



**ADVANCE MITIGATION PROGRAM
Upper Cosumnes and Upper Mokelumne
Sub-basins
Regional Advance Mitigation
Needs Assessment**

Version 1.0

**Establishing Caltrans' Need for Advance Mitigation
for the Upper Cosumnes and Upper Mokelumne Sub-basins
forecast fiscal years 2023/24 to 2032/33**

California Department of Transportation – District 3

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
BLM	Bureau of Land Management
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEHC	California Essential Habitat Connectivity
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNRA	California Natural Resources Agency
Corps	U.S. Army Corps of Engineers
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-8	eight-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
RCIS/LCP	Regional Conservation Investment Strategy/Local Conservation Plan
RipZET	Riparian Zone Estimation Tool
RTPA	regional transportation planning agency
RWQCB	Regional Water Quality Control Board
SAMNA	Statewide Advance Mitigation Needs Assessment
SAMNA Reporting Tool	Statewide Advance Mitigation Needs Assessment Reporting Tool
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 and Protection Program Ten-Year Project Book</i>
SHS	State Highway System
SWRCB	State Water Resources Control Board
STIP	State Transportation Improvement Program
SWAP	State Wildlife Action Plan
TMDL	total maximum daily load
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
Water Boards	SWRCB and RWQCBs
WOTUS	waters of the U.S.

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EXECUTIVE SUMMARY

This *Upper Consumnes and Upper Mokelumne Sub-basins 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 3 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.

