2022b). This prioritization is expressed in each update of the SHS Management Plan (Caltrans 2023i).

Impact forecasts presented herein are based on the transportation project sequencing provided in the 2023/24–2032/33 (Quarter 1) SHOPP Ten-Year Book (Figure 6-13). Since it was published, however, the transportation project delivery schedules may have changed, or the projects have been discontinued. The 2023 SHS Management Plan gave Caltrans District 10 targets and funding for 495 lane miles of fair (Class 1) pavement. In other words, at this time, District 10's priorities are to develop projects that upgrade its 495 lane miles of roadways from fair condition to good condition. Prior to proposing advance mitigation projects, District 10 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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7. WILDLIFE RESOURCES CONSERVATION GOALS AND OBJECTIVES

Caltrans' primary objective for wildlife resources is to avoid and minimize all impacts on special-status species from Caltrans transportation projects in the GAI. However, 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 in 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 wildlife 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 wildlife resource protection and enhancement, and should yield compensatory mitigation usable by future transportation projects, as specified in SHC § 800.¹ Compensatory mitigation usable by future transportation projects should be expressed in standard units or terms recognized by the natural resource regulatory agencies.

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

7.1 Approach

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

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 wildlife 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 wildlife resource-related compensatory mitigation in the GAI.
- Then, in Section 7.3, summarizes the life history information for the six 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 as well as 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, and
 - opportunities to benefit other special-status and native 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 Wildlife Resources Oversight

Table 7-1 lists the natural resource regulatory agencies with the authority to condition transportation projects delivered in the GAI with wildlife 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 Wildlife Resource Compensatory Mitigation Credits (or Values)

Agency ^a	Summary
CDFW	CDFW oversees the conservation, protection, and management of fish, wildlife, native plants, and 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 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, conservation and mitigation bank approvals, MCA and RCIS approvals, 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 FESA. 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 FESA requires that the impact of any incidental take be minimized and mitigated to the maximum extent practicable. Section 7(a)(1) of the FESA 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. Conservation banking can assist federal and non-federal participants in the Section 7 and 10 processes. 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 Sections 7 and 10 of the FESA 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- and/or off-site. Purchasing credits in conservation banks is one method of protecting habitat on- or off-site.
NMFS	NMFS has jurisdiction over marine species listed as threatened or endangered under the FESA. Federal agencies must consult with NMFS to ensure that their actions do not jeopardize the continued existence of FESA-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 FESA 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.

Note: EFH = Essential Fish Habitat

^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. See Chapter 2, *Environmental Setting*, for beneficial uses relevant to the GAI and wildlife.

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 California red-legged frog, California tiger salamander, foothill yellow-legged frog, Sierra Nevada yellow-legged frog, western spadefoot, and California spotted owl. Each species is briefly described below.

7.3.1. California Red-legged Frog

California red-legged frog is a federally threatened amphibian species and a California species of special concern that has been extirpated from 70 percent of its historical range. Most California red-legged frog occurrences have been recorded below 3,500 feet; however, they can be found from sea level up to elevations of 5,200 feet (FWS 2002). Eight Recovery Units were established by the *Recovery Plan for the California Red-legged Frog* (FWS 2002). The GAI falls within the Sierra Nevada Foothills and Central Valley California red-legged frog Recovery Unit.

California red-legged frog habitat consists of the following components: aquatic breeding habitat, non-breeding aquatic habitat, upland habitat, and dispersal habitat. Aquatic breeding habitat includes natural or artificial, ephemeral or permanent standing bodies of freshwater, slow-moving streams, or pools within streams that can sustain all the aquatic life stages of the species. These areas must hold water for at least 20 weeks during the year, which is the minimum amount of time needed for breeding and tadpole development and metamorphosis (*Federal Register* 2010; Hayes and Jennings 1988). It is also critical that aquatic breeding habitat for the species be free of predatory bullfrogs, or at least provide sufficient vegetative cover as protection from predation. Ephemeral aquatic features often prove to be better breeding habitat for California red-legged frogs because the drying period helps to prevent establishment of bullfrog populations.

Non-breeding aquatic habitat includes springs, seeps, moist cracks within dried ponds, and vegetated areas growing within the floodplains of rivers and streams. These areas do not hold enough water for frog breeding but provide cover and space needed for foraging and dispersal to other breeding habitats, and they are particularly important during drought periods (Alvarez 2004; *Federal Register* 2010).

Upland habitat consists of areas where California red-legged frogs can seek shelter, such as under boulders, rocks, animal burrows, fallen logs, and agricultural debris such as watering troughs and haystacks (*Federal Register* 2010; Jennings and Hayes 1994). Upland habitats are also important because they buffer aquatic habitats from degradation and provide space for foraging, sheltering, and avoiding predation (*Federal Register* 2010).

Dispersal habitats are the least clearly defined component of California red-legged frog habitat but are nevertheless very important to the survival of the species. They are migration corridors that allow the frogs to disperse overland to and from breeding sites,

sometimes as far as 1.5 miles apart. Dispersal habitat can take many forms; a riparian woodland corridor between aquatic breeding habitat and upland refugia provides a more obvious dispersal opportunity; however, in some areas California red-legged frogs may make use of pastures, row crop fields, or other less natural habitats for dispersal.

7.3.2. California Tiger Salamander

The central California DPS of California tiger salamander is a federally and state-threatened amphibian. Historically, this DPS occurred in the valleys and bordering foothills of the Central Valley and Inner Coast Range from San Luis Obispo, Kern, and Tulare Counties in the south to Sacramento and Yolo Counties in the north (FWS 2017b). Most of the historical Central Valley populations of this California endemic species have been extirpated (FWS 2017b). Typical habitat associations include grassland, oak savanna, and edges of mixed woodland and lower-elevation coniferous forest (FWS 2017b). The species can also be found in other habitats that occur adjacent to preferred habitat types, such as orchards and residential areas. 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 need both suitable upland habitat for refuge and aquatic habitat for breeding and larval development. Historical California tiger salamander breeding habitat was primarily natural vernal pools and ponds, but now includes modified ephemeral and permanent ponds such as livestock ponds (FWS 2017b). Optimal breeding ponds are ephemeral, forming during winter and drying during summer, and free of predatory non-native fish and bullfrogs (FWS 2017b). California tiger salamanders are nocturnal and spend most of their life underground (FWS 2017b). They rely on networks of underground burrows created by species such as Botta's pocket gopher (*Thomomys bottae*), California ground squirrel (*Otospermophilus beecheyi*), and moles (*Scapanus* spp.) for refuge (FWS 2017b).

7.3.3. Foothill Yellow-legged Frog

Foothill yellow-legged frog is a middle-elevation frog species for which there are six recognized DPSs. The GAI falls within the south Sierra DPS, which is listed as federally and state endangered. This stream-dwelling frog species occurs in California from the Oregon border along the Coast Ranges to the San Gabriel Mountains in southern California, and south along the foothills of the western side of the Sierra Nevada to the edge of the Tehachapi Mountains (Stebbins and McGinnis 2012).

Typical habitat for this species includes shallow, flowing water in streams and rivers containing cobble-sized substrate (Jennings and Hayes 1994). Breeding and oviposition (egg laying) occurs along the margins of relatively shallow and wide portions of the channel. Stream morphology is a strong predictor of the presence of the species because the right fluvial microhabitat elements provide the right conditions for successful egg-laying, hatching, growth, and metamorphosis (FWS 2023a). Egg masses are attached to cobble, boulder, bedrock, and occasionally wood and vegetative substrate in shallow,

slow-moving portions of streams. Females lay 1 egg mass per year, containing approximately 1,000 to 2,500 eggs. Metamorphosed individuals use a variety of aquatic habitat types, including pools, riffles, and glides (Thomson et al. 2016). During fall and winter, non-breeding habitat typically includes small tributary streams with perennial flow (Bourque 2008; Gonsolin 2010; Kupferberg 1996). Woody debris, root wads, undercut banks, clumps of sedges, and large boulders at high waterlines can offer refuge from high winter flows. Little is known about home range and territoriality during the non-breeding season, but some study results suggest that foothill yellow-legged frogs tend to be sedentary outside the breeding season (FWS 2023a).

7.3.4. Sierra Nevada Yellow-legged Frog

Sierra Nevada yellow-legged frog is a federally endangered and state-threatened species that can be found in lakes, ponds, marshes, meadows, and streams of the Sierra Nevada range at elevations of 4,500 to 12,000 feet (*Federal Register* 2014). This species is highly aquatic and not usually found more than 3.3 feet away from water (Stebbins 1951). At lower elevations, Sierra Nevada yellow-legged frog is associated with rocky streambed and wet meadow habitats surrounded by coniferous forests (Zeiner et al. 1988). At higher elevations, the species tends to be found in lakes, ponds, and streams (Mullally and Cunningham 1956). The species is most abundant at high-elevation lakes and slow-moving streams with grassy banks bordered by exposed glaciated bedrock.

Breeding occurs in the shallows of still lakes, ponds, and flowing inlet streams. Frogs deposit eggs underwater attached to rocks, gravel, vegetation, or under banks (Pope 1999). Breeding occurs immediately following snowmelt when the frogs emerge from overwintering sites, which are underneath ice in lakes and streams. The species exhibits strong site fidelity and return to the same overwintering and breeding sites year after year (Matthews and Pope 1999).

7.3.5. Western Spadefoot

Western spadefoot is a California species of special concern and was proposed for listing as federally threatened by FWS in December 2023. The Species Status Assessment Report issued by FWS identified northern and southern DPS of western spadefoot, and the GAI overlaps with the range for the northern DPS. Western spadefoot is endemic to California and northern Baja California. It ranges throughout the Central Valley and its foothills. In coastal ranges, it can be found from Santa Barbara County south to the Mexican border. It can range in elevation from near sea level to 4,471.8 feet within some areas of the southern Sierra foothills but is most often found below 1,197.5 feet (Green et al. 2014). Western spadefoot occurs primarily in grasslands, but some populations also occasionally occur in valley-foothill hardwood woodlands. In the northern portion of its range, including the Sacramento Valley and its surrounding foothills, this species is largely restricted to vernal pool grassland and open blue oak (*Quercus douglasii*) woodlands (Shedd 2016). Some populations can persist for a few years in orchard or vineyard habitats (CDFW 2000).

Western spadefoot breeding habitat includes vernal pools and other temporary water sources, and slow-moving streams, but can also include anthropogenic structures such as stock tanks if the surrounding habitat is still suitable and undeveloped (International Union for the Conservation of Nature 2022). A nocturnal species, they are rarely seen, largely because they spend most of their time in burrows that they dig with the hardened spades on their hind feet (Nafis 2023). They are only active for a short period of time each year, between October and May, depending heavily on the amount of rainfall during this time (Nafis 2023).

7.3.6. California Spotted Owl

California spotted owl is a subspecies of spotted owl that FWS proposed for listing in February 2023 (*Federal Register* 2023). It occurs throughout the Sierra Nevada in California and Nevada (Sierra Nevada DPS), and along the central California coast in the Coast and Transverse Ranges from Monterey County south into Ventura County, in southern California in the Transverse and Peninsular mountain ranges from Ventura County to San Diego County, and historically as far south as Baja California (Coastal-Southern California DPS). In the *Federal Register* document cited above, FWS proposed listing the Coastal-Southern California DPS as endangered and the Sierra Nevada DPS as threatened. Only the Sierra Nevada DPS occurs in the GAI (FWS 2022).

In the Sierra Nevada, a majority of California spotted owls occur within mid-elevation ponderosa pine (*Pinus ponderosa*), mixed-conifer, white fir (*Abies concolor*), and mixed-evergreen forest types, with few occurring in the lower-elevation oak woodlands of the western foothills. California spotted owls use a variety of habitat types for nesting. At higher elevations, they primarily nest in conifers, while at lower elevations, they increasingly nest in hardwoods. High canopy cover is an important predictor for California spotted owl nest locations and a multilayered high canopy cover around the nest tree and in territories is an important factor associated with reproductive success (FWS 2022).

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 identify key habitats or designate specific lands or areas to protect for conservation of special-status wildlife species in the GAI. These conservation and land management plans are presented in Table 7-2.

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.

Table 7-2. Regional Conservation Plans Identifying Areas of Habitat Important for Species of Mitigation Need in the GAI

Document	Reference	Areas of Important Habitat
Conservation and Land Management Documents	<i>See below</i>	<i>See below</i>
<i>A Climate Change Vulnerability Assessment of California's Terrestrial Vegetation</i>	Thorne et al. 2016	Separates California ecosystems into 29 natural vegetation community types and analyzes the vulnerability of each ecosystem under different climate change models.
<i>California Essential Habitat Connectivity Project (CEHC)</i>	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 within this area.
<i>Restoring California's Wildlife Connectivity 2022: 2022 Priority Wildlife Connectivity Locations by Region</i>	CDFW 2022	In the GAI, identifies five highway segments (Highway 89 junction with Highway 88, Highway 4, State Route 108 – Donnell Vista, Highway 395, and Highway 41) as wildlife passage priorities for mule deer, mountain lion, black bear, and fisher.
<i>California State Wildlife Action Plan (SWAP)</i>	CDFW 2015a	The GAI overlaps one of the SWAP's defined geographic provinces, the Central Valley and Sierra Nevada Province. 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.
<i>Merced Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement</i>	NPS 2014a	Provides NPS' Management Plan for the 81 miles of the Merced Wild and Scenic River within Yosemite National Park and El Portal Administrative Site.
<i>Sierra Resource Management Plan and Record of Decision</i>	BLM 2021	Provides BLM's management plan for the public lands under the jurisdiction of the Folsom Field office. Lands within this jurisdiction overlap with the GAI.
<i>Tuolumne Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement</i>	NPS 2014b	Provides NPS' management plan for the wild and scenic portion of the Tuolumne River.

Document	Reference	Areas of Important Habitat
<i>Wildlife Connectivity Across the Northern Sierra Nevada Foothills</i>	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 as well as 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 the western portion of the GAI.
<i>Inyo National Forest Land Management Plan</i>	USFS 2019	Provides USFS' plan for managing lands within the Inyo National Forest, which includes areas in the southeastern portion of the GAI.
<i>Yosemite National Park General Management Plan</i>	NPS 1980	Provides NPS' management plan for visitor use, park operations, and development within Yosemite National Park. The GAI overlaps with the northern extent of the park, including Yosemite Valley, the main visitor use area.
City and County General Plans	<i>See below</i>	<i>See below</i>
<i>Alpine County General Plan</i>	Alpine County 2021	Provides a general plan for Alpine County. Requires mitigation for impacts on wetland habitat. Includes land use designations for wilderness, stream environments, and open space.
<i>Amador County General Plan</i>	Amador County 2016	Provides a general plan for Amador County. Includes multiple categories of open-space land use designations because the county is mostly rural and forested. Includes goals to protect and enhance wetlands, riparian corridors, and vernal pools.
<i>Angels Camp 2020 General Plan</i>	City of Angels Camp 2021	Provides a general plan for Angels Camp. Establishes an open-space setback of an indeterminate distance encompassing designated flood hazard areas along Angels and Six Mile Creeks. Includes a land use designation of open space. Includes a plan to draft a Creek Corridor Preservation and Management Plan for Angels Creek.
<i>Calaveras Big Trees State Park Preliminary General Plan</i>	California State Parks 1989	Provides California State Parks' management plan for Calaveras Big Trees State Park. Includes a goal to restore wetland meadows and remove campsites near the North Grove.
<i>Calaveras County General Plan</i>	Calaveras County 2020	Provides a general plan for Calaveras County. Includes goals to maintain diverse populations of plants, fish, and wildlife.
<i>Calaveras Country Club Specific Plan</i>	Sierra Engineering 1993	Specific plan for a planned community within Calaveras County. Includes measures to protect wetlands and water quality.

Document	Reference	Areas of Important Habitat
<i>Chicken Ranch Rancheria 2020 Wetland Program Plan</i>	Chicken Ranch Rancheria 2020	Provides Chicken Ranch Rancheria of Me-wuk Indians of California's programmatic plan for monitoring and protecting wetlands on Chicken Ranch Rancheria Reservation lands. Includes a general goal to restore wetland habitat.
<i>City of Sonora General Plan 2020</i>	City of Sonora 2017	Provides a general plan for Sonora. Requires streamside setbacks of 50 feet on both sides of Woods Creek, Sonora Creek, and Dragoon Gulch (as measured from the top of the bank of the creek or drainage channel). Includes a unified land use designation of park/recreation/resource/open space.
<i>Mono County General Plan</i>	Mono County 2021	Provides a general plan for Mono County. Includes land use designations of natural habitat protection, open space, and resource management. Includes a number of aquatic habitat goals.
<i>Stanislaus National Forest – Forest Plan Direction</i>	USFS 2017	Provides USFS' management plan for the Stanislaus National Forest. Includes a general goal to restore ecological function of streams, lakes, wetlands, and wet meadows.
<i>Sutter Creek General Plan</i>	City of Sutter Creek 2019	Provides a general plan for Sutter Creek. Includes a land use designation of open space and a Creekside Greenway overlay designed to limit development in riparian habitats.
<i>Mariposa County General Plan</i>	Mariposa County 2023	Provides a general plan for Mariposa County. Includes a land use designation of natural resources that limits development on lands designated for open space, recreation, ecosystem conservation, watershed and environmental protection, and conservation of natural resources. Includes a number of conservation and open space goals that target endangered species.
<i>Tuolumne County General Plan</i>	Tuolumne County 2018	Provides a general plan for Tuolumne County, which includes a general goal to enhance Sullivan Creek, Elsey's Pool, Curtis Creek, and Sonora Creek. Includes land use designations of open space as well as parks and recreation. A 200-foot building setback is required from the thread of Sullivan, Flores, and Curtis Creeks.
Water Resources Plans and Documents	<i>See below</i>	<i>See below</i>
<i>Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update</i>	Upper Mokelumne River Watershed Authority 2022	Provides Upper Mokelumne River Watershed Authority's plan for the management of water resources in Amador and Calaveras Counties and portions of Alpine and Tuolumne Counties. Includes a general goal to enhance and restore riparian systems in the plan area, and prioritizes those in the Calaveras and Mokelumne River watersheds.

Document	Reference	Areas of Important Habitat
<i>Tahoe-Sierra Integrated Regional Water Management Plan</i>	Tahoe Sierra Regional Water Management Group 2007	Provides Tahoe Sierra Regional Water Management Group's plan for the management of water resources in the plan area, which includes the northernmost portion of the GAI. Includes general goals to improve water quality and restore degraded streams and wetlands.
<i>Tuolumne-Stanislaus Integrated Regional Water Management Plan</i>	Tuolumne-Stanislaus Integrated Regional Water Management Authority 2017	Provides Regional Water Management Group's plan for the management of water resources in the plan area, which primarily consists of Tuolumne County along with small portions of Alpine and Calaveras Counties. Includes general objectives to reduce contamination in waterways and restore wetlands, springs, fens, vernal pools, and riparian habitats.
<i>Yosemite-Mariposa Integrated Regional Water Management Plan</i>	Mariposa County Resource Conservation District 2016	Provides Mariposa County Resource Conservation District's plan for the management of water resources in Mariposa County. Includes a goal to restore 10,000 acres of habitat for special-status species by 2035.
Special-status Taxa Documents	<i>See below</i>	<i>See below</i>
<i>Recovery Plan for the California Red-legged Frog (Rana aurora draytonii)</i>	FWS 2002	Identifies California red-legged frog Recovery Units and their respective Core Areas, including those in the GAI, which include: ▪ Sierra Nevada Foothills and Central Valley Recovery Unit – Cosumnes River Core Area – South Fork Calaveras River Core Area – Tuolumne River Core Area – Piney Creek Core Area
<i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i>	FWS 2005	Provides FWS' recovery plan for vernal pool species in California and Oregon, which includes 25 plants, 7 invertebrates, and 1 amphibian, for a total of 33 species. Sixteen regions are identified in this plan, along with 41 core areas. The Southeastern Sacramento Valley and Southern Sierra Foothills Vernal Pool Regions overlap the GAI.
<i>Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (Ambystoma californiense)</i>	FWS 2017b	Identifies California tiger salamander Recovery Units and their respective Management Units, including those in the GAI: ▪ Central Valley Recovery Unit – Oakdale/Waterford Recovery Unit – Hickman/Snelling Recovery Unit

Document	Reference	Areas of Important Habitat
<i>Species Status Assessment Report for the Foothill Yellow-Legged Frog (Rana boylei)</i>	FWS 2023d	Provides an assessment of the foothill yellow-legged frog performed prior to species listing under the FESA. Describes the species' needs as well as future viability of the species as a whole.
<i>A Status Review of the Foothill Yellow-Legged Frog (Rana boylei) in California</i>	CDFW 2019b	Provides CDFW's status review of the foothill yellow-legged frog.
<i>Considerations for Conserving the Foothill Yellow-Legged Frog</i>	CDFW 2018c	Includes CDFW's document that outlines considerations when conserving foothill yellow-legged frog. It describes basic ecology of the foothill yellow-legged frog, as well as avoidance and minimization considerations for conservation.
<i>Interagency Conservation Strategy for Mountain Yellow-Legged Frogs in the Sierra Nevada (Rana sierrae and Rana muscosa)</i>	CDFW 2018d	Provides an interagency developed document to serve as technical guidance for restoration activities aimed at conservation of Sierra Nevada yellow-legged frog and the northern DPS of the mountain yellow-legged frog populations throughout California. The conservation actions listed in the strategy will inform a future recovery plan. Three clades of Sierra Nevada yellow-legged frog are identified in this strategy. The GAI covers the northern border of Clade 2 and the southern extent of Clade 3.
<i>Endangered and Threatened Wildlife and Plants; Foothill Yellow-Legged Frog; Threatened Status with Section 4(d) Rule for Two Distinct Population Segments and Endangered Status for Two Distinct Population Segments</i>	FWS 2023a	Provides the federal listing document for foothill yellow-legged frog. Describes the life history of the species and the rationale behind designating the species under the FESA. Provides information about stressors to the species.
<i>Species Assessment Report for Western Spadefoot (Spea hammondi)</i>	FWS 2023b	Provides an assessment of the status of western spadefoot performed prior to species listing under the FESA. Describes the different DPS units and the stressors the species faces throughout its range.
<i>Species Status Assessment Report for the California Spotted Owl (Strix occidentalis occidentalis) Version 2.0</i>	FWS 2022	Provides an assessment of the status of California spotted owl performed prior to subspecies listing under the FESA. Describes the distribution of different populations of the subspecies, as well as its life history, habitat preferences, and threats to its viability.

7.5 Pressures and Stressors

Pressures and stressors refer to environmental trends or physical, chemical, or biological factors or conditions that affect special-status wildlife species in the GAI or their 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 *Recovery Plan for the California Red-legged Frog* (FWS 2002), the *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (FWS 2005), the *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander* (FWS 2017b), *Endangered and Threatened Wildlife and Plants; Foothill Yellow-Legged Frog; Threatened Status with Section 4(d) Rule for Two Distinct Population Segments and Endangered Status for Two Distinct Population Segments* (FWS 2023a), *Species Assessment Report for Western Spadefoot* (FWS 2023b), and *Species Status Assessment Report for the California Spotted Owl* (FWS 2022) 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 species in the GAI (FWS 2002, 2005, 2017b, 2022, 2023a, 2023b). 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 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 non-native species have led to the loss and degradation of existing habitat for sensitive wildlife species in the GAI. Additionally, roads and urbanization have resulted in habitat fragmentation and a decrease in connectivity between habitats that support populations of sensitive wildlife species in the GAI.

Roads and highways can hinder the movement of various wildlife species and are considered permanent physical barriers leading to increased habitat fragmentation and isolation of populations (CDFW 2022). Roads near aquatic habitats that are poorly constructed or inadequately maintained may lead to increased erosion, sedimentation, and petrochemical runoff, negatively affecting populations of wildlife species that depend on these habitats, including California red-legged frog, California tiger salamander, foothill yellow-legged frog, and western spadefoot (FWS 2002, 2017b, 2023a, 2023b). 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). Roadway noise has been shown to disrupt amphibian communication by

altering call rates, frequency, and duration. The stress caused by long-term exposure to high noise levels can interfere with amphibian mating success and may elevate stress hormone levels (Jiang et al. 2023).

Alteration of flow regimes for anthropogenic activities such as hydropower, agriculture, and mining can degrade suitable habitat for amphibians such as California red-legged frog, foothill yellow-legged frog, and Sierra Nevada yellow-legged frog. These activities can also increase sedimentation, which can impact the ability of amphibians to deposit eggs to suitable substrates. Loss of vernal pool habitat throughout the state has led to a loss in suitable breeding habitats for California tiger salamander and western spadefoot.

Various forest management practices over the past century, including clearcutting, mechanical thinning, salvage logging, and prescribed fire have had various effects, both positive and negative, on California spotted owl. Clearcutting practices in particular, which were still common through the late twentieth century, decimated much of the multi-layered high-canopy cover habitat preferred by California spotted owls. Mid-elevation development, including expansion of roadways, has exacerbated this fragmentation and degradation of their habitat, and rendered them more susceptible to competition, hybridization, and predation by the expanding barred owl (*Strix varia*), which thrives in the more open woodland habitats created by this landscape alteration (FWS 2022).

7.5.2. Invasive Species

Transportation projects and associated ongoing maintenance activities have the potential to introduce and/or spread non-native, invasive species. The entry of invasive, non-native species into an ecosystem may reduce biodiversity, degrade habitats, alter native genetic diversity, shift habitat types, and further threaten already endangered or threatened natural resources. Invasive plant species can facilitate habitat loss or alteration by limiting the quantity or quality of food resources for native species (Hayes et al. 2016). In addition to plants, introduced and non-native wildlife can also have negative impacts on native species. Introduced crustacean and amphibian species, such as red swamp crayfish and American bullfrog, are known to negatively impact native amphibian species that depend on aquatic resources (Jennings and Hayes 1994; Kupferberg 1997). Introduction of mosquitofish (*Gambusia affinis*) to wetlands has been known to result in the loss of developing California tiger salamander embryos and larvae due to predation (FWS 2017b). Fish stocking of alpine lakes has also proven to be detrimental to Sierra Nevada yellow-legged frog populations in the high Sierras (*Federal Register* 2014). The range expansion of barred owl from the eastern and northern U.S. and Canada south into the Sierra Nevada has impacted California spotted owl greatly because barred owls thrive in a greater diversity of habitat types and will often outcompete, predate upon, or hybridize with California spotted owls (FWS 2022).

7.5.3. 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 for 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 and more frequent heat waves during 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 2019b).

Climate variability has been shown to affect the survival and reproductive success of California spotted owl. Drought conditions and hot temperatures during summer have been found to reduce the fecundity of California spotted owls during the following breeding season. Increases in precipitation either before or after the nesting season are linked to increased survival and fecundity, whereas increased precipitation during the nesting season reduces reproductive success. Changes in climate may also include potential shifts in forest communities upslope, which would affect both California spotted owl habitat and that of their prey. The loss and/or reduction of suitable habitat throughout their range will likely reduce the reproduction, occupancy, survival, recruitment, and population growth of California spotted owl (FWS 2022).

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 wildlife species to respond to climate change stress by preserving large blocks of habitat and linkage areas that will allow migration toward more suitable habitat as the climate changes, and by providing protection for the ecological processes that support key habitat. The terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a) is presented on Figure 2-5. Climate resilience is low in the Sierra Nevada foothills and 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. These effects could lead to a reduction in habitat suitability for special-status wildlife species in the GAI. For example, the extended periods of higher temperatures and increased fluctuations in precipitation suggested by climate change models may result in more variable and extreme flows in river systems that support special-status amphibian species.

7.5.4. Contaminants

Pesticides, herbicides, mineral fertilizers, industrial chemicals, and airborne pollutants are known to have negative effects on wildlife species that use aquatic habitats. Amphibians, such as California-red legged frog, are especially affected by aqueous pesticides because of the many life stages that take place within aquatic environments (FWS 2002). Amphibians spend a high percentage of their time in water, moving through the interface of water and air, and conducting a significant proportion of respiration through their skin, so they are at greater risk of exposure to pesticides that are readily absorbed through the skin, respiratory system, or gastrointestinal tract (Green et al. 2014). Heavy metals are known to bioaccumulate throughout trophic systems and have the potential to cause harm to predators such as spotted owls (FWS 2022).

Although there is little information specific to California spotted owl regarding the exposure rates and resulting impacts of rodenticides, available literature on other species suggests the potential for widespread exposure. Exposure of nontarget species to

anticoagulant rodenticides is commonly associated with agricultural or urban settings, but exposure in forest settings in northern California has recently been documented as detrimental to northern spotted and barred owls. Anticoagulant rodenticide use has increased throughout California with increases in illegal marijuana cultivation since anticoagulant rodenticides are used to control rodent damage to the plants (FWS 2022).

7.5.5. Disease

Ranaviruses are viruses known to infect amphibians, reptiles, and fishes. One such Ranavirus, known as ATV (*Ambystoma tigrinum virus*), has caused widespread tiger salamander die-offs throughout the country (Jancovich et al. 2005). The disease has not yet reached California; however, if it does, it could infect all amphibian species in the GAI. The chytrid fungus *Batrachochytrium dendrobatidis* has been documented in various locations throughout the state and has been shown to infect California tiger salamander, foothill yellow-legged frog, and Sierra Nevada yellow-legged frog populations (Adams et al. 2017; Briggs et al. 2005). There is a deficit of research to show whether the fungus may affect other amphibian species negatively. Disease has not been identified as a particularly concerning threat to California spotted owls at this time (FWS 2022).

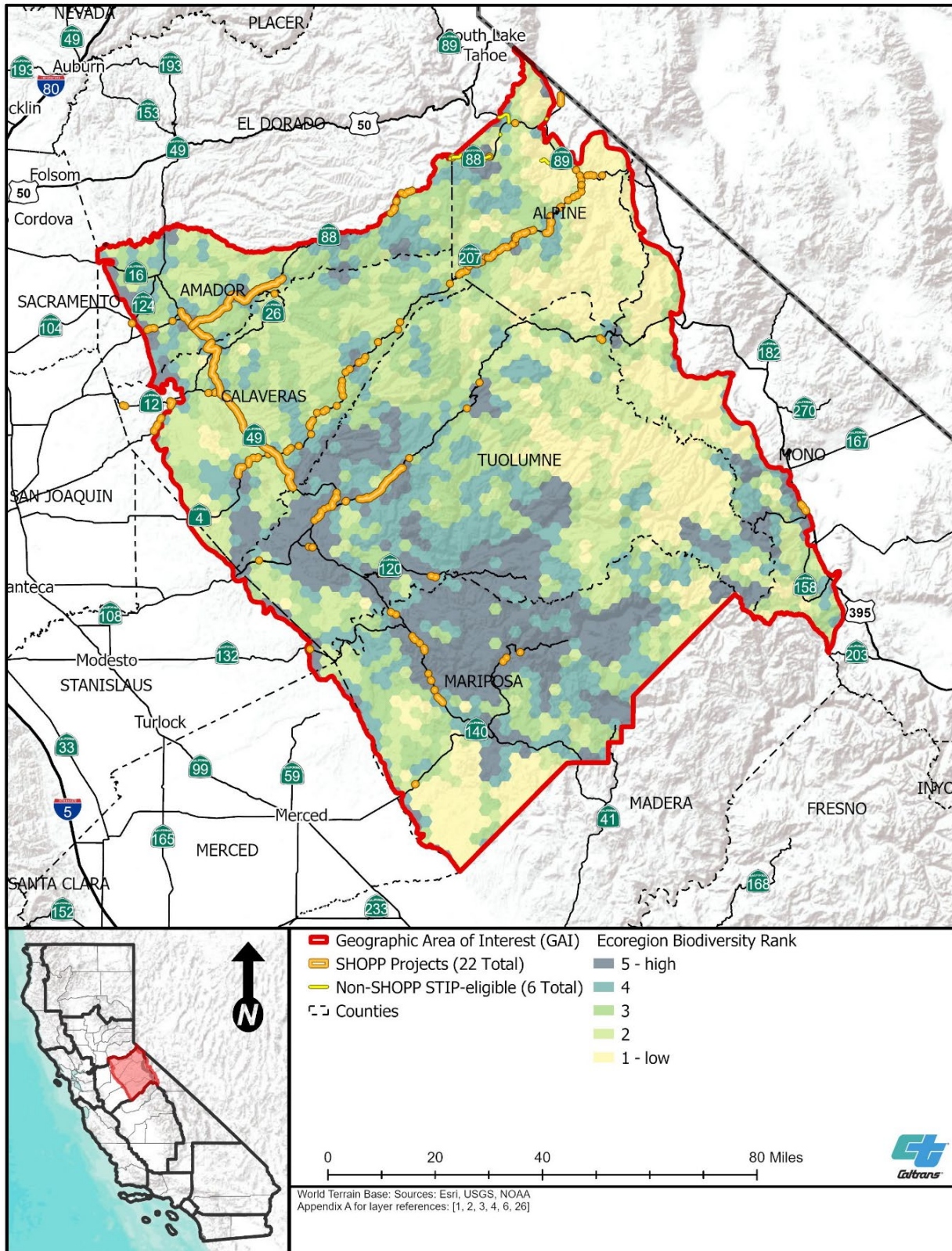
7.6 Multi-species Benefits

While the species of mitigation need identified for this GAI are California red-legged frog, California tiger salamander, foothill yellow-legged frog, Sierra Nevada yellow-legged frog, western spadefoot, and California spotted owl, several other special-status species and their habitats could potentially be affected by Caltrans transportation projects that will need compensatory mitigation to satisfy natural resource regulatory agency conditions on a transportation project (Appendix D, *Complete SAMNA Species Results*, Tables D-1 and D-2).