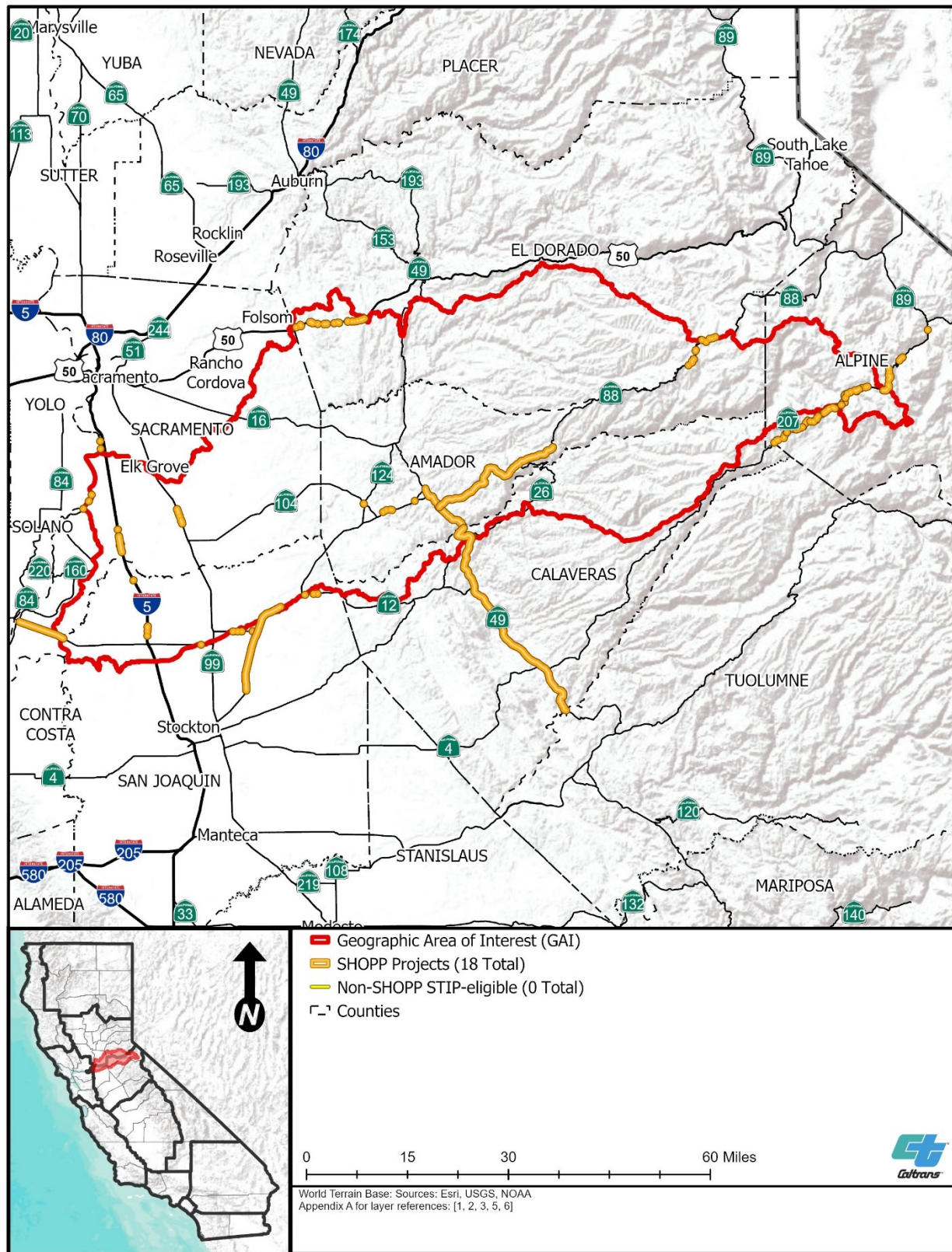
Through the RAMNA's review process, the conservation goals and objectives provided in the RAMNA were vetted with the natural resource regulatory agencies. Caltrans thinks incorporating natural resource regulatory agency goals and objectives into advance mitigation project scopes improves the chances 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 and Protection Program Ten-Year Project Book Fiscal Years 2023/24—2032/33* (“SHOPP Ten-Year Book”; Caltrans 2024a). 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 2023/24 Fiscal Year* (“SAMNA Report”; Caltrans 2024c). 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 Upper Cosumnes (eight-digit hydrologic unit code [“HUC-8”] 18040013) and Upper Mokelumne (HUC-8 18040012) sub-basins. 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 3 selected the GAI because implementing landscape-scale mitigation in the sub-basins 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 3 identified 10 species for which natural resource regulatory agencies condition transportation projects and those transportation projects that would most likely benefit if compensatory mitigation credits were available. These “species of mitigation need” are the federally threatened and California species of special concern California red-legged frog (*Rana draytonii*), depending on the location in the GAI; the federally listed as endangered or threatened, state listed as endangered or threatened, and California species of special concern foothill yellow-legged frog (*Rana boylei*); federally and state listed as threatened giant garter snake (*Thamnophis gigas*); state listed as threatened Swainson’s hawk (*Buteo swainsoni*); federally listed as threatened valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*); federally and state listed as threatened Central Valley spring-run as well as federally and state listed as endangered Sacramento River winter-run evolutionarily significant unit (“ESU”) Chinook salmon (*Oncorhynchus tshawytscha*); federally listed as threatened and state listed as endangered delta smelt (*Hypomesus transpacificus*); federally listed as threatened and California species of special concern green sturgeon (*Acipenser medirostris*); state listed as threatened longfin smelt (*Spirinchus thaleichthys*); and federally listed as threatened and California species of special concern Central Valley distinct population segment (“DPS”) steelhead (*Oncorhynchus mykiss*). The species of mitigation need co-occur with other protected plant, invertebrate, amphibian, reptile, bird,

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

and mammal species. By procuring or establishing advance mitigation credits for one or more of the species of mitigation need, Caltrans District 3 will also benefit multiple special-status species that occur and use the same habitats.

Compensatory mitigation for wetlands, non-wetland waters, and riparian habitat within the GAI was also identified as both a historical transportation project compensatory mitigation need and an anticipated future transportation project compensatory mitigation need within the GAI.