Advance mitigation planning provides Caltrans an opportunity to integrate the protection and preservation of multiple California native species, biodiversity, and ecosystems into project scoping. Figure 7-1 illustrates the regional terrestrial biodiversity in the GAI, according to CDFW's ACE GIS dataset. According to these data, high to moderate terrestrial biodiversity is present along much of the SHS, with SHOPP and STIP-eligible projects (such as along Highway 49, Highway 120, and Highway 140 in Mariposa and Tuolumne Counties), while other portions of the SHS in the GAI with SHOPP and STIP-eligible projects show low biodiversity (such as along Highway 4 in Alpine and Calaveras Counties). Habitats are mapped in Appendix C, *Land Cover Types*, and the special-status species that may occur in these habitats are provided in Appendix D.

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 2021). 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 potential to co-occur in species of mitigation need habitat 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 species of mitigation need, address pressures and stressors, and support species of mitigation need recovery and success in the GAI. Each conservation goal is supported by one or more conservation objectives and is meant to further guide District 10 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 or conservation benefit for species of mitigation need in the GAI. Sub-objectives also capture specific measures from conservation and land management plans that address threats to wildlife species of mitigation concern. 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.

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

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 in 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 in 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 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 habitat for species of mitigation need; lands adjacent to suitable habitat; and/or land that expands or buffers existing protected suitable habitats. Sub-Objective WILD-1.1.4: Prioritize land acquisition and/or protection that supports key populations. Sub-Objective WILD-1.1.5: Prioritize acquisition, protection, and/or enhancement of SWAP (CDFW 2015a) conservation targets: alpine vegetation, western upland grasslands, wet mountain meadow, California foothill and coastal rock outcrop vegetation, California foothill and valley forests and woodlands, and chaparral (Figure 7-2), 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.	▪ California red-legged frog ▪ California tiger salamander ▪ foothill yellow-legged frog ▪ Sierra Nevada yellow-legged frog ▪ western spadefoot ▪ California spotted owl	▪ SWAP (CDFW 2015a) and companion plans (CDFW 2016a, 2016b) ▪ CEHC (Spencer et al. 2010) ▪ <i>California Wildlife Barriers: 2020 Priority Wildlife Movement Barrier Locations by Region</i> (CDFW 2022) ▪ <i>Merced Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement</i> (NPS 2014a) ▪ <i>Tuolumne Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement</i> (NPS 2014b) ▪ <i>Calaveras Big Trees State Park Preliminary General Plan</i> (California State Parks 1989) ▪ <i>Chicken Ranch Rancheria 2020 Wetland Program Plan</i> (Chicken Ranch Rancheria 2020) ▪ <i>Stanislaus National Forest – Forest Plan Direction</i> (USFS 2017) ▪ <i>Mokelumne/Amador/Calaveras Integrated Water Resource Management Plan</i> (Upper Mokelumne River Watershed Authority 2022) ▪ <i>Tahoe-Sierra Integrated Water Resource Management Plan</i> (Tahoe Sierra Regional Water Management Group 2007) ▪ <i>Tuolumne-Stanislaus Integrated Water Resource Management Plan</i> (Tuolumne-Stanislaus Integrated Regional Water Management Authority 2017) ▪ <i>Sierra Resource Management Plan and Record of Decision</i> (BLM 2021) ▪ <i>Calaveras Country Club Specific Plan</i> (Sierra Engineering 1993) ▪ <i>Yosemite-Mariposa Integrated Water Resource Management Plan</i> (Mariposa County Resource Conservation District 2016) ▪ <i>Yosemite National Park General Management Plan</i> (NPS 1980) ▪ <i>Inyo National Forest Land Management Plan</i> (USFS 2019) ▪ <i>Angels Camp 2020 General Plan</i> (City of Angels Camp 2021) ▪ <i>City of Sonora General Plan 2020</i> (City of Sonora 2017) ▪ <i>Sutter Creek General Plan</i> (City of Sutter Creek 2019) ▪ <i>Amador County General Plan</i> (Amador County 2016) ▪ <i>Alpine County General Plan</i> (Alpine County 2021) ▪ <i>Calaveras County General Plan</i> (Calaveras County 2020) ▪ <i>Mono County General Plan</i> (Mono County 2015) ▪ <i>Mariposa County General Plan</i> (Mariposa County 2023) ▪ <i>Tuolumne County General Plan</i> (Tuolumne County 2018) ▪ <i>Recovery Plan for the California Red-legged Frog (Rana aurora draytonii)</i> (FWS 2002) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005) ▪ <i>Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (Ambystoma californiense)</i> (FWS 2017b) ▪ <i>Interagency Conservation Strategy for Mountain Yellow-legged Frogs in the Sierra Nevada</i> (CDFW 2018d) ▪ <i>Species Status Assessment Report for the California Spotted Owl (Strix occidentalis occidentalis)</i> Version 2.0 (FWS 2022)

Objective	Sub-Objective	Affected Species ^a	Alignment with Conservation and Management Plans ^b
Goal WILD-2: Preserve, enhance, and increase connectivity between blocks of wildlife habitat to allow for dispersal that will maintain resilience and variability of wildlife populations.	<i>See below</i>	<i>See below</i>	<i>See below</i>
Objective WILD- 2.1: Acquire, protect, restore, and/or enhance movement corridors in the GAI in advance of transportation project impacts.	Sub-Objective WILD-2.1.1: Identify movement corridors for wildlife species of mitigation need in the GAI and acquire, protect, restore, and/or enhance corridors such that the greatest functional lift for wildlife species of mitigation need is provided. Sub-Objective WILD-2.1.2: Prioritize habitat in key linkage areas, between habitat areas, and/or in areas that provide a buffer to key or existing corridors. Sub-Objective WILD-2.1.3: Identify areas that will enhance connectivity between existing protected breeding locations and create new breeding habitat for wildlife species of mitigation need.	▪ California red-legged frog ▪ California tiger salamander ▪ foothill yellow-legged frog ▪ Sierra Nevada yellow-legged frog ▪ western spadefoot	▪ <i>SWAP</i> (CDFW 2015a) and companion plans (CDFW 2016a, 2016b) ▪ <i>CEHC</i> (Spencer et al. 2010) ▪ <i>Restoring California’s Wildlife Connectivity 2022: 2022 Priority Wildlife Connectivity Locations by Region</i> (CDFW 2022) ▪ <i>Tuolumne Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement</i> (NPS 2014b) ▪ <i>Calaveras Big Trees State Park Preliminary General Plan</i> (California State Parks 1989) ▪ <i>Chicken Ranch Rancheria 2020 Wetland Program Plan</i> (Chicken Ranch Rancheria 2020) ▪ <i>Stanislaus National Forest – Forest Plan Direction</i> (USFS 2017) ▪ <i>Mokelumne/Amador/Calaveras Integrated Water Resource Management Plan</i> (Upper Mokelumne River Watershed Authority 2022) ▪ <i>Tahoe-Sierra Integrated Water Resource Management Plan</i> (Tahoe Sierra Regional Water Management Group 2007) ▪ <i>Tuolumne-Stanislaus Integrated Water Resource Management Plan</i> (Tuolumne-Stanislaus Integrated Regional Water Management Authority 2017) ▪ <i>Sierra Resource Management Plan and Record of Decision</i> (BLM 2021) ▪ <i>Yosemite-Mariposa Integrated Water Resource Management Plan</i> (Mariposa County Resource Conservation District 2016) ▪ <i>Angels Camp 2020 General Plan</i> (City of Angels Camp 2021) ▪ <i>City of Sonora General Plan 2020</i> (City of Sonora 2017) ▪ <i>Sutter Creek General Plan</i> (City of Sutter Creek 2019) ▪ <i>Alpine County General Plan</i> (Alpine County 2021) ▪ <i>Amador County General Plan</i> (Amador County 2023) ▪ <i>Calaveras County General Plan</i> (Calaveras County 2020) ▪ <i>Mono County General Plan</i> (Mono County 2015) ▪ <i>Mariposa County General Plan</i> (Mariposa County 2023) ▪ <i>Tuolumne County General Plan</i> (Tuolumne County 2018) ▪ <i>Recovery Plan for the California Red-legged Frog</i> (<i>Rana aurora draytonii</i>) (FWS 2002) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005) ▪ <i>Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander</i> (<i>Ambystoma californiense</i>) (FWS 2017b)

Objective	Sub-Objective	Affected Species ^a	Alignment with Conservation and Management Plans ^b
Goal WILD-3: Support resiliency of the landscape to climate change.	<i>See below</i>	<i>See below</i>	<i>See below</i>
Objective WILD-3.1: Acquire, protect, restore, and/or enhance habitat that supports resilience to climate change in 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 wildlife 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 wildlife species of mitigation need.	- California red-legged frog - California tiger salamander - foothill yellow-legged frog - Sierra Nevada yellow-legged frog - western spadefoot - California spotted owl	- SWAP (CDFW 2015a) and companion plans (CDFW 2016a, 2016b) <i>A Climate Change Vulnerability Assessment of California’s Terrestrial Vegetation</i> (Thorne et al. 2016) - CEHC (Spencer et al. 2010) <i>Restoring California’s Wildlife Connectivity 2022: 2022 Priority Wildlife Connectivity Locations by Region</i> (CDFW 2022) <i>Merced Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement</i> (NPS 2014a) <i>Tuolumne Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement</i> (NPS 2014b) <i>Chicken Ranch Rancheria 2020 Wetland Program Plan</i> (Chicken Ranch Rancheria 2020) <i>Stanislaus National Forest – Forest Plan Direction</i> (USFS 2017) <i>Mokelumne/Amador/Calaveras Integrated Water Resource Management Plan</i> (Upper Mokelumne River Watershed Authority 2022) <i>Tuolumne-Stanislaus Integrated Water Resource Management Plan</i> (Tuolumne-Stanislaus Integrated Regional Water Management Authority 2017) <i>Inyo National Forest Land Management Plan</i> (USFS 2019) <i>Sierra Resource Management Plan and Record of Decision</i> (BLM 2021) <i>Yosemite-Mariposa Integrated Water Resource Management Plan</i> (Mariposa County Resource Conservation District 2016) <i>Angels Camp 2020 General Plan</i> (City of Angels Camp 2021) <i>City of Sonora General Plan 2020</i> (City of Sonora 2017) <i>Sutter Creek General Plan</i> (City of Sutter Creek 2019) <i>Alpine County General Plan</i> (Alpine County 2021) <i>Amador County General Plan</i> (Amador County 2016) <i>Calaveras County General Plan</i> (Calaveras County 2020) <i>Mono County General Plan</i> (Mono County 2015) <i>Tuolumne County General Plan</i> (Tuolumne County 2018) <i>Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander</i> (<i>Ambystoma californiense</i>) (FWS 2017b) <i>Mariposa County General Plan</i> (Mariposa County 2023) <i>Interagency Conservation Strategy for Mountain Yellow-Legged Frogs in the Sierra Nevada</i> (CDFW 2018d) <i>Species Status Assessment Report for the California Spotted Owl</i> (<i>Strix occidentalis occidentalis</i>) Version 2.0 (FWS 2022)

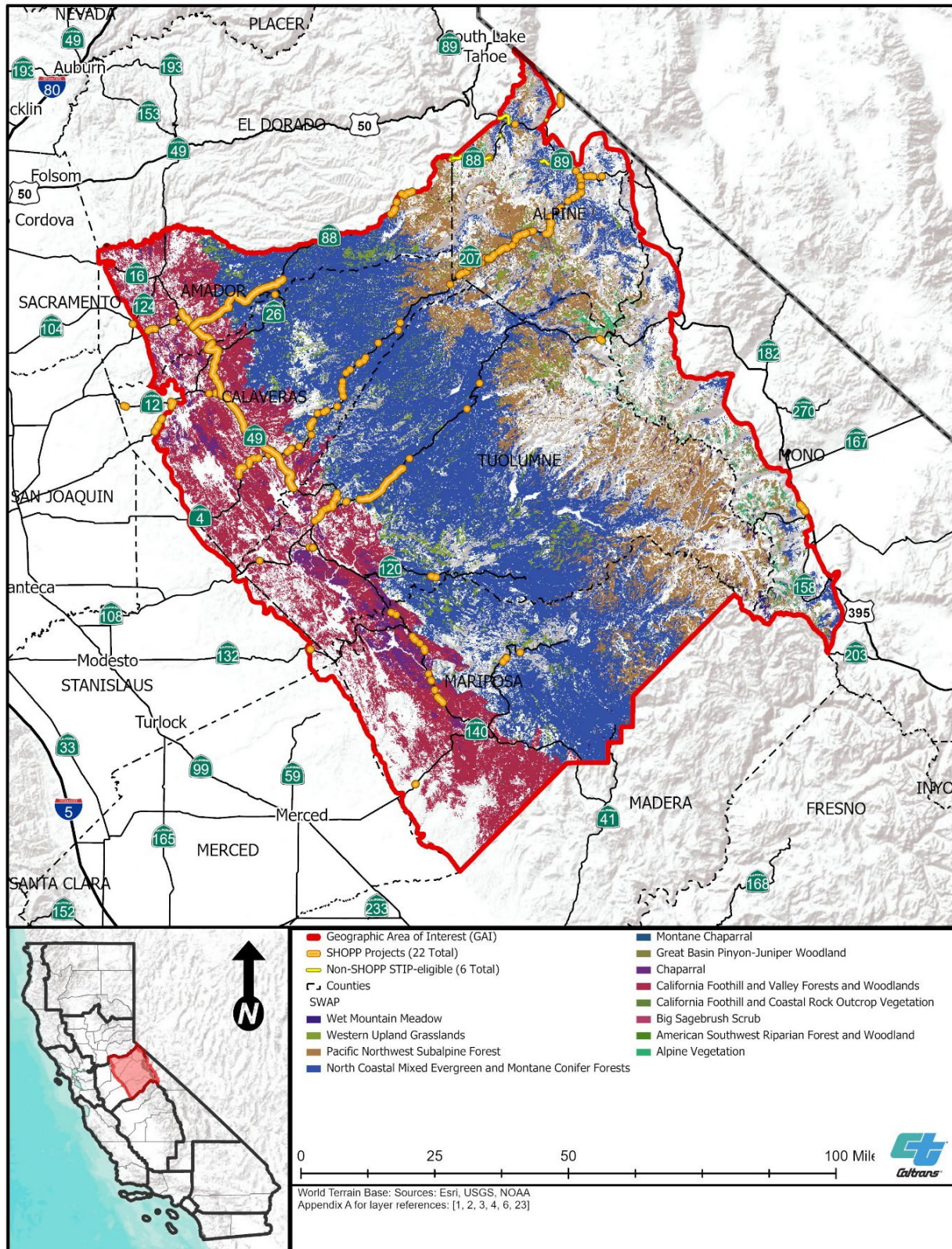
Objective	Sub-Objective	Affected Species ^a	Alignment with Conservation and Management Plans ^b
Goal WILD-4: Decrease mortality and competition, and protect population health for species of mitigation need.	<i>See below</i>	<i>See below</i>	<i>See below</i>
Objective WILD-4.1: Reduce impacts of invasive species on populations of species of mitigation need in 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 species of mitigation need. Prioritize areas where invasive species reduction would provide the greatest functional lift to species of mitigation need that utilize aquatic 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.	- California red-legged frog - California tiger salamander - foothill yellow-legged frog - Sierra Nevada yellow-legged frog - western spadefoot - California spotted owl	- SWAP (CDFW 2015a) and companion plans (CDFW 2016a, 2016b) - CEHC (Spencer et al. 2010) <i>Restoring California's Wildlife Connectivity 2022: 2022 Priority Wildlife Connectivity Locations by Region</i> (CDFW 2022) <i>Sierra Resource Management Plan and Record of Decision</i> (BLM 2021) <i>Recovery Plan for the California Red-legged Frog</i> (<i>Rana aurora draytonii</i>) (FWS 2002) <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005) <i>Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander</i> (<i>Ambystoma californiense</i>) (FWS 2017b) <i>Species Status Assessment Report for the California Spotted Owl</i> (<i>Strix occidentalis occidentalis</i>) Version 2.0 (FWS 2022)
Objective WILD-4.2: Reduce impacts from non-native predators in 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 red-legged frog - California tiger salamander - foothill yellow-legged frog - Sierra Nevada yellow-legged frog - western spadefoot	- SWAP (CDFW 2015a) and companion plans (CDFW 2016a, 2016b) - CEHC (Spencer et al. 2010) <i>Restoring California's Wildlife Connectivity 2022: 2022 Priority Wildlife Connectivity Locations by Region</i> (CDFW 2022) <i>Sierra Resource Management Plan and Record of Decision</i> (BLM 2021) <i>Recovery Plan for the California Red-legged Frog</i> (<i>Rana aurora draytonii</i>) (FWS 2002) <i>Interagency Conservation Strategy for Mountain Yellow-Legged Frogs in the Sierra Nevada</i> (CDFW 2018d) <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005) <i>Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander</i> (<i>Ambystoma californiense</i>) (FWS 2017b)
Objective WILD-4.3: Reduce road-associated mortality in 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 wildlife species to such crossing areas.	- California red-legged frog - California tiger salamander - foothill yellow-legged frog - Sierra Nevada yellow-legged frog - western spadefoot	- SWAP (CDFW 2015a) and companion plans (CDFW 2016a, 2016b) - CEHC (Spencer et al. 2010) <i>Restoring California's Wildlife Connectivity 2022: 2022 Priority Wildlife Connectivity Locations by Region</i> (CDFW 2022) <i>Amador County General Plan</i> (Amador County 2016) <i>Calaveras County General Plan</i> (Calaveras County 2020) <i>Recovery Plan for the California Red-legged Frog</i> (<i>Rana aurora draytonii</i>) (FWS 2002) <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005) <i>Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander</i> (<i>Ambystoma californiense</i>) (FWS 2017b)

Objective	Sub-Objective	Affected Species ^a	Alignment with Conservation and Management Plans ^b
Goal WILD-5: Prioritize multi-species and multi-resource benefits.	<i>See below</i>	<i>See below</i>	<i>See below</i>
Objective WILD-5.1: Acquire, protect, restore, and/or enhance habitat that provides multi-species benefits in the GAI in advance of transportation project impacts.	Sub-Objective WILD-5.1.1: Prioritize mitigation to provide benefits to multiple special-status species that may occur in key areas that will provide functional lift to these species in the GAI. Sub-Objective WILD-5.1.2: Consider the needs of other co-occurring species when planning site-specific actions to restore or create aquatic breeding habitat for California red-legged frog and/or California tiger salamander.	- California red-legged frog - California tiger salamander - foothill yellow-legged frog - Sierra Nevada yellow-legged frog - western spadefoot - California spotted owl	- SWAP (CDFW 2015a) and companion plans (CDFW 2016a, 2016b) - CEHC (Spencer et al. 2010) - Tuolumne Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement (NPS 2014b) - Calaveras Big Trees State Park Preliminary General Plan (California State Parks 1989) - Chicken Ranch Rancheria 2020 Wetland Program Plan (Chicken Ranch Rancheria 2020) - Stanislaus National Forest – Forest Plan Direction (USFS 2017) - Calaveras Country Club Specific Plan (Sierra Engineering 1993) - Mokelumne/Amador/Calaveras Integrated Water Resource Management Plan (Upper Mokelumne River Watershed Authority 2022) - Tahoe-Sierra Integrated Water Resource Management Plan (Tahoe Sierra Regional Water Management Group 2007) - Tuolumne-Stanislaus Integrated Water Resource Management Plan (Tuolumne-Stanislaus Integrated Regional Water Management Authority 2017) - Yosemite-Mariposa Integrated Water Resource Management Plan (Mariposa County Resource Conservation District 2016) - Angels Camp 2020 General Plan (City of Angels Camp 2021) - City of Sonora General Plan 2020 (City of Sonora 2017) - Sutter Creek General Plan (City of Sutter Creek 2019) - Alpine County General Plan (Alpine County 2021) - Mono County General Plan (Mono County 2015) - Sierra Resource Management Plan and Record of Decision (BLM 2021) - Tuolumne County General Plan (Tuolumne County 2018) - Recovery Plan for the California Red-legged Frog (<i>Rana aurora draytonii</i>) (FWS 2002) - Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon (FWS 2005) - Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander (<i>Ambystoma californiense</i>) (FWS 2017b) - Species Status Assessment Report for the California Spotted Owl (<i>Strix occidentalis occidentalis</i>) Version 2.0 (FWS 2022)

^a This column includes species of mitigation need that could benefit from these objectives.
^b More information on these plans is provided in Chapter 3, *Relevant Plans, Policies, and Regulations*.

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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 establish mitigation credits while addressing 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;
- 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 wildlife resources by creating functional lift or conservation benefit as well as mitigating the pressures and stressors on wildlife resources in the GAI. To summarize Table 7-3:

Goals WILD-1 and WILD-2 seek to conserve habitat for species of mitigation need in 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 species of mitigation need as well as a conservation benefit in terms of size, connectivity, quality, and contribution to the climate resilience of habitat in the GAI. These goals and objectives were selected to address habitat loss, fragmentation, and degradation as well as 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 climate resiliency in the GAI. The primary objectives are to reduce the effects of climate change on species of mitigation need by increasing the protection and functionality of land that is identified as crucial for climate resiliency, including corridors that provide the ability for these species to migrate from areas of low climate resilience into areas with higher resilience and addressing the climate change-related threat from invasive species. In addition to addressing climate change in general, these goals and objectives 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 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, predation, and contamination.

Goal WILD-5 seeks to guide advance mitigation scoping to prioritize multi-species and multi-resource benefits to maximize ecological benefits to the GAI. Goal WILD-5 was developed to include conservation for multiple species.

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 species of mitigation need and maximize conservation benefits from mitigation in 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, riparian habitat, 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; and
 - 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 areas of potential riparian function, 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 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, conservation and mitigation bank approvals, MCA and RCIS approvals, 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, 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, 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 Section 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 FESA. 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 FESA requires that the impact of any incidental take be minimized and mitigated to the maximum extent practicable. Section 7(a)(1) of the FESA 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. Conservation banking can assist federal and non-federal participants in the Section 7 and 10 processes. 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 Sections 7 and 10 of the FESA 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- and/or off-site. Purchasing credits in conservation banks is one method of protecting habitat on- or off-site.
NMFS	NMFS has jurisdiction over marine species listed as threatened or endangered under the FESA. Federal agencies must consult with NMFS to ensure that their actions do not jeopardize the continued existence of FESA-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 FESA 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.
SWRCB and RWQCB	The Porter-Cologne Act governs water quality regulation in California, and gives SWRCB and the RWQCBs the authority to condition projects, through waste discharge requirements, to protect water quality and the beneficial uses of waters of the state, as identified in Basin Plans. Basin Plans, adopted by the 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. SWRCB and the RWQCBs have been delegated the responsibility of implementing CWA Section 401, which regulates the discharge of pollutants into WOTUS. SWRCB and the RWQCBs 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 <i>State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State</i> (SWRCB, adopted 2019). Projects that occur in one region are regulated by that regional board, whereas projects that cross regions are regulated by SWRCB.

Note: EFH = Essential Fish Habitat

8.3 Aquatic Resources

An overview of aquatic resources is provided in Chapter 2, *Environmental Setting*, and summarized below. The GAI overlaps, in part or whole, with the HUC-8 boundaries listed in Table 8-2 as well as the following HUC-8 boundaries not included in Table 8-2: Crowley Lake, Fresno River, Lake Tahoe, Middle San Joaquin-Lower Chowchilla, Rock Creek-French Camp Slough, Upper Cosumnes, and Upper San Joaquin.

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

HUC-8	Named Aquatic Features
East Walker – HUC-8 16050301	▪ Robinson Creek
Mono Lake – HUC-8 18090101	▪ June Lake ▪ Mill Creek
South Fork American – HUC-8 18020129	▪ Caples Creek
Upper Calaveras – HUC-8 18040011	▪ Calaveras River ▪ South Fork Calaveras
Upper Carson – HUC-8 16050201	▪ Jeff Davis Creek ▪ Silver King Creek ▪ Silver Creek ▪ Wolf Creek
Upper Merced – HUC-8 18040008	▪ Merced River ▪ Piney Creek
Upper Mokelumne – HUC-8 18040012	▪ Antelope Creek ▪ Blue Creek ▪ Mokelumne River
Upper Stanislaus – HUC-8 18040010	▪ Deer Creek ▪ Dry Creek ▪ Stanislaus River
Upper Tuolumne – HUC-8 18040009	▪ Dragoon Gulch ▪ Sonora Creek ▪ Tuolumne River ▪ Woods Creek
West Walker – HUC-8 16050302	▪ Slinkard Creek ▪ West Walker River

8.3.1. Wetlands and Non-wetland Waters

In the GAI, the Merced, Stanislaus, and Tuolumne Rivers are the major stream systems in the Central Valley region portion of the GAI (Central Valley RWQCB 2019). The Walker River is a major stream system in the Lahontan Region portion of the GAI (Lahontan RWQCB 2021). 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 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 154,674 acres of aquatic habitat, consisting of 35 wetland and non-wetland waters habitats listed in Table 2-5 (Caltrans 2023g, 2023h). Ten 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. Areas of Potential Riparian Function

Forecast transportation project impacts on areas of potential riparian function, as discussed in Chapter 5, *Modeled Estimated Impacts*, were obtained by using the Caltrans riparian landcover dataset (described in Section 1.4.1).

8.3.3. Threatened and Endangered Fish Species of Mitigation Need

Special-status fish species were identified in Section 2.15.2. In brief, all special-status fish species with SAMNA results, provided in Section 5.3.1, and expected to be present in the GAI were identified as species of mitigation need for this RAMNA.

Steelhead

The Central Valley DPS of steelhead is a federally threatened species (Section 2.15.2). Designated critical habitat for this species does occur in the GAI (Section 2.8). The Central Valley DPS includes all naturally spawned anadromous steelhead originating below natural and human-made impassible barriers from the Sacramento and San Joaquin River and their tributaries, excluding such fish originating from San Francisco and San Pablo Bays and their tributaries. This DPS also includes the Coleman National Fish Hatchery Program, Feather River Fish Hatchery Program, and Mokelumne River Hatchery Program, none of which occur within the GAI [71 *Federal Register* 833].

Steelhead in this DPS exhibit anadromy and freshwater residency with approximately three quarters of fish being freshwater residents. Anadromous steelhead enter the freshwater systems of the Central Valley from August to April and spawn generally between December and April in small streams with cool, well-oxygenated water available year-round. In the Sacramento River, juvenile steelhead generally migrate to the ocean between spring and early summer, with peak migration between March and April. Adults spawn in coarse gravel in the tail of a pool or riffle. Juvenile steelhead are found in cool, clear, fast-flowing permanent streams (NMFS 2014).

Lahontan Cutthroat Trout

The Lahontan cutthroat trout is a federally threatened species (Section 2.15.2). Designated critical habitat for this species does not occur in the GAI (Section 2.8). Three populations of Lahontan cutthroat trout exist; however, these are not formally DPSs, although they can be delisted separately. These populations include the Western

Lahontan basin consisting of the Truckee, Carson, and Walker River basins; Northwestern Lahontan basin consisting of the Quinn River, Black Rock Desert, and Coyote Lake basins; and Humboldt River basin, of which the Carson and Walker River basins occur in the GAI.

Lahontan cutthroat trout are not anadromous; inhabit lakes and streams; and require habitat with cool water, pools near cover and velocity breaks, well-vegetated and stable stream banks, and relatively silt-free rocky substrate in riffle-run areas (FWS 1995).

Paiute Cutthroat Trout

The Paiute cutthroat trout is a federally threatened species (Section 2.15.2). Designated critical habitat for this species does not occur in the GAI (Section 2.8). Paiute cutthroat trout are not anadromous; occur entirely in Silver King Creek; and require cool, well-oxygenated waters. Adult fish prefer stream pool habitat in low-gradient meadows with undercut or overhanging banks and abundant riparian vegetation. Paiute cutthroat trout can survive in lakes, but there is no evidence that they ever occurred naturally in any of the lakes within the Silver King basin. To spawn successfully, they must have access to flowing waters with clean gravel substrates.

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 that are relevant to 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 8-3. 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
<i>2008 Final Compensatory Mitigation Rule</i>	73 <i>Federal Register</i> 19593	Provides 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, 33 Section 332.3).
<i>303(d) List of Impaired Water Bodies</i>	SWRCB 2021	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 (see Appendix F, <i>List of 303(d) Impaired Waters</i>), 48 waterbodies are listed as impaired in the GAI. Of these 48, none have an established TMDL.
<i>California Wetlands Conservation Policy</i>	Executive Order W-59-93	Provides the "No Net Loss Policy" for wetlands, which 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."
<i>National Wetlands Mitigation Action Plan</i>	EPA and Corps 2002	Provides EPA and Corps' comprehensive, interagency document to further achievement of the goal of no net loss of wetlands. The goals and objectives of the <i>National Wetlands Mitigation Action Plan</i> were incorporated into the <i>2008 Final Compensatory Mitigation Rule</i> , which was updated in 2015 and includes the no net loss policy.
<i>Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division</i>	Corps 2015	Provides guidelines for compensatory mitigation site selection. A watershed approach should be used when selecting sites to establish compensatory mitigation.
<i>State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State</i>	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
<i>Water Quality Control Plan for the Central Valley Region</i>	Central Valley RWQCB 2019	Identifies water quality objectives and beneficial uses for the Sacramento River and San Joaquin regions.
<i>Water Quality Control Plan for the Lahontan Region</i>	Lahontan RWQCB 2021	Identifies water quality objectives and beneficial uses for the North Lahontan and South Lahontan regions.
Special-Status Species and Sensitive Habitat Documents	See below	See below
<i>Lahontan Cutthroat Trout (Oncorhynchus clarkii henshawi) Recovery Plan</i>	FWS 1995	Includes general goals for fisheries management to manage the physical and biological functions of watershed areas such as uplands, floodplains, riparian zones, and channels and to manage trout populations in the Stanislaus, Mokelumne, and San Joaquin River systems.
<i>Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the DPS of California Central Valley Steelhead</i>	NMFS 2014	Includes the following goals: ▪ Restore instream flows and connectivity of the migration corridor during upstream and downstream migration periods, and create and restore side channel habitats in Antelope Creek. ▪ Enhance watershed resiliency in Mill, Deer, and Dry Creeks. ▪ Improve instream refuge cover in Dry Creek to minimize predatory opportunities for striped bass and non-native predators. ▪ Restore riparian habitat to promote shading and habitat diversity in the Tuolumne River.
<i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i>	FWS 2005	Identifies regions in the GAI covered by the plan, which are the Southeastern Sacramento Valley region, which does not have core areas in the GAI, and the Southern Sierra Foothills region containing the Farmington, Merced, and Shotgun Creek core areas. Listed species for recovery that use aquatic habitat in these core areas include vernal pool fairy shrimp, vernal pool tadpole shrimp, Hoover's spurge, Colusa grass, Green's tuctoria, hairy Orcutt grass, and fleshy owl's-clover. Non-listed species that are also expected to benefit from this plan include western spadefoot toad, California fairy shrimp (<i>Linderiella occidentalis</i>), and spiny sepaled button-celery (<i>Eryngium spinosepalum</i>).
<i>Revised Recovery Plan for the Paiute Cutthroat Trout (Oncorhynchus clarkii seleniris)</i>	FWS 2004	Includes a goal to restore riparian habitat and stream channels in the Silver King Creek Drainage and identifies the Silver Creek and Wolf Creek channels as important areas for the species condition.

Document	Reference	Information Identified
<i>Steelhead Restoration and Management Plan for California</i>	California Department of Fish and Game 1996	Includes stream-specific recommendations pertaining to the Mokelumne, Tuolumne, and Stanislaus Rivers.
Conservation and Land Management Documents	See below	See below
<i>Bishop Resource Management Plan Record of Decision</i>	BLM 1993	Includes a general goal to restore riparian habitat in streams in the plan area. In the GAI, the plan identifies Mill and Slinkard Creeks as priorities for meadow restoration and restoration activities for the benefit of Lahontan cutthroat trout.
<i>Calaveras Big Trees State Park Preliminary General Plan</i>	California State Parks 1989	Includes a goal to restore wetland meadows near North Grove, which occurs in the Upper Calaveras California HUC-8.
<i>Central Valley Flood Protection Plan 2022 Update</i>	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.
<i>Chicken Ranch Rancheria 2020 Wetland Program Plan</i>	Chicken Ranch Rancheria 2020	Includes a goal to restore wetland habitat on the Rancheria, which occurs in the Upper Tuolumne HUC-8.
<i>City of Sonora General Plan</i>	City of Sonora 2017	Identifies Woods Creek, Sonora Creek, and Dragoon Gulch as conservation priorities.
<i>Ecological Restoration Implementation Plan</i>	USFS 2013	Includes goals for the Inyo National Forest to stabilize and reduce erosion and sedimentation in streams and improve water quality. The part of the document covering the El Dorado National Forest identifies Caples Creek as a priority watershed and meadow habitat as a priority for restoration. The part of the document covering the Stanislaus National Forest identifies Blue Creek as a target for 20 miles of improvements to reduce sedimentation and stabilize soils.