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 1.4 million acres within the Upper Cosumnes and Upper Mokelumne sub-basins (HUC-8s) and overlaps portions of the Great Valley, Sierra Nevada, and Sierra Nevada Foothills ecoregion sections.

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 148 documents that may be relevant to advance mitigation planning and mitigation project delivery: 33 state and federal laws, guidelines, and regulations; 21 statewide and regional resource management plans; 55 plans and permits and other documents focused on species of mitigation need; 11 state agency, federal agency, Native American tribal, and local government land management plans; 9 water resources plans and documents; 15 county, city, and local government general plans; and 2 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 1 HCP/NCCP for which Caltrans may be eligible to participate, 33 pending or active conservation and/or mitigation banks, 1 active or pending in-lieu fee program, no active or pending RCIS, and no MCA.

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 objectives⁷ 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 project⁸ impacts through the SAMNA model, as well as qualitative assessments of STIP-eligible transportation project needs,⁹ to define the range of its potential advance mitigation needs.

Chapter 5, *Modeled Estimated Impacts*, provides transportation project impact estimates for fiscal years 2023/24 to 2032/33. In the GAI, 18 SHOPP transportation projects and no non-SHOPP STIP-eligible transportation project 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 vernal pool habitat, wetlands, non-wetland waters, 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

⁷ 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.

⁸ Caltrans undertakes SHOPP transportation projects to address maintenance, safety, operation, and rehabilitation of the SHS; such projects do not add new capacity to the system.
<https://catc.ca.gov/programs/state-highway-operation-and-protection-program>

⁹ Metropolitan planning organizations, regional transportation planning agencies, and other public agencies also undertake transportation projects to address non-SHOPP STIP-funded transportation improvements.

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.

Table ES-1. 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
Upper Cosumnes	18040013	3	0.1	1.1	1.1
Upper Mokelumne	18040012	3	2.5	1.8	2.5
Total^b	Not applicable	6	2.6	2.9	3.6

^a The SAMNA forecasts impacts for both HUC-8s in the GAI.

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

Table ES-2. Summary of Estimated SHOPP Impacts on Non-wetland Waters in the GAI (acres)^a

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Canal/Ditch	Stream/River	Total
Upper Cosumnes	18040013	3	0.0	0.5	0.5
Upper Mokelumne	18040012	9	0.9	3.6	4.5
Total^b	Not applicable	12	0.9	4.1	5.0

^a Non-wetland water impacts are forecast by the SAMNA Reporting Tool.

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

Table ES-3. Summary of Estimated SHOPP Impacts on Riparian Function in the GAI (acres)

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Slope-based Estimate (acres) ^a	Vegetation Process-based Estimate (acres) ^a
Upper Cosumnes	18040013	3	0.0	4.3
Upper Mokelumne	18040012	10	1.7	31.0
Total^b	Not applicable	13	1.7	35.3

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

^b Totals may be different due to rounding.

Table ES-4. Summary of Estimated SHOPP Impacts on Wetlands in the GAI (acres)^a

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Depressional	Depressional Natural	Depressional Seasonal	Freshwater Emergent Wetland	Freshwater Forested/ Shrub Wetland	Freshwater Pond	Total ^b
Upper Cosumnes	18040013	3	0.2	<0.1	0.1	0.1	0.0	0.0	0.4
Upper Mokelumne	18040012	2	0.0	0.0	0.0	0.5	0.2	<0.1	0.7
Total^{b,c}	Not applicable	5	0.2	<0.1	0.1	0.6	0.2	<0.1	1.1

^a Wetland impacts are forecast by the SAMNA Reporting Tool.

^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

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

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Delta Smelt	Green Sturgeon	Lahontan Cutthroat Trout	Longfin Smelt	California Central Valley DPS Steelhead	Total
Upper Cosumnes	18040013	0	0	0	0	0	0	0
Upper Mokelumne	18040012	6	0.2	0.2	3.6	3.6	0.2	3.6
Total	Not applicable	6	0.2	0.2	3.6	3.6	0.2	3.6

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

^b The SAMNA forecasts impacts on threatened and endangered fish habitat for one of the two 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.

Table ES-6. Summary of Estimated SHOPP Impacts on Terrestrial Species of Mitigation Need within the GAI (acres)

Ecoregion Section	California Red-legged Frog: Number of Caltrans SHOPP Projects^a	California Red-legged Frog: Estimated Habitat Impact (acres)^b	Foothill Yellow-legged Frog: Number of Caltrans SHOPP Projects^a	Foothill Yellow-legged Frog: Estimated Habitat Impact (acres)^b	Giant Garter Snake: Number of Caltrans SHOPP Projects^a	Giant Garter Snake: Estimated Habitat Impact (acres)^b	Swainson's Hawk: Number of Caltrans SHOPP Projects^a	Swainson's Hawk: Estimated Habitat Impact (acres)^b	Valley Elderberry Longhorn Beetle: Number of Caltrans Projects^a	Valley Elderberry Longhorn Beetle: Estimated Habitat Impact (acres)^b
Great Valley	0	0.0	0	0.0	8	4.2	8	4.0	1	0.2
Sierra Nevada	1	32.2	1	32.2	0	0.0	0	0.0	0	0.0
Sierra Nevada Foothills	5	40.7	5	40.7	1	0.1	2	1.0	3	0.7
Total^b	5	72.9	5	72.9	9	4.3	10	5.0	4	0.9

^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.

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 2026/27), 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. Caltrans District 3 intends to prioritize purchasing or developing mitigation credits or values that are planned for the middle to the end of the 10-year planning period.

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 3 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 with 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 the terrestrial species of mitigation need
- Preserving, enhancing, and increasing connectivity between blocks of habitat supporting species of mitigation need to allow for dispersal that will maintain resilience and variability of populations
- Supporting resiliency of the landscape to climate change and sea-level rise
- Decreasing mortality and competition, and protecting population health for species of mitigation need
- Prioritizing multi-species and multi-resource benefits

Objectives and sub-objectives are provided under each of the above goals in Chapter 7, *Wildlife Resource 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 and/or enhancing and expanding habitat for the fish species of mitigation need;
- supporting resiliency of aquatic resources to climate change and sea-level rise; and
- 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. At this time (July of fiscal year 2026/27), 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 3 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 2026/27) mitigation that can be purchased or established by fiscal year 2026/27 (within the next 2 years) could potentially address approximately:

- 1.0 acre of giant garter snake habitat and 0.8 acre of Swainson's hawk habitat impacts in the Great Valley Ecoregion Section, potentially contributing to the acceleration of 2 and 2 transportation projects, respectively
- 0.2 acre of fish habitat, 0.6 acre of non-wetland waters, 0.5 acre of vernal pools, and up to 2.8 acres of area of potential riparian function in the Upper Mokelumne sub-basin, potentially contributing to the acceleration of 2, 3, 1, and 3 transportation projects, respectively

All or some of these needs could form the basis for Caltrans District 3 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 2026/27), purchasing credits approved through a bank or in-lieu fee instrument, or establishing new credits through a bank or in-lieu fee instrument, is likely feasible. The feasibility of each authorized activity to meet the forecast mitigation need in time to accelerate transportation projects will depend on the availability of a regulatory and administrative pathway and other conditions.

As pointed out above, when Caltrans scopes advance mitigation projects to establish mitigation, Caltrans intends to center the advance mitigation projects on the species of mitigation need and aquatic resources, 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, 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 *Upper Cosumnes and Upper Mokelumne Sub-basins Regional Advance Mitigation Needs Assessment* ("RAMNA"), the California Department of Transportation ("Caltrans") District 3 presents its forecast of natural resource compensatory mitigation¹ needs for the Upper Cosumnes and Upper Mokelumne sub-basins 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 Units² 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>.