Document	Reference	Information Identified
<i>Integrated Regional Water Management Plan: Cosumnes American Bear Yuba Watersheds, California</i>	California Department of Water Resources 2021	Identifies that this plan's coverage in the GAI includes the South Fork American HUC-8. For the entire plan area, this document includes the following specific goals: ▪ Restore the natural sediment regime in at least three river reaches. ▪ Enhance and/or restore at least 4 miles of streams. ▪ Remove trout and bullfrogs in 18 acres of high mountain lakes where foothill yellow-legged frogs can recolonize. ▪ Create 1 acre of pond habitat by 2025 where existing California red-legged frogs reside downstream and can colonize new habitat. ▪ Enhance at least 50 acres of riparian habitat by removing non-native plant species.
<i>Lake Tahoe Basin Management Unit Land Management Plan</i>	USFS 2016	Includes general goals to restore ecological function of aquatic habitats in the management unit, which occurs in the Upper Carson HUC-8, and includes a specific goal to restore at least 25 acres of aspen stands per year, some of which could occur in riparian habitat.
<i>Land Management Plan for the Inyo National Forest</i>	USFS 2019	Includes a goal to restore 400 acres of riparian areas by 2034.
<i>Land Management Plan for the Sierra National Forest Pre-objection Version</i>	USFS 2022	Includes the following specific goals to be implemented within 15 years of plan approval that apply to watersheds in the GAI: ▪ 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.
<i>Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update</i>	Upper Mokelumne River Watershed Authority 2022	Includes a general goal to enhance and restore riparian systems in the plan area, and prioritizes those in the Calaveras and Mokelumne River watersheds.
<i>Mono County General Plan</i>	Mono County 2021	Includes a general goal to restore riparian woodlands, wetlands, and riparian habitat. Includes specific goals to restore Robinson Creek and enhance habitat in and around June Lake for the benefit of fish.

Document	Reference	Information Identified
<i>Record of Decision. Reinitiation of Consultation on the Coordinated Long-Term Modified Operations of the Central Valley Project and State Water Project</i>	U.S. Bureau of Reclamation 2020	Includes a goal to conduct restoration along several locations on the Stanislaus River, including: ▪ River Mile 58 ▪ Goodwin Canyon (at the cable crossing and float tube pool) ▪ Honolulu Bar ▪ Buttonbush ▪ Rodden Road ▪ Two Mile Bar ▪ Kerr Park
<i>Stanislaus National Forest – Forest Plan Direction</i>	USFS 2017	Includes a general goal to restore the ecological function of streams, lakes, wetlands, and wet meadows in the forest.
<i>SWAP</i>	CDFW 2015a	Identifies wet mountain meadow as well as the California Foothill and Valley Forests and Woodlands (which can have riparian constituents) as conservation targets.
<i>Tahoe-Sierra Integrated Regional Water Management Plan</i>	Tahoe Sierra Regional Water Management Group 2007	Includes general goals to improve water quality as well as restore degraded streams and wetlands in the plan area, which is in the Upper Carson HUC-8 portion of the GAI.
<i>Tuolumne County General Plan</i>	Tuolumne County 2018	Includes a general goal to restore riparian habitat.
<i>Tuolumne-Stanislaus Integrated Regional Water Management Plan</i>	Regional Water Management Group 2017	Includes general objectives to reduce contamination in waterways and restore wetlands, springs, fens, vernal pools, and riparian habitats. Includes specific goals to remove Himalayan blackberry from five sites in the plan area, which includes the Rock Creek-French Camp Slough, Upper Stanislaus, and Upper Tuolumne HUC-8s, and to restore 20 acres of springs and/or riparian habitat.
<i>Washoe Tribe of Nevada and California Integrated Resource Management Plan</i>	Washoe Tribe of Nevada and California 2008	Includes a goal to eradicate tamarisk from riparian woodlands on tribal land, which occurs in the Upper Carson HUC-8.

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 directly² 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 or STIP and could benefit from in-kind mitigation purchased or established through an advance mitigation project.

8.5.1. Habitat Loss, Fragmentation, and Degradation

Urbanization and other anthropogenic factors such as roads, poor grazing practices, and habitat invasion by non-native species have led to the loss and degradation of aquatic resources. Additionally, the expansion of roads and urbanization have resulted in habitat fragmentation as well as 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 State Routes 4, 49, and 108 (Figure 2-6).

Habitat loss, fragmentation, and degradation have been described as factors in the decline of steelhead and the primary factors in the decline of both cutthroat trout species. These species depend on a mix of stream habitats, including woodland-dominated inland streams in the GAI. Human-induced threats from road building and construction have altered the connections between the types of habitat and amount of sediment supply into streams and rivers. Increased sedimentation also has direct negative effects on Central Valley steelhead and Paiute cutthroat trout by interfering with their physiological and biological processes, and indirect effects through degradation of their habitat (FWS 2020; NMFS 2014, 2016).

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

8.5.2. Invasive Species

Transportation projects and associated ongoing maintenance activities have the potential to introduce and/or spread non-native, invasive species. When non-native, 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 (*Polypogon monspeliensis*), which negatively impact native aquatic species (CDFW 2015a). Invasive plant species that affect riparian systems in the GAI include tree of heaven, giant reed, perennial pepperweed, black locust (*Robinia pseudoacacia*), Himalayan blackberry, and pampas grass (*Cortaderia selloana*) (Cal-IPC 2023).

Invasive animal species that can damage aquatic ecosystems in the GAI include historic stocked populations of rainbow, brook, and brown trout in aquatic systems that did not contain them. These species prey on native species; 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 non-native sunfish, which threatens native minnow and amphibian populations (CDFW 2015a).

Invasive species in general are considered a threat to native ecosystems and could directly or indirectly affect species of mitigation need (CDFW 2015a). Predation by crayfish (order Decapoda), American bullfrogs, and high densities of non-native fish such as striped bass (*Morone saxatilis*), small-mouthed bass (*Micropterus dolomieu*), and large-mouth bass (*Micropterus salmoides*) is known to be a problem for native fish species in general, although the extent of the problems contributing to the decline of steelhead is unknown (NMFS 2016). Non-native trout is listed as a primary threat to Lahontan cutthroat trout (FWS 2023c), and non-native salmonids generally are considered the greatest threat to Paiute cutthroat trout through hybridization restricting ranges, with brook, brown, and rainbow trout being the most threatening (FWS 2020). Additionally, introduction of the mosquito fish (*Gambusia affinis*) to wetlands can eliminate entire cohort of developing CTS embryos or larvae (FWS 2005).

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 as well as 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 2005).

These stressors affect steelhead by reducing survival rates for juveniles and reproductive rates for adults. Flow reductions through water use also increase the likelihood for fish stranding and contaminant concentration, and can cause tissue damage to steelhead. One of the most widespread stressors for all fish species of mitigation need is increased water temperature, which regulates feeding, spawning, growth, and migration. Agricultural runoff and sedimentation can shift dissolved oxygen, pH, and ammonia to levels that are dangerous for steelhead (NMFS 2014).

In many river systems, the creation of dikes, levees, tide gates, and culverts has affected water quality, geomorphology, and hydrology directly and/or indirectly. Removing or altering hydrologic connections can negatively affect the ability of steelhead to migrate to and from their natal streams. This, in turn, reduces overall reproductive success through a reduction in egg development, increased risk of mortality before spawning, and direct loss of spawning habitat (NMFS 2014). Although not specifically listed as a primary threat to either cutthroat trout species, increases in water temperature are listed as a threat for Paiute cutthroat trout, and these stressors often parallel habitat loss and fragmentation, which could amplify effects to both cutthroat trout species (FWS 2020).

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. During the next 30 years, the climate is expected to change, including 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 2019b). 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).

Steelhead has been identified as having a critical level of concern with respect to its vulnerability to climate change (Grantham 2018). Increased temperature is detrimental to the survival of most life stages of steelhead and would most likely affect summer-rearing juveniles (NMFS 2014, 2016). A recent study found that steelhead in California were most at risk from instream flooding, sea surface temperature changes, and ocean acidification (Crozier et al. 2019). Primary threats to both cutthroat trout species caused by climate change include decreased streamflow, increasing severity and frequency of drought, and shifts in the hydrograph (FWS 2020).

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). The exacerbation of these stressors by fire may affect all fish species of mitigation need, particularly Paiute cutthroat trout, which has had wildfires destroy habitat across multiple creeks of occupied habitat (FWS 2020).

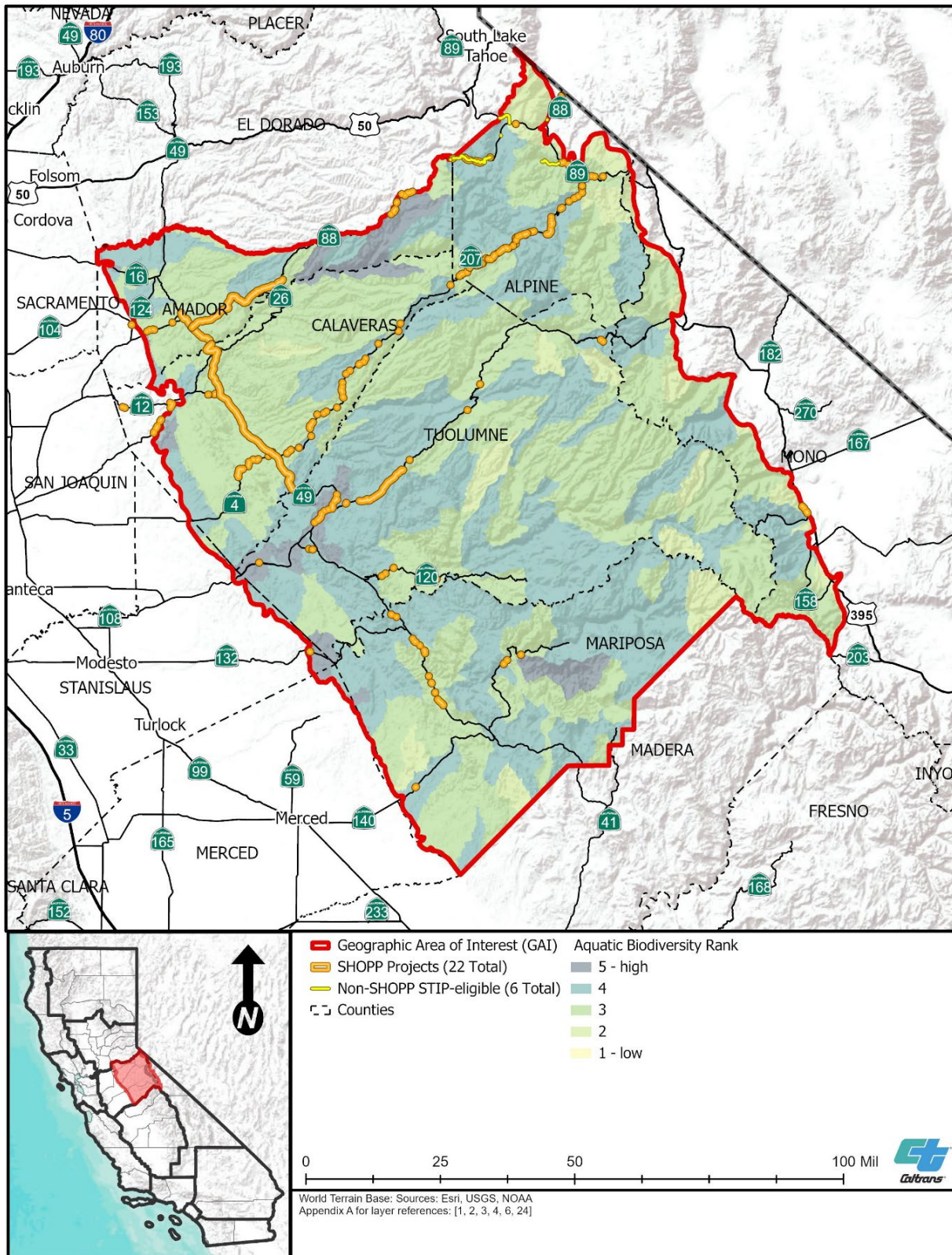
8.6 Multi-resource Benefits

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 to high aquatic biodiversity dominates the GAI in a scattered pattern. These areas are located along the SHS, with planned SHOPP and STIP-eligible 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*), Lahontan cutthroat trout, and mountain sucker (*Catostomus platyrhynchus*) as well as other species that use aquatic habitat, such as southern long-toed salamander (*Ambystoma macrodactylum*), western spadefoot toad, and western pearlshell mussel (*Margaritifera falcata*).
- 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 and STIP-eligible 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 resource 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 herein are intended to support the watershed approach, as practiced by natural resource regulatory agencies. The watershed approach is an analytical process through which the Corps, 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). 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.

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 and riparian habitat.	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 Merced, Stanislaus, and Tuolumne Rivers; as well as Calaveras River, Jeff Davis Creek, Mill Creek, Mokelumne River, Sonora Creek, Silver King Creek, and Woods 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.	▪ <i>2008 Final Compensatory Mitigation Rule</i> (73 <i>Federal Register</i> 19593) ▪ All documents found under the Conservation and Land Management Documents subhead row of Table 8-3. ▪ <i>National Wetlands Mitigation Action Plan</i> (EPA and Corps 2002) ▪ <i>Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division</i> (Corps 2015) ▪ <i>State Wetland Definition and Procedures for Discharges of Dredged or Fill Material in Waters of the State</i> (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, FWS recovery plans, 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 Mono Lake, Upper Mokelumne, Upper Tuolumne, and West Walker; Calaveras River, Jeff Davis Creek, Mill Creek, Mokelumne River, Silver King Creek, Sonora Creek, and Woods Creek; 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/or enhance the chemical, physical, and biological integrity of wetlands and non-wetland waters.	See below	See below
Objective AR-2.1: Protect and 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, flood peak attenuation/flood water storage, freshwater replenishment, groundwater recharge, inland saline water habitat, migration of aquatic organisms, spawning, reproduction, early development, warm freshwater habitat, water quality enhancement, and/or 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 Mono Lake, Upper Mokelumne, Upper Tuolumne, and West Walker 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 Blue Creek, Calaveras River, Caples Creek, Mokelumne River, Stanislaus River, and Jeff Davis 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 non-native plant species that degrade stream water quality, such as annual beard grass, tree-of-heaven, giant reed, saltcedar, and perennial pepperweed. Sub-Objective AR-2.1.6: Improve stream temperatures by increasing shaded riverine aquatic habitat in the Merced, Stanislaus, and Tuolumne Rivers as well as Mill Creek, Robinson Creek, Slinkard Creek, and tributaries into June Lake for fish and other aquatic life.	▪ <i>303(d) List of Impaired Water Bodies</i> (SWRCB 2021) ▪ <i>Central Valley Flood Protection Plan 2022 Update</i> (California Department of Water Resources 2022) ▪ <i>Ecological Restoration Implementation Plan</i> (USFS 2013) ▪ <i>Integrated Regional Water Management Plan Cosumnes American Bear Yuba Watersheds, California</i> (California Department of Water Resources 2021) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005) ▪ <i>SWAP</i> (CDFW 2015a) ▪ <i>Tahoe-Sierra Integrated Regional Water Management Plan</i> (Tahoe Sierra Regional Water Management Group 2007) ▪ <i>Tuolumne-Stanislaus Integrated Regional Water Management Plan</i> (Regional Water Management Group 2017) ▪ <i>Water Quality Control Plan for the Central Valley Region</i> (Central Valley RWQCB 2019) ▪ <i>Water Quality Control Plan for the Lahontan Region</i> (Lahontan RWQCB 2021)
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 Merced, Stanislaus, and Tuolumne 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, slope wetlands, 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 and invasive 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: Restore and/or enhance and expand habitat for fish species of mitigation need.	See below	See below
Objective AR-3.1: Restore and/or enhance habitat.	Sub-Objective AR-3.1.1: Consult with FishPAC to select and implement habitat restoration and enhancement actions that support key populations and important habitat, and contribute to the recovery of threatened and endangered salmon and steelhead. Enhancement or restoration may include placement of large pieces of wood in alcoves and pools, and stream channel restoration. Sub-Objective AR-3.1.2: Consult with FishPAC to select and implement FishPAC and legislative priorities in the GAI to restore access to habitats that support key populations for recovery of threatened and endangered salmon and steelhead. The highest value for fish passage remediation and habitat restoration should be given to the current high-priority locations on the SHS (listed in each year's <i>Fish Passage Annual Report</i> to the Legislature). FishPAC priority locations have the highest biological value for recovery and should have the greatest support for remediating, both internally and from natural resource regulatory agencies.	▪ <i>2020 Fish Passage Annual Legislative Reports</i> (Caltrans 2020) ▪ <i>Lahontan Cutthroat Trout</i> (<i>Oncorhynchus clarkii henshawi</i>) <i>Recovery Plan</i> (FWS 1995) ▪ <i>Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-run Chinook Salmon and Central Valley Spring-run Chinook Salmon and the DPS of California Central Valley Steelhead</i> (NMFS 2014) ▪ <i>Revised Recovery Plan for the Paiute Cutthroat Trout</i> (<i>Oncorhynchus clarkii seleniris</i>) (FWS 2004) ▪ <i>Steelhead Restoration and Management Plan for California</i> (CDFW 1996) ▪ <i>SWAP</i> (CDFW 2015a)
Goal AR-4: Support resiliency of aquatic resources to climate change.	See below	See below
Objective AR-4.1: Reduce impacts from climate change.	Sub-Objective AR-4.1.1: Enhance and/or restore aquatic resource function and value in areas of lower climate resilience, such as the western and northernmost portions of the GAI, and at depressional wetlands and freshwater wetlands to reduce climate change effects on aquatic resources. Sub-Objective AR-4.1.2: Prioritize enhancement and/or restoration that will increase resilience to climate change such as aquatic features with hydrologic connection to the Merced, Stanislaus, and Tuolumne Rivers, as well as Calaveras River, Jeff Davis Creek, Mill Creek, Mokelumne River, Silver King Creek, Sonora Creek, and Woods Creek, 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-4.1.3: Prioritize riparian areas of the Mono Lake, Upper Mokelumne, Upper Tuolumne, and West Walker HUC-8s for enhancement and/or restoration to improve freshwater quantity and quality, floodplain connectivity, and in-stream cover continuity. Sub-Objective AR-4.1.4: Enhance, rehabilitate, establish, and/or reestablish aquatic habitats by using native species, such as box elder (<i>Acer negundo</i>), Fremont cottonwood (<i>Populus fremontii</i> ssp. <i>fremontii</i>), willows (<i>Salix</i> spp.), cattails (<i>Typha</i> spp.), rushes (<i>Juncus</i> spp.), and bulrushes (<i>Schoenoplectus</i> spp.), to reduce the effects of climate change. Sub-Objective AR-4.1.5: Reduce adverse instream flooding effects by restoring affected headwater and tributary hydrological functions for Blue Creek and the Merced, Stanislaus, and Tuolumne Rivers. Sub-Objective AR-4.1.6: Prioritize habitat establishment and reestablishment in areas that can also reduce risk in flood-prone systems, particularly in areas along Blue Creek and the Merced, Stanislaus, and Tuolumne Rivers.	▪ <i>Bishop Resource Management Plan Record of Decision</i> (BLM 1993) ▪ <i>Central Valley Flood Protection Plan 2022 Update</i> (California Department of Water Resources 2022) ▪ <i>Land Management Plan for the Inyo National Forest</i> (USFS 2019) ▪ <i>Land Management Plan for the Sierra National Forest Pre-objection Version</i> (USFS 2022) ▪ <i>Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update</i> (Upper Mokelumne River Watershed Authority 2022) ▪ <i>Mono County General Plan</i> (Mono County 2021) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005) ▪ <i>SWAP</i> (CDFW 2015a) ▪ <i>Tuolumne-Stanislaus Integrated Regional Water Management Plan</i> (Regional Water Management Group 2017) ▪ <i>Washoe Tribe of Nevada and California Integrated Resource Management Plan</i> (Washoe Tribe of Nevada and California 2008)

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
Objective AR-4.2: Improve aquatic habitat resiliency.	Sub-Objective AR-4.2.1: 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-4.2.2: 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; bullfrogs; and rainbow, brown, and brook trout that may be exacerbated by climate change such that the greatest functional lift is provided. Sub-Objective AR-4.2.3: Enhance, rehabilitate, establish, and/or reestablish small (that is, low order) tributaries/streams that discharge into larger rivers such as the Merced, Stanislaus, and Tuolumne Rivers.	Same references as listed with Objective AR-4.1.
Goal AR-5: Provide multi-resource benefits.	See below	See below
Objective AR-5.1: Maximize mitigation opportunities for multiple environmental benefits.	Sub-Objective AR-5.1.1: 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-5.1.2: Enhance and/or restore habitats for other aquatic species such as vernal pool crustaceans and plants, fish species included in Section 2.15.2, as well as species included in Appendix D, <i>Complete SAMNA Species Results</i>, that could benefit from aquatic habitat enhancement and/or restoration. Sub-Objective AR-5.1.3: Address additional RWQCB beneficial use designations, such as recreation (for example, bird watching) through enhancement, rehabilitation, establishment, and/or reestablishment actions.	▪ <i>Bishop Resource Management Plan Record of Decision</i> (BLM 1993) ▪ <i>Integrated Regional Water Management Plan Cosumnes American Bear Yuba Watersheds, California</i> (California Department of Water Resources 2021) ▪ <i>Land Management Plan for the Sierra National Forest Pre-objection Version</i> (USFS 2022) ▪ <i>Mono County General Plan</i> (Mono County 2021) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005) ▪ <i>SWAP</i> (CDFW 2015a) ▪ <i>Water Quality Control Plan for the Central Valley Region</i> (Central Valley RWQCB 2019) ▪ <i>Water Quality Control Plan for the Lahontan Region</i> (Lahontan RWQCB 2021)

8.8 Summary

Caltrans anticipates that future SHOPP and STIP-eligible transportation projects may be conditioned by the Corps, SWRCB, RWQCB, 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/or enhance the chemical, physical, and biological integrity of wetlands and non-wetland 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 direct advance mitigation planning toward fish species of mitigation need. The objectives are designed to restore and/or enhance habitat for steelhead and cutthroat salmon, and increase the survivability of these species. The sub-objectives were selected to address the following pressures and stressors: altered hydrology and water quality; habitat loss, fragmentation, and degradation; and invasive species.

Goal AR-4 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 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-5 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 describes what additional benefits exist for other resources in the GAI, including benefits to upland terrestrial habitat. This goal 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 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 10 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 10 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 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, as required.^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 <https://ppmoe.dot.ca.gov/cc>

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 and non-SHOPP, STIP-eligible 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 in the GAI for fiscal years 2023/24 to 2032/33 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 2023/24 to 2032/33, Caltrans District 10 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 and end of the planning period. Given the expected timing of mitigation need, at this time (July of fiscal year 2025/26) mitigation that can be purchased or established by fiscal year 2027/28 (within the next 2 years) could potentially address approximately:

- 1.9 acre of California red-legged frog habitat, 0.6 acre of California tiger salamander habitat, 2 acres of foothill yellow-legged frog habitat, 1.5 acres of Sierra Nevada yellow-legged frog habitat, and 1 acre of California spotted owl habitat in the Sierra Nevada Ecoregion Section, potentially contributing to the acceleration of 2, 1, 1, 2, and 2 transportation projects, respectively
- 0.6 acre of California red-legged frog habitat, 0.3 acre of California tiger salamander habitat, 0.6 acre of foothill-yellow legged frog habitat, and 0.1 acre of California spotted owl habitat in the Sierra Nevada Foothills Ecoregion Section, potentially contributing to the acceleration of 1, 1, 1, and 1 transportation projects, respectively

- 0.1 acre of non-wetland waters and up to 0.6 acre of area of potential riparian function impacts in the Upper Calaveras California sub-basin, potentially contributing to the acceleration of 1 and 1 transportation projects, respectively
- up to less than 0.1 acre of area of potential riparian function impacts in the Upper Carson sub-basin, potentially contributing to the acceleration of 1 transportation project
- Less than 0.1 acre of wetland, 0.7 acre of non-wetland waters, and 0.9 to 2 acres of area of potential riparian function impacts in the Upper Merced sub-basin, potentially contributing to the acceleration of 1, 1, and 1 transportation projects, respectively
- Less than 0.1 acre of fish habitat, less than 0.1 acre of non-wetland waters, and less than 0.1 to 0.1 acre of area of potential riparian function impacts in the Upper Mokelumne sub-basin, potentially contributing to the acceleration of 1, 1, and 1 transportation projects, respectively
- Less than 0.1 acre of fish habitat, 0.1 acre of wetland, less than 0.1 acre of non-wetland waters, and up to 0.1 acre of area of potential riparian function impacts in the Upper Stanislaus sub-basin, potentially contributing to the acceleration of 1, 1, 1, and 2 transportation projects, respectively

All or some of these needs could form the basis for District 10 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

Advance Mitigation Project Type	Authorization	Section
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
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 SWRCB does 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 the CESA and FESA, 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 2025/26), 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. Sixteen conservation banks have service areas that at least partially overlap the GAI. Of these, CDFW is a signatory to four active and one pending conservation banks, four of which offer credits for at least one of the species of mitigation need (Table 4-1). FWS is a signatory to 14 active and 1 pending conservation banks, 10 of which offer credits for at least one species of mitigation need. CDFW and/or FWS are cosignatories to five active and one pending of the conservation banks referenced above. Conservation bank service areas are shown on Figures 4-1 to 4-7, and the anticipated transportation project impact forecast on terrestrial 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 fiscal year 2026/27, when the credits might contribute to transportation project acceleration.

Feasibility. This authorized activity may be feasible. Caltrans District 10 may be able to address some of its California red-legged frog and California tiger salamander mitigation needs through pre-transfer credits purchased from conservation banks that have service areas overlapping 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 several of the species of mitigation need are 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 FESA in coordination with FWS and/or NMFS. 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 considered. In 2021, the Interagency Project Delivery Team finalized new bank templates that incorporate pre-transfer purchase terms; 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. Eight mitigation banks have service areas that at least partially overlap the GAI, all of which provide wetland, non-wetland water, or riparian credits. The Corps is a signatory, or is anticipated to be a signatory, on seven of these mitigation banks (Table 4-1, Figures 4-1 to 4-7). CDFW and/or FWS are cosignatories to eight of these banks, which could potentially provide credits for co-benefiting species.

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 bank sponsors whether additional Caltrans-specific terms would 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 are 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-specific mitigation, or purchasing credits from a conservation or mitigation bank. Additionally, it 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, FESA, 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 within 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.

One active in-lieu fee program has a service area that overlaps the GAI (Figures 4-8 and 4-9). The NFWF Sacramento District California In-lieu Fee 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

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>

² https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/banking_faq.pdf

transportation projects. Bulk 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. CDFW has released RCIS program guidelines, including guidance for the creation of MCAs.³ However, an approved RCIS is a pre-condition for MCA creation, and no active or pending RCISs have service areas that overlap the GAI.

Feasibility. At this time (July of fiscal year 2025/26), 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 CDFW⁴ 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 circumstances may occur in which the Corps and/or SWRCB would participate.

To support future transportation project conditions, a conservation bank funded through the AMA would establish CESA and FESA 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, Caltrans analyzed and synthesized the relevant and applicable information listed in Chapter 3, to develop its understanding of natural resource regulatory agency goals and objectives for the GAI. In brief, it is Caltrans' understanding that a

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

conservation bank that addresses the following goals would be consistent with CDFW and FWS goals:

- Conserve and expand habitat for species of mitigation need in the GAI to support ecosystem functions that are essential to recovery of the species (WILD-1).
- Preserve, enhance, and increase connectivity between blocks of wildlife habitat to allow for dispersal that will maintain resilience and variability of wildlife 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 previously, instructions and guidance for establishing conservation banks are available from CDFW and FWS. After the Caltrans Director's approval for funding, delivering an advance mitigation project to establish a conservation bank is expected to take 2 to 6 years before the initial credit release; the credits or values would be available to transportation projects according to the credit release schedule in the Interagency Review Team-approved BEI (CNRA et al. 2011). Caltrans may contract or subcontract bank establishment and/or implementation tasks, including site selection.

9.3.7. Mitigation Bank Establishment

Instructions and guidance for establishing mitigation banks are available from the Corps⁷ 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*

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.

⁷ https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/mitig_info/

⁸ <https://wildlife.ca.gov/Conservation/Planning/Banking/Templates>

To support future transportation project permits, Caltrans would prioritize wetlands and waters credit establishment under the Corps' jurisdiction (wetlands and WOTUS) and RWQCBs' jurisdiction (waters of the state), as well as riparian credit establishment under CDFW's Lake and Streambed Alteration Program.

Mitigation banks are wetland and waters focused, and each bank's alignment with natural resource protection is documented through its BEI. 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 the 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:

- Ensure no net loss of area, functions, values, and condition of wetland and non-wetland water resources (AR-1).
- Restore and/or enhance the chemical, physical, and biological integrity of wetlands and non-wetland waters (AR-2).
- Restore and/or enhance and expand habitat for fish species of mitigation need (AR-3).
- Support resiliency of aquatic resources to climate change (AR-4).
- Provide multi-resource benefits (AR-5).

Further, for each objective, Table 8-4 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 discussed above, instructions and guidance for establishing mitigation banks are available from the Corps and CDFW; therefore, establishing credits is feasible. After the Caltrans Director's approval for funding, delivering an advance mitigation project to establish a mitigation bank is expected to take at least 2 to 6 years before the initial credit release, at which point the credits or values would be available to transportation projects. Caltrans may contract or subcontract bank establishment and/or implementation tasks, including site selection.

9.3.8. In-lieu Fee Program Establishment

In-lieu fee programs are wetlands, waters, and/or wildlife oriented, and their alignment with natural resource protection will be documented through their enabling instrument. Instructions and guidance for establishing in-lieu fee programs are available from the

federal agencies.⁹ With respect to wildlife, similar to the Corps, FWS also follows federal guidance for establishing an in-lieu fee program; however, a supportive regulatory and administrative pathway for CDFW to develop an in-lieu fee program has not been developed.

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*
- 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 RWQCBs' jurisdiction (waters of the state). The Corps, EPA, SWRCB, and/or RWQCB 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 FESA biological assessments/opinions in coordination with FWS and NMFS.

Feasibility. This authorized activity may be feasible. As stated 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 the CESA and/or for riparian habitat 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 MCA itself. RCIS development is also an SHC § 800.6(a)-authorized advance mitigation project deliverable.

⁹ <https://www.spl.usace.army.mil/Missions/Regulatory/Mitigation/>

At this time, Caltrans cannot be an MCA sponsor.¹⁰ Therefore, Caltrans envisions that credits or values created through an MCA and funded through the AMA could be established under two scenarios:

- Caltrans funds the performance of conservation 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 that an existing RCIS anticipates the requirements and needs for MCA credits to apply to transportation projects.
- Caltrans funds the preparation of an RCIS that anticipates transportation project requirements and needs for MCA credits prior to funding the preparation of an MCA by a third-party who is the MCA sponsor, as in the scenario above.¹¹

To support future transportation project permits, an MCA or, if needed, an RCIS in concert with an MCA funded through the AMA would establish CESA and/or Lake and Streambed Alteration Program credits,¹² and CDFW would be the signatory. Caltrans may also request other natural resource regulatory agencies to be signatories to the MCA or may request project-specific interagency agreements with other natural resource regulatory agencies whose jurisdiction overlaps with CDFW's.¹³ 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 2025/26), RCIS program guidelines, which include guidance for the creation of MCAs, are available (CDFW 2023b).¹⁴ Once an MCA has been approved by CDFW, mitigation credits created through the agreement would be available to be applied to Caltrans transportation projects.

However, 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 the MCA credit or establishment process. However, given the nature of the AMP's revolving account, which sustains itself through transportation project reimbursements, Caltrans has determined that it cannot

¹⁰ CDFW's legislation requires that MCA securities take the form of a letter of credit or cash according to California FGC § 1856(g)(17), which includes and references all of FGC § 1798.5(a)(2). Caltrans cannot provide a letter of credit or cash in accordance with the prohibition against pledging the credit of the state, based on Article XVI of the California Constitution, § 6, and Government Code § 16305.3. This conflict to establish security funds will need to be resolved before Caltrans can perform the role of MCA sponsor.

¹¹ 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.

¹² Caltrans is the Lead Agency under CEQA; CDFW's permitting authority does not include conditioning transportation projects under CEQA (Section 7).

¹³ Parallel evaluations are undertaken when, for the same environmental enhancement/action, two or more agencies must employ different mechanisms to approve the credits.

¹⁴ <https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation>

commit AMA funds until the creation process can predictably deliver credits on a schedule.

Wildlife Crossing and Aquatic Corridor Enhancements

As described in Section 4.6, CDFW is authorized through FGC § 1957(a) to approve compensatory mitigation credits for wildlife connectivity actions under both the Conservation and Mitigation Banking Program and the RCIS Program. Consequently, through these mechanisms, CDFW and other natural resource regulatory agencies may be able to recognize credits established through wildlife crossing and aquatic corridor enhancement made separate and distinct from specific transportation projects. A BEI and MCA for connectivity would be consistent with Caltrans' understanding of a natural resource regulatory agency's goals and objectives to preserve, enhance, and increase connectivity between blocks of species of mitigation need habitat (WILD-2 and AR-3), support resiliency of the landscape and aquatic resources to climate change (WILD-3 and AR-4), and provide multi-resource benefits (WILD-5 and AR-5).

The AMP is authorized to fund the creation of credits through conservation banks [SHC § 800.6(a)] and MCAs created pursuant to a CDFW-approved RCIS [SHC § 800.6(b)]. FGC § 1957(a) provides a means by which the AMP could potentially fund credit establishment or creation through fish and wildlife connectivity projects. 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's guidelines for calculating wildlife crossing and aquatic corridor enhancements credits are finalized.

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 preservation¹⁵ 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 2025/26), 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 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

¹⁵ SWRCB does not typically approve establishment of or accept preservation credits.

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

Caltrans may undertake this project type if all 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 2025/26), a number of the authorized activities listed in Table 9-3 appear to be feasible (see 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 2024/25 through 2032/33 (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 2025/26), a few authorized activities appear to be feasible, and advance mitigation project scopes could cover multiple resources and address overlapping natural resource regulatory agency jurisdictions under several scenarios. For example, California red-legged frog, California tiger salamander, and seasonal wetlands could be addressed within the same credit purchase or by establishing a single credit establishment project. Under some conditions, riparian credit needs could also be addressed.