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

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

1.1 AMP Overview

In 2017, the California Streets and Highways Code (“SHC”) § 800 et seq. was amended to create the AMP within Caltrans and to provide the seed capital for an Advance Mitigation Account (“AMA”), to be operated by Caltrans as a revolving account. The stated intent of the legislation is for Caltrans, through the AMP, to realize the potential of advance mitigation to both “accelerate transportation project delivery” and “protect natural resources through transportation project [compensatory] mitigation” [SHC § 800(a)]. To this end, the legislation identifies specific activities as authorized allowable expenditures under the AMA and provides for the AMA to be replenished under specific conditions. Generally speaking, the 11 activities authorized in SHC § 800.6(a) consist of purchasing or establishing compensatory mitigation credits developed through an appropriate regulatory mechanism, which are then available for use by transportation projects to offset adverse impacts (Table 1-1). Natural resource regulatory agencies and Caltrans will determine the appropriateness of a credit’s use on a case-by-case basis, when Caltrans proposes use of the credit to satisfy a specific condition placed on a transportation project.

Table 1-1. Advance Mitigation Project Types^a

Advance Mitigation Project Type	Authorization
Caltrans pays mitigation fees or other costs or payments associated with coverage of transportation projects under an approved natural community conservation plan (“NCCP”) ^b and/or an approved habitat conservation plan (“HCP”).	SHC § 800.6(a)(2)
Caltrans purchases credits from an existing conservation bank.	SHC § 800.6(a)(1)
Caltrans purchases credits from an existing mitigation bank.	SHC § 800.6(a)(1)
Caltrans purchases credits from an existing in-lieu fee program.	SHC § 800.6(a)(1)
Caltrans purchases credits developed through a mitigation credit agreement (“MCA”), established under a California Department of Fish and Wildlife (“CDFW”)-approved regional conservation investment strategy (“RCIS”). ^c	SHC § 800.6(a)(3)(A)
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated conservation bank, in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated mitigation bank in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated in-lieu fee program in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)
Caltrans funds the implementation of conservation actions and habitat enhancement actions ^{c,d} to generate mitigation credits pursuant to an MCA ^b established under a CDFW-approved RCIS. ^c The scope may include Caltrans first entering into or funding the preparation of an MCA. ^c The scope may also include Caltrans first entering into or funding the preparation of an RCIS. ^c	SHC § 800.6(a)(3) SHC § 800.6(a)(3)(A)

Advance Mitigation Project Type	Authorization
Caltrans acquires, restores, manages, monitors, enhances, and preserves lands, waterways, aquatic resources, or fisheries; or funds the acquisition, restoration, management, monitoring, enhancement, and preservation ^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 California Fish and Game Code ("FGC") § 1850–1861.

^e The State Water Resources Control Board ("SWRCB") and Regional Water Boards typically do not approve establishment of, or accept, preservation credits as the sole or primary type of mitigation.

^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 in 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")³ transportation projects will reimburse the AMA for advance mitigation project investments, thereby making the funds available to undertake the next advance mitigation project.

³ 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 Upper Cosumnes and Upper Mokelumne sub-basins.⁴

Caltrans District 3 will first use the information and analysis presented in this RAMNA to inform Step 4 of the advance mitigation planning phase. Step 4 is the point 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

⁴ 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 3 advance mitigation project for funding (Step 5; Figure 1-1; Caltrans 2019a). Thereafter, Caltrans District 3 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 programmed⁵ (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

⁵ 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 at 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 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 3 Transportation Infrastructure⁶

Headquartered in Marysville, Caltrans District 3 is responsible for maintaining and operating 1,491 centerline miles in Butte, Colusa, El Dorado, Glenn, Nevada, Placer, Sacramento, Sierra, Sutter, Yolo, and Yuba Counties. The SHS roadways range from scenic two-lane highways to controlled-access freeways. State Route 99 and Interstate 5—two major north-to-south routes connecting northern and south-central California—and Interstate 80 and U.S. Highway 50—two major east-to-west routes connecting California with states to the east—traverse Caltrans District 3.