Table 9-4. Wildlife Resources Credit Options and Feasibility, July 2026

Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete ^a
Pay NCCP or NCCP/HCP fees ^b	No, no HCPs or NCCPs in GAI	No	Maybe, CDFW and FWS	Not available
Purchase conservation bank credits	Yes, may require instrument amendment	Yes, 11 active or pending FWS-approved banks, 1 NMFS-approved bank, and 4 CDFW-approved banks with service areas that overlap the GAI and offer credits for species of mitigation need (California red-legged frog, California tiger salamander, and/or steelhead). Credits available for other wildlife resources as well.	Yes, CDFW, FWS, and NMFS	1 to 3 years
Purchase in-lieu fee program credits	Yes, may require instrument amendment	Yes, one FWS-approved in-lieu fee program.	Not available	1 to 3 years
Purchase MCA credits	No, no RCISs in GAI	Not available	Not available	Not available
Establish conservation bank	Yes	Yes, with CDFW, FWS, and NMFS	Yes, with CDFW, FWS, and 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, no RCISs in GAI	No, no RCISs in GAI.	Maybe, for the CDFW program, CDFW approves the credits and allows other regulatory agencies to acknowledge MCA credits, if desired Potential for parallel evaluation(s) with other natural resource regulatory agencies	Not available

Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete ^a
Establish RCIS and MCA ^c	Yes, RCIS and MCA creation guidelines available	Yes, RCIS and MCA creation guidelines available	Maybe, for the CDFW program, CDFW approves the credits and allows other regulatory agencies to acknowledge MCA credits, if desired Potential for parallel evaluation(s) with other natural resource regulatory agencies	Not available
Establish mitigation that meets an RCIS objective	No, no RCISs in GAI	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, if associated, 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 2026

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, seven established Corps banks with available credits.	Yes, Corps, RWQCB, EPA, CDFW, FWS, and/or NMFS	1 to 3 years
Purchase in-lieu fee credits	Yes	Yes, one in-lieu fee program in the GAI; its instrument has been amended	Yes, Corps, RWQCB, EPA, and NMFS	1 to 3 years
Purchase MCA credits	No, no RCISs in GAI	Not available	Not available	Not available
Establish mitigation bank	Yes	Yes, Corps, EPA, FWS, NMFS, CDFW, and RWQCB	Yes, Corps, CDFW, EPA, FWS, NMFS, and RWQCB	2 to 6 years
Establish in-lieu fee program	Yes	Yes, for Corps, EPA, FWS, NMFS, and RWQCB	Maybe, Corps, EPA, FWS, NMFS, and RWQCB	2 to 6 years
Establish MCA credits or values ^b	No, no RCISs in GAI	No, no RCISs in GAI.	Maybe, for CDFW program, CDFW approves the credits and allows other regulatory agencies to acknowledge MCA credits, if desired Potential for parallel evaluation(s) with other natural resource regulatory agencies	Not available
Establish RCIS and MCA ^b	Yes; RCIS and MCA creation guidelines available	Yes, RCIS and MCA creation guidelines available	Maybe, for CDFW program, CDFW approves the credits and allows other regulatory agencies to acknowledge MCA credits, if desired Potential for parallel evaluation(s) with other natural resource regulatory agencies	Not available

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, no RCISs in GAI	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 areas of potential riparian function.

Caltrans District 10 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 these tables is an explicit comparison of other desired qualities, outcomes, or other factors of performing any particular authorized activity, which Caltrans District 10 will also consider based on its localized knowledge of delivering mitigation in its region. For 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, District 10 will use information in the RAMNA. Each scope will consider mitigation needs; the timing of mitigation needs; conservation data and plans; input from natural resource regulatory agencies, interested parties, and tribes; feasibility; timing; and other financial, strategic, and technical risks associated with transportation project delivery and conservation actions. Advance mitigation project scopes will also employ, as appropriate, existing applicable state and federal standards and instruments, mitigation-related agreements, advance mitigation project-specific agreements, and contracts with qualified third parties.

District 10 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, District 10 will commit to delivering the advance mitigation project within the scope, schedule, and budget communicated with nomination materials. At that point, District 10 will initiate project delivery (see Steps 6 through 10 on Figure 1-2; Caltrans 2023b). Advance mitigation project delivery includes engaging stakeholders, analyzing project alternatives, coordinating 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(s). Additionally:

- 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 or under contract to Caltrans through a competitive bid process, and may include existing mitigation providers, for example, banks, NCCPs, and 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.

10. REFERENCES

- Adams, A. J., A. P. Pessier, and C. J. Briggs. 2017. "Rapid Extirpation of a North American Frog Coincides with an Increase in Fungal Pathogen Prevalence: Historical Analysis and Implications for Reintroduction." *Ecology and Evolution* 7: 10216–10232.
- Alpine County. 2021. *Alpine County General Plan*.
- Alvarez, J. A. 2004. "*Rana aurora draytonii* (California red-legged frog) microhabitat." *Herpetological Review* 35: 162–162.
- Amador County. 2016. "Amador County General Plan." Accessed August 9, 2024. <https://www.amadorgov.org/home/showpublisheddocument/34501/637154583287970000>.
- Bixby, R. J., S. D. Cooper, R. E. Gresswell, L. E. Brown, C. N. Dahm, and K. A. Dwire. 2015. "Fire Effects on Aquatic Ecosystems: An Assessment of the Current State of the Science." *Freshwater Science* 34(4): 1340–1350.
- Bliss-Ketchum, L. L., C. E. de Rivera, B. C. Turner, D. M. Weisbaum. 2016. "The Effect of Artificial Light on Wildlife Use of a Passage Structure." *Biological Conservation* 199: 25–28.
- BLM (Bureau of Land Management). 1993. "Bishop Resource Management Plan Record of Decision." Accessed January 6, 2023. <https://eplanning.blm.gov/eplanning-ui/project/70447/510>.
- . 2021. "Sierra Resource Management Plan and Record of Decision." Accessed January 6, 2023.
- Bourque, R. 2008. Spatial Ecology of an Inland Population of the Foothill Yellow-legged Frog (*Rana boylei*) in Tehama County, California. M.S. Thesis. Humboldt State University, Arcata, California.
- Briggs, C. J., V. T. Vredenburg, R. A. Knapp, and L. J. Rachowicz. 2005. "Investigating the Population-level Effects of Chytridiomycosis: An Emerging Infectious Disease of Amphibians." *Ecology* 86(12): 3149–3159.
- Calaveras County. 2020. *Calaveras County General Plan*." Accessed August 12, 2024. <https://planning.calaverasgov.us/General-Plan>.
- CalFish. 2018. "CalFish: A California Cooperative Anadromous Fish and Habitat Data Program. PAD Tutorials." Accessed October 22, 2021. <https://www.calfish.org/ProgramsData/HabitatandBarriers/CaliforniaFishPassageAssessmentDatabase.aspx>.
- Cal-IPC (California Invasive Plant Council). 2023. "The Cal-IPC Inventory." Accessed February 15, 2023. <https://www.cal-ipc.org/plants/inventory/>.

- California Department of Fish and Game. 1996. *Steelhead Restoration and Management Plan for California*. State of California Department of Fish and Game, Inland Fisheries Division, Sacramento, California.
- California Department of Water Resources. 2016. "CalWater Hydrologic Areas." Accessed October 19, 2018. <https://www.arcgis.com/home/item.html?id=7a495cfa71ca4616aba58c5e915eef2c>.
- . 2021. *Integrated Regional Water Management Plan: Cosumnes American Bear Yuba Watersheds, California*.
- . 2022. *Central Valley Flood Protection Plan 2022 Update*. Sacramento, California.
- California Invasive Species Advisory Committee. 2010. "Invasive Species List and Scorecards for California." Accessed February 15, 2023. <https://www.iscc.ca.gov/docs/CaliforniaInvasiveSpeciesList.pdf>.
- California State Parks. 1989. *Calaveras Big Trees State Park Preliminary General Plan*. Accessed January 6, 2023. https://www.parks.ca.gov/?page_id=21299.
- Caltrans (California Department of Transportation). 2015. "Standard Environmental Reference." Volume 1: Guidance for Compliance. Chapter 17 – Floodplains. Accessed February 15, 2023. <https://dot.ca.gov/programs/environmental-analysis/standard-environmental-reference-ser/volume-1-guidance-for-compliance/ch-17-floodplains>.
- . 2018. *Advanced Mitigation Needs Assessment GIS Tool Report for California Department of Transportation*. Prepared by HDR. November 2018.
- . 2019a. *Advance Mitigation Program Final Formal Guidelines*. Version 1.0. October. Sacramento, California.
- . 2019b. *Climate Change Vulnerability Assessments. District 10 Technical Report*.
- . 2021. *2021 State Highway System Management Plan*. June 1, 2021.
- . 2022a. *Advance Mitigation Program: Great Valley Ecoregion Section Within Caltrans District 10 Regional Advance Mitigation Needs Assessment*. Version 1.0. July 2022.
- . 2022b. *California Transportation Asset Management Plan: Fiscal Years 2021/22–2031/32*. Accessed September 21, 2022. <https://dot.ca.gov/-/media/dot-media/programs/asset-management/documents/2022-tamp-a11y.pdf>.
- . 2023a. *State Highway Operation & Protection Program Ten-Year Project Book 2023/24–2032/33*. Quarter 1, Fiscal Year 2023/24. October. Sacramento, California.

- . 2023b. *Statewide Advance Mitigation Needs Assessment Report*. State Highway Operation and Protection Program. Ten-Year Project Book. Second Quarter 2021/2022 Fiscal Year. February. Sacramento, California.
<https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation>.
 - . 2023c. “Caltrans District 10 Geospatial Data for the Advance Mitigation Needs Assessment for the First Quarter of FY 2023/2024” (data file). Accessed August 6, 2024. Available upon request.
 - . 2023d. Statewide Riparian Landcover Dataset. SFEI Caltrans Task 4.0 – Add Special Aquatic Features: RipZET QA/QC Report. Funded through Contract 43A099. Richmond, California.
 - . 2023e. “Vegetation_D09/D10 in Caltrans District 10 Geospatial Data for the Advance Mitigation Needs Assessment for the First Quarter of FY 2023/2024” (data file). Accessed August 6, 2024. <https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation>.
 - . 2023f. “Waters_with_Fish_D09/D10 in Caltrans District 10 Geospatial Data for the Advance Mitigation Needs Assessment for the First Quarter of FY 2023/2024” (data file). Accessed August 6, 2024.
<https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation>.
 - . 2023g. “Wetlands_D09/D10 in Caltrans District 10 Geospatial Data for the Advance Mitigation Needs Assessment for the First Quarter of FY 2023/2024” (data file). Accessed August 6, 2024. <https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation>.
 - . 2023h. “Waters_D09/D10 in Caltrans District 10 Geospatial Data for the Advance Mitigation Needs Assessment for the First Quarter of FY 2023/2024” (data file). Accessed August 6, 2024. <https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation>.
 - . 2023i. *2023 State Highway System Management Plan*. June 1, 2023.
- Caltrans (California Department of Transportation), CDFW (California Department of Fish and Wildlife), SWRCB (State Water Resources Control Board), Corps (U.S. Army Corps of Engineers, Los Angeles District, Sacramento District, and San Francisco District), EPA (U.S. Environmental Protection Agency), FWS (U.S. Fish and Wildlife Service), NMFS (National Marine Fisheries Service), and California State Coastal Commission. 2020. *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation*. Signed January 24.
- Carson and Walker Rivers Area Committee (CWRAC). 2006. “Carson River Geographic Response Plan”. https://ndep.nv.gov/uploads/documents/crgrp_april_2006.pdf
- CDFW (California Department of Fish and Wildlife). 2000. *Western Spadefoot*. California Wildlife Habitat Relationship System. Species Life History.

- . 2015a. *California State Wildlife Action Plan, 2015 Update: A Conservation Legacy for Californians*. Edited by Armand G. Gonzales and Junko Hoshi. Prepared with assistance from Ascent Environmental, Inc. Sacramento, California.
- . 2015b. *Wildlife Connectivity across the Northern Sierra Nevada Foothills*.
- . 2016a. *California State Wildlife Action Plan: Transportation Planning Companion Plan*. Prepared by Blue Earth Consultants.
- . 2016b. *California State Wildlife Action Plan: Water Management Companion Plan*. Prepared by Blue Earth Consultants.
- . 2018a. “Terrestrial Climate Change Resilience – ACE [ds2738].” Accessed October 17, 2018. <https://wildlife.ca.gov/Data/Analysis/Ace>.
- . 2018b. “California Essential Habitat Connectivity Project.” Accessed October 17, 2018. <https://www.wildlife.ca.gov/conservation/planning/connectivity/CEHC>.
- . 2018c. “Considerations for Conserving the Foothill Yellow-Legged Frog”. Accessed July 10, 2026.
- . 2018d. *Interagency Conservation Strategy for Mountain Yellow-Legged Frogs in the Sierra Nevada (Rana sierrae and Rana muscosa)*.
- . 2019a. *California Wildlife Habitat Relationships (CWHR) System*. Supported by the California Interagency Wildlife Task Group and maintained by CDFW. Database Version 9.0.
- . 2019b. *A Status Review of the Foothill Yellow-Legged Frog (Rana boylei) in California*.
- . 2020. “BIOS – Terrestrial Connectivity – ACE [ds2734].” Accessed September 25, 2019. <https://wildlife.ca.gov/Data/CNDDDB/Maps-and-Data>.
- . 2021. “RareFind 5 – California Natural Diversity Database Online Search.” Accessed February 15, 2023. <https://www.wildlife.ca.gov/Data/CNDDDB/Maps-and-Data>.
- . 2022. *Restoring California’s Wildlife Connectivity 2022*. Biogeographic Data Branch, Sacramento, California. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=204648&inline>
- . 2023a. “Native Plants and Invasive Species.” Accessed February 15, 2023. <https://www.wildlife.ca.gov/Conservation/Plants/Invasives>.
- . 2023b. “Regional Conservation Investment Strategies Program Guidelines.” June 23. Accessed August 30, 2024. <https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=213325&inline>.

- Central Valley RWQCB (Central Valley Regional Water Quality Control Board). 2019. *The Water Quality Control Plan (Basin Plan) for the California Regional Water Quality Control Board. Central Valley Region: The Sacramento River Basin and the San Joaquin River Basin*. Fifth Edition. Revised February 2019. Accessed February 15, 2023.
https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/sacsjr_201902.pdf.
- Chicken Ranch Rancheria. 2020. Chicken Ranch Rancheria 2020 Wetland Program Plan." Accessed January 6, 2023. https://www.epa.gov/sites/default/files/2021-03/documents/chicken_ranch_rancheria_wetland_program_plan_signed_2021.pdf.
- City of Angels Camp. 2021. *Angels Camp 2020 General Plan*.
- City of Sonora. 2017. *City of Sonora General Plan*. Accessed February 6, 2023.
<https://www.sonoraca.com/city-services/general-plan/>.
- City of Sutter Creek. 2019. *Sutter Creek General Plan*.
- Cleland, D. T., P. E. Avers, W. H. McNab, M. E. Jensen, R. G. Bailey, T. King, and W. E. Russell. 1997. "National Hierarchical Framework of Ecological Units." In *Ecosystem Management Applications for Sustainable Forest and Wildlife Resources*. Edited by M. S. Boyce and A. Haney, 181–200. Yale University Press, New Haven, Connecticut.
- CNRA (California Natural Resources Agency), CDFW (California Department of Fish and Wildlife), Corps (U.S. Army Corps of Engineers), FWS (U.S. Fish and Wildlife Service), NMFS (National Marine Fisheries Service), EPA (U.S. Environmental Protection Agency), Natural Resources Conservation Service, and SWRCB (State Water Resources Control Board). 2011. *Memorandum of Understanding Concerning Mitigation and Conservation Banking and In-Lieu Fee Programs in California*. September 22.
- Corps (U.S. Army Corps of Engineers). 2015. "Final Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division USACE." Accessed October 14, 2021.
<https://www.spd.usace.army.mil/portals/13/docs/regulatory/mitigation/mitmon.pdf>.
- Crozier, L. G., M. M. McClure, T. Beechie, S. J. Bograd, D. A. Boughton, M. Carr, T. D. Cooney, J. B. Dunham, C. M. Greene, M. A. Haltuch, E. L. Hazen, D. M. Holzer, D. D. Huff, R. C. Johnson, C. E. Jordan, I. C. Kaplan, S. T. Lindley, N. J. Mantua, P. B. Moyle, J. M. Myers, M. W. Nelson, B. C. Spence, L. A. Weitkamp, T. H. Williams, and E. Willis-Norton. 2019. "Climate Vulnerability Assessment for Pacific Salmon and Steelhead in the California Current Large Marine Ecosystem." *PLoS ONE* 14(7). July 24.