Other transportation agencies that implement transportation improvements in the geographic area of interest (“GAI”) for this RAMNA (MPOs and other public agencies) are the Calaveras Council of Governments, Sacramento Area Council of Governments, San Joaquin Council of Governments, Alpine County Local Transportation Commission,

⁶ Adapted from: <https://dot.ca.gov/caltrans-near-me/district-3/d3-popular-links/d3-about>

Amador County Transportation Commission, and El Dorado County Transportation Commission. Some of these entities' areas of responsibility overlap Caltrans District 10. The above-listed transportation agencies are eligible for STIP funding.

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

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 Coastal Act (Public Resources Code § 30000 et seq.)
- 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 1800, Section 10 (33 USC § 403)

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

Each of the natural resource regulatory agencies listed in Table 1-2 may include compensatory mitigation as a transportation project condition after it has been determined that there will be unavoidable permanent, adverse impacts and that other efforts to minimize, rectify, and reduce the impact have been incorporated in the transportation project's design and delivery. These natural resource regulatory agencies may also recognize the use or application of a compensatory mitigation credit that was established through an instrument or other formal interagency agreement as satisfying a transportation project's compensatory mitigation conditions. As a lead agency under CEQA and NEPA, Caltrans may also determine compensatory mitigation is required.

Figure 1-3. GAI Road Infrastructure

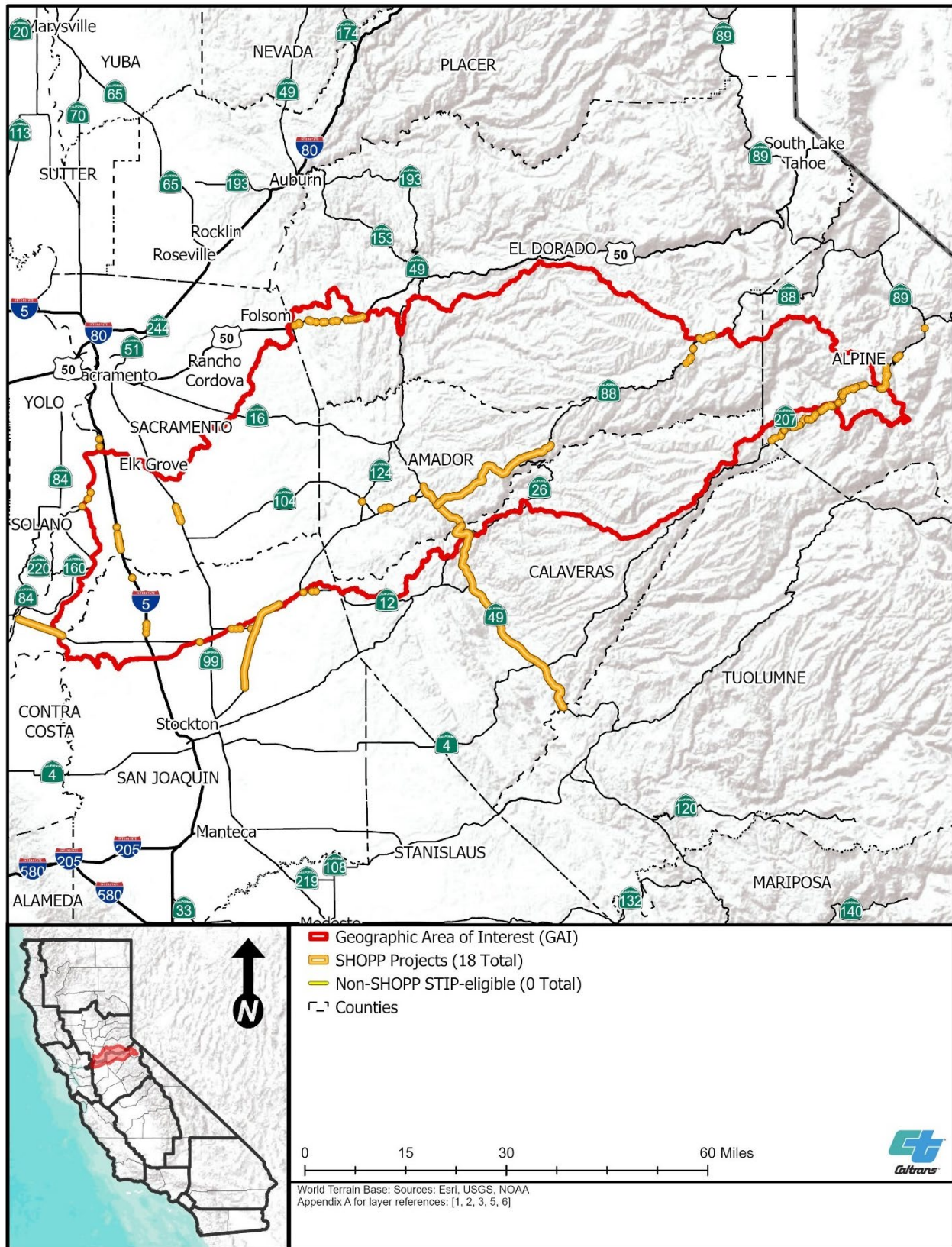


Table 1-2. Natural Resource Regulatory Agencies with Oversight over Natural Resources in the GAI

Partner	Web Address
CDFW, Bay Delta Region	https://wildlife.ca.gov/regions/3
CDFW, North Central Region	https://wildlife.ca.gov/regions/2
SWRCB	https://www.waterboards.ca.gov/
California Regional Water Quality Control Board (“RWQCB”), Central Valley and Lahontan	http://www.waterboards.ca.gov/centralvalley/ https://www.waterboards.ca.gov/lahontan/
National Marine Fisheries Service (“NMFS”) West Coast, California Central Valley Coastal Office	https://www.fisheries.noaa.gov/region/west-coast
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, Sacramento District	https://www.spk.usace.army.mil/
U.S. Environmental Protection Agency (“EPA”), Region 9	http://www.epa.gov/region9/
FWS, Sacramento Fish and Wildlife Office	https://www.fws.gov/office/sacramento-fish-and-wildlife
FWS, San Francisco Bay-Delta Fish and Wildlife Office	https://www.fws.gov/office/san-francisco-bay-delta-fish-and-wildlife

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,⁷ and in-lieu fee programs requires an instrument. Existing policies and regulations prescribe what an instrument must contain and address, as well as the terms of use for the credits generated by the mitigation bank, conservation bank, or in-lieu fee program. Similarly, establishing HCPs and NCCPs requires an agreement.

1.4 SAMNA

Predicting likely future transportation project effects on natural resources takes place at the intersection of transportation and conservation planning. In 2024, 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 2024a) for fiscal years 2023 to 2032 (Caltrans 2018, 2024b). 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 2024c). Potential impacts for all 12 Caltrans Districts were estimated. Statewide, 688 transportation projects and more than 600 wildlife and aquatic resources were evaluated through the SAMNA Reporting Tool, yielding thousands of results (Caltrans 2024c). The subset of the Caltrans District 3 transportation projects that are planned in the GAI during this RAMNA's planning period, and each associated eight-digit hydrologic unit code ("HUC" or "HUC-8"), ecoregion section, advertised year, and planned activities, 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 (2024c). 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 2024c). 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;

⁷ The goal of conservation banks is, typically, to offset adverse impacts on a species, while the goal of mitigation banking is to replace the functions and values of specific wetland and other aquatic habitats that will be adversely affected.