- Dettinger, M., H. Alpert, J. Battles, J. Kusel, H. Safford, D. Fougères, C. Knight, L. Miller, S. Sawyer. 2018. *Sierra Nevada Summary Report. California's Fourth Climate Change Assessment*. Publication number: SUM-CCCA4-2018-004. University of California, Berkeley.
- EPA (U.S. Environmental Protection Agency). 2005. *National Management Measures to Control Nonpoint Source Pollution from Urban Areas*. EPA 841-B-05-004. Washington, D.C.
- EPA (U.S. Environmental Protection Agency) and Corps (U.S. Army Corps of Engineers). 2002. *National Wetlands Mitigation Action Plan*. Accessed February 15, 2023. <https://www.epa.gov/cwa-404/national-wetlands-mitigation-action-plan>.
- Federal Emergency Management Agency. 2020. "Flood Zones." Accessed February 15, 2023. <https://www.fema.gov/flood-zones>.
- Federal Geographic Data Committee. 2013. *Classification of Wetlands and Deepwater Habitats of the United States*. FGDC-STD-004-2013. Second Edition. Wetlands Subcommittee, Federal Geographic Data Committee and U.S. Fish and Wildlife Service, Washington, D.C.
- Federal Register*. April 10, 2008. Part II. Rules and Regulations. Vol. 73, No. 70. U.S. Department of Defense, Department of the Army, Corps of Engineers. U.S. Environmental Protection Agency. 33 CFR Parts 325 and 332 and 40 CFR Part 230, Compensatory Mitigation for Losses of Aquatic Resources; Final Rule.
- . 2010. Rules and Regulations. Vol. 75, No. 51. Department of the Interior. Fish and Wildlife Service. 50 CFR Part 17. *Endangered and Threatened Wildlife and Plants; Revised Designation of Critical Habitat for the California Red-legged Frog*; Final Rule.
- . 2014. Rules and Regulations. Vol. 79, No. 82. Department of the Interior. Fish and Wildlife Service. 50 CFR Part 17. *Endangered and Threatened Wildlife and Plants; Endangered Species Status for Sierra Nevada Yellow-Legged Frog and Northern Distinct Population Segment of the Mountain Yellow-Legged Frog, and Threatened Species Status for Yosemite Toad*; Final Rule.
- . 2023. Proposed Rules. Vol. 88, No. 36. Department of the Interior. Fish and Wildlife Service. 50 CFR Part 17. *Endangered and Threatened Wildlife and Plants; California Spotted Owl; Endangered Status for the Coastal-Southern California Distinct Population Segment and Threatened Status with Section 4(d) Rule for the Sierra Nevada Distinct Population Segment*; Proposed Rule.
- FWS (U.S. Fish and Wildlife Service). 1995. *Lahontan Cutthroat Trout (Oncorhynchus clarki henshawi) Recovery Plan*. Region 1. Portland, Oregon.
- . 2002. *Recovery Plan for the California Red-legged Frog (Rana aurora draytonii)*. Region 1. Portland, Oregon.

- . 2004. *Revised Recovery Plan for the Paiute Cutthroat Trout* (*Oncorhynchus clarkii seleniris*). Region 1. Portland, Oregon.
- . 2005. *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon*. Region 1, Portland, Oregon. December.
- . 2012. “Invasive Species.” Accessed February 15, 2023.
<https://www.fws.gov/program/invasive-species>.
- . 2017a. “Critical Habitat: What is it?” Accessed February 15, 2023.
<https://www.fws.gov/sites/default/files/documents/critical-habitat-fact-sheet.pdf>.
- . 2017b. *Recovery Plan for the Central California Distinct Population Segment of the California Tiger Salamander* (*Ambystoma californiense*). Sacramento Fish and Wildlife Office. Sacramento, California. June 2017.
- . 2020. *Paiute Cutthroat Trout 5-year Review: Summary and Evaluation*. Reno Fish and Wildlife Office. Reno, Nevada. October 2020.
- . 2021a. “Environmental Conservation Online System. Critical Habitat for Threatened & Endangered Species.” Accessed March 24, 2021.
<https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77>.
- . 2021b. “National Wetlands Inventory. Wetlands Mapper.” Accessed February 15, 2023. <https://www.fws.gov/wetlands/data/mapper.html>.
- . 2022. *Species Status Assessment Report for the California Spotted Owl* (*Strix occidentalis occidentalis*); Version 2.0. November 2022. Sacramento, California.
- . 2023a. Endangered and Threatened Wildlife and Plants; Foothill Yellow-Legged Frog; Threatened Status with Section 4(d) Rule for Two Distinct Population Segments and Endangered Status for Two Distinct Population Segments.
- . 2023b. *Species Assessment Report for Western Spadefoot* (*Spea hammondi*).
- . 2023c. *Status Review: Lahontan Cutthroat Trout* (*Oncorhynchus clarkii henshawi*).
- . 2023d. *Species Status Assessment Report for the Foothill Yellow-Legged Frog* (*Rana boylei*).
- Gonsolin, Thomas Earl. 2010. *Ecology of Foothill Yellow-Legged Frogs in Upper Coyote Creek, Santa Clara County, CA*. San Jose State University. Master's Theses. 3861.
- Grantham, T. 2018. *North Coast Summary Report. California's Fourth Climate Change Assessment*. Publication number: SUM-CCCA4-2018-001. University of California, Berkeley.
- Green, D. M., L. A. Weir, G. S. Casper, and M. J. Lannoo. 2014. *North American Amphibians: Distribution and Diversity*. University of California Press, Berkeley.

- Hayes, M. P., and M. R. Jennings. 1988. "Habitat Correlates of Distribution of the California Red-legged Frog (*Rana aurora draytonii*) and the Foothill Yellow-legged Frog (*Rana boylei*): Implications for Management." In *Management of Amphibians, Reptiles, and Small Mammals in North America*. Flagstaff, Arizona.
- Hayes, M. P., C. A. Wheeler, A. J. Lind, G. A. Green, and D. C. Macfarlane. 2016. *Foothill Yellow-Legged Frog Conservation Assessment in California*. Gen. Tech. Rep. PSW-GTR-248. U.S. Department of Agriculture, Forest Service, Pacific Southwest Research Station. Albany, California.
- Ice, G. G., D. G. Neary, and P. W. Adams. 2004. "Effects of Wildfire on Soils and Watershed Processes." *Journal of Forestry* 102(6): 16–20. September 2004.
- International Union for the Conservation of Nature. 2022. *Spea hammondi*. Prepared by SSC Amphibian Specialist Group. The IUCN Red List of Threatened Species 2022: e.T59045A53972800. Accessed July 5, 2023. <https://dx.doi.org/10.2305/IUCN.UK.2022-2.RLTS.T59045A53972800.en>.
- Jancovich, J. K., E. W. Davidson, N. Parameswaran, J. Mao, V. G. Chinchar, J. P. Collins, B. L. Jacobs, and A. Storfer. 2005. *Evidence for Emergence of an Amphibian Iridoviral Disease Because of Human-enhanced Spread*.
- Jennings, M. R., and M. P. Hayes. 1994. *Amphibian and Reptile Species of Special Concern in California*. Final report submitted to the California Department of Fish and Game, Inland Fisheries Division. Contract No. 8023.
- Jiang Y. X., Y. Y. Shi, S. Gao, and S. P. Wang. 2023. The Impact of Anthropogenic Noise, Artificial Light at Night and Road Kills on Amphibians. *Biodiversity Science* 31: 22427.
- Kupferberg, S. J. 1996. "Hydrologic and Geomorphic Factors Affecting Conservation of a River Breeding Frog (*Rana boylei*). " *Ecological Applications* 6:1332–1344.
- . 1997. "Bullfrog (*Rana catesbeiana*) Invasion of a California River: The Role of Larval Competition." *Ecology* 78(6):1736–1751.
- Lahontan RWQCB (Lahontan Regional Water Quality Control Board). 2021. *Water Quality Control Plan for the Lahontan Region*. Accessed February 16, 2023. https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/references.html.
- Mariposa County. 2023. *Mariposa County General Plan*. <https://www.mariposacounty.org/458/General-Plan#:~:text=2023%20Annual%20Report%20on%202022%20Mariposa>.
- Mariposa County Resource Conservation District. 2016. *Yosemite-Mariposa Integrated Regional Water Management Plan*.

- Matthews, K. R., and K. L. Pope. 1999. "A Telemetric Study of the Movement Patterns and Habitat Use of *Rana muscosa*, the Mountain Yellow-legged frog, in a High-Elevation Basin in Kings Canyon National Park, California." *Journal of Herpetology* 33:615–624.
- McNab, W. H., D. T. Cleland, J. A. Freeouf, J. E. Keys, Jr., G. J. Nowacki, and C. A. Carpenter, comps. 2007. *Description of Ecological Subregions: Sections of the Conterminous United States* (CD-ROM). Gen. Tech. Report WO-76B. USDA, Washington, D.C.
- Mono County. 2021. *Mono County General Plan* Accessed February 6, 2023.
<https://monocounty.ca.gov/planning/page/general-plan>.
- Mullally, D. P., and J. D. Cunningham. 1956. "Ecological Relations of *Rana muscosa* at High Elevations in the Sierra Nevada." *Herpetologica* 12: 189–198.
- Nafis, G. 2023. "Western Spadefoot – *Spea hammondi*." California Herps – A Guide to the Amphibians and Reptiles of California. Accessed July 5, 2023.
<https://www.californiaherps.com/frogs/pages/s.hammondi.html#moreinfo>.
- National Wild and Scenic Rivers System. 2016. "California." Accessed August 4, 2021.
<https://www.rivers.gov/california.php>.
- National Wildlife Federation. n.d. "Invasive Species." Accessed February 15, 2023.
<https://www.nwf.org/Educational-Resources/Wildlife-Guide/Threats-to-Wildlife/Invasive-Species>.
- NMFS (National Marine Fisheries Service). 2014. *Recovery Plan for the Evolutionarily Significant Units of Sacramento River Winter-Run Chinook Salmon and Central Valley Spring-Run Chinook Salmon and the Distinct Population Segment of California Central Valley Steelhead*.
<https://www.fisheries.noaa.gov/resource/document/recovery-plan-evolutionarily-significant-units-sacramento-river-winter-run>.
- . 2016. *Central Valley Recovery Domain. 5-Year Review: Summary and Evaluation*. California Central Valley Steelhead DPS. West Coast Region.
- NPS (National Park Service). 1980. *General Management Plan Yosemite National Park*.
https://www.nps.gov/yose/learn/management/upload/YOSE_104_D1316B_-_id338162.pdf.
- . 2014a. *Merced Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement*.
- . 2014b. *Tuolumne Wild and Scenic River Final Comprehensive Management Plan and Environmental Impact Statement*.
<https://parkplanning.nps.gov/document.cfm?parkID=347&documentID=57299>.

- Omnibus Public Land Management Act of 2009. 2009. "Public Law 111–11—Mar. 30, 2009." 123 Stat. 991. Accessed July 12, 2021. <https://www.congress.gov/111/plaws/publ11/PLAW-111publ11.pdf>.
- Pope, K. L. 1999. Mountain Yellow-legged Frog Habitat Use and Movement Patterns in a High Elevation Basin in Kings Canyon National Park. Unpublished M.S. Thesis. California State Polytechnic University, San Luis Obispo, California.
- Regional Water Management Group. 2017. *Tuolumne-Stanislaus Integrated Regional Water Management Plan*. Accessed February 15, 2023. <https://tstan-irwma.org/library/documents/>.
- SFEI (San Francisco Estuary Institute). 2015a. RipZET: The Riparian Zone Estimation Tool. Prepared by the San Francisco Estuary Institute for Caltrans – Wetlands Focus Area. Funded by Proposition 50 Watershed Protection Program Grant. Agreement Number: #10-429-550. Contribution #746. Richmond, California.
- . 2015b. RipZET: User's Manual. Prepared by the San Francisco Estuary Institute for Caltrans – Wetlands Focus Area. Funded by Proposition 50 Watershed Protection Program Grant. Agreement Number: #10-429- 550. Contribution #747. Richmond, California.
- . 2018. "California Aquatic Resource Inventory." Accessed February 15, 2023. <https://www.sfei.org/cari#sthash.SnPvzyAU.dpbs>.
- Shedd, J. D. 2016. "Distribution of the Western Spadefoot (*Spea hammondi*) in the Northern Sacramento Valley of California, with Comments on Status and Survey Methodology." In *Vernal Pools in Changing Landscapes*, R. A. Schlising, E. E. Gottschalk Fisher, and C. M. Guilliams (eds), 19–29. California State University, Chico.
- Shively, L., pers. comm. Corps, Mitigation Banking Specialist, Sacramento District. "Credit Availability Status at Bullock Bend Mitigation Bank and Meridian Ranch Mitigation Bank." Received by Caltrans Advance Mitigation Program. December 12, 2022. Comments received via email.
- Sierra Engineering. 1993. *Calaveras Country Club Specific Plan*. Accessed August 16, 2024. <https://planning.calaverasgov.us/Portals/Planning/Documents/Current%20Community%20Plans/Special%20Plans/SaddleCreek%202008%20Map/SADDLE%20CREEK%20SPECIFIC%20PLAN.pdf>.
- Spencer, W. D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California*. Prepared for Caltrans, California Department of Fish and Game, and FHWA.

- Stebbins, Robert C. 1951. *Amphibians of Western North America*. University of California Press.
- Stebbins, Robert C., and Samuel M. McGinnis. 2012. *Field Guide to Amphibians and Reptiles of California: Revised Edition* (California Natural History Guides). University of California Press.
- SWRCB (State Water Resources Control Board). 2019. "State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (for Inclusion in the Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California)." Accessed February 15, 2023.
https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/2021/procedures.pdf.
- . 2021. *2018 California Integrated Report (Clean Water Act Section 303(d) List and 305(b) Report)*. Accessed February 15, 2023.
https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2018_integrated_report.html.
- Tahoe Sierra Regional Water Management Group. 2007. *Tahoe-Sierra Integrated Regional Water Management Plan*. Accessed February 6, 2023 [no longer publicly available].
- Thomson, R. C., A. N. Wright, and H. B. Shaffer. 2016. *California Amphibian and Reptile Species of Special Concern*. California Department of Fish and Wildlife. University of California Press.
- Thorne, J. H., R. M. Boynton, A. J. Holguin, J. A. E. Stewart, and J. Bjorkman. 2016. *A Climate Change Vulnerability Assessment of California's Terrestrial Vegetation*. CDFW, Sacramento, California.
- Tuolumne County. 2018. *Tuolumne County General Plan*. Accessed February 6, 2023.
<https://www.tuolumnecounty.ca.gov/DocumentCenter/View/5782/02-TC-TOC>.
- Tuolumne-Stanislaus Integrated Regional Water Management Authority. 2017. *Tuolumne-Stanislaus Integrated Regional Water Management Plan*.
- University of California. 2015. "Natural History of the Sierra Nevada. Agriculture and Natural Resources Catalog." Publication 8535. ISBN-13: 978-1-60107-931-2
<https://anrcatalog.ucanr.edu/pdf/8535.pdf>.
- University of California, Davis, Centers for Water and Wildland Resources. 1996. *Sierra Nevada Ecosystem Project, Final Report to Congress*, Vol. III, Assessments and Scientific Basis for Management Options.
- Upper Mokelumne River Watershed Authority. 2022. "Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update." Accessed February 6, 2023. <http://www.umrwa.org/>.

- U.S. Bureau of Reclamation. 2014. *Sacramento and San Joaquin Basins Climate Impact Assessment*.
- . 2020. *Record of Decision. Reinitiation of Consultation on the Coordinated Long-Term Modified Operations of the Central Valley Project and State Water Project*.
- USDA (U.S. Department of Agriculture) Natural Resources Conservation Service. 2003. “Introduced, Invasive, and Noxious Plants.” Accessed February 15, 2023. <https://plants.sc.egov.usda.gov/noxious-invasive-search..>
- USFS (U.S. Forest Service). 1986. *Toiyabe National Forest Land and Resource Management Plan*.
- . 2013. *Ecological Restoration Implementation Plan*.
- . 2016. *Lake Tahoe Basin Management Unit Land Management Plan*.
- . 2017. *Stanislaus National Forest – Forest Plan Direction*.
- . 2019. *Land Management Plan for the Inyo National Forest*.
- . 2022. *Land Management Plan for the Sierra National Forest Pre-objection Version*.
- USGS (U.S. Geological Survey). 2014. “National Hydrology Dataset & National Watershed Boundary Dataset.” Accessed April 29, 2021. <https://www.usgs.gov/core-science-systems/ngp/national-hydrography>.
- Walth, J. pers. comm. Caltrans Senior Aquatics and Mitigation Stewardship Specialist. “Fish Passage Program, Mitigation and Advance Mitigation” Received by C. Loy, Caltrans Advance Mitigation Program. September 18, 2020. Email.
- Washoe Tribe of Nevada and California. 2008. *Washoe Tribe of Nevada and California Integrated Resource Management Plan*. Accessed February 6, 2023. <https://washoetribe.us/>.
- Water Education Foundation. 2022. “California Wild and Scenic Rivers Act.” Accessed March 3, 2022. <https://www.watereducation.org/aquapedia/california-wild-and-scenic-rivers-act>.
- Zeiner, D. C., W. F. Laudenslayer, Jr., K. E. Mayer, and M. White, eds. 1988–1990. *California’s Wildlife*. Vol. I–III. California Department of Fish and Game, Sacramento, California.