- do not 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 2023a). For this statewide product, SFEI used readily available data that were appropriate for the larger scale of the analysis (Caltrans 2023a). 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 (2023a). 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 2023a). 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) 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 discussed 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 3 subject matter specialists:

- reviewed the entirety of Caltrans District 3's SAMNA results by HUC-8 sub-basin and ecoregion (Caltrans 2024b; available on www.advancemitigation.dot.ca.gov);
- reviewed the SAMNA results' associated future transportation project locations and activities anticipated for the SHOPP (Caltrans 2024a);
- reviewed non-SHOPP, STIP-eligible transportation improvement plans for the next 10 years;
- noted that advance mitigation for the Lower Sacramento Basin was previously performed in 2022 (Caltrans 2022a);
- observed that the portions of Caltrans Districts 3 and 10 located within the Upper Cosumnes and Upper Mokelumne sub-basins have forecast compensatory mitigation needs during the planning period; and
- identified the Upper Cosumnes and Upper Mokelumne sub-basins as locations where Caltrans District 3, 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 Upper Cosumnes and Upper Mokelumne sub-basins form an ecological boundary and not a political boundary, some portions of the GAI overlap Caltrans District 10. In addition to Caltrans District 3, Caltrans District 10 may choose to take the lead on an advance mitigation project that would address its needs in the GAI.

1.5.2. Species of Mitigation Need

Compensatory mitigation for species in the GAI was identified as both a historical and anticipated future transportation project compensatory mitigation need within Caltrans District 3. 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, after reviewing SAMNA results for the planning period, Caltrans District 3 identified species that, if compensatory mitigation credits were available and in-hand, transportation project schedules could potentially benefit. These “species of mitigation need” are as follows:

- California red-legged frog (*Rana draytonii*), foothill yellow-legged frog (*Rana boylei*), giant garter snake (*Thamnophis gigas*), Swainson’s hawk (*Buteo swainsoni*), and valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) are terrestrial wildlife species of mitigation need. California red-legged frog is federally listed as threatened and a California species of special concern. Depending on the location in the GAI, foothill yellow-legged frog is federally listed as endangered or threatened, state listed as endangered or threatened, and a California species of special concern. Giant garter snake is federally and state listed as threatened. Swainson’s hawk is state listed as threatened. Valley elderberry longhorn beetle is federally listed as threatened.
- Central Valley spring-run and Sacramento River winter-run evolutionarily significant unit (“ESU”) Chinook salmon (*Oncorhynchus tshawytscha*), delta smelt (*Hypomesus transpacificus*), green sturgeon (*Acipenser medirostris*), longfin smelt (*Spirinchus thaleichthys*), and Central Valley distinct population segment (“DPS”) steelhead were chosen as aquatic species of mitigation need. Central Valley ESU Chinook salmon is federally and state listed as threatened. The Sacramento River winter-run Chinook salmon is federally and state listed as endangered. Delta smelt is federally listed as endangered and state listed as endangered. Green sturgeon is federally listed as threatened and a California species of special concern. Longfin smelt is state listed as threatened. Central Valley DPS steelhead is federally listed as threatened and a California species of special concern.

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*, and Chapter 8, *Aquatic Resources Conservation Goals and Objectives*.

1.5.3. Aquatic Resources

For the purposes of this document, aquatic resources include all wetlands and non-wetland waters that may be subject to Corps, EPA, SWRCB and RWQCB (or “Water Boards”), and/or CDFW regulations, as well as threatened and endangered fish that may be subject to CDFW, FWS, and/or NMFS regulations. Compensatory mitigation for aquatic resources and riparian habitat in the GAI were identified as both a historical transportation project compensatory mitigation need and an anticipated future transportation project compensatory mitigation need within Caltrans District 3. SHOPP transportation projects have historically been conditioned by natural resource regulatory agencies for these resources and have benefited from mitigation credits, when available. The GAI overlaps two HUC-8 sub-basins where compensatory mitigation for aquatic resources impacts is anticipated:

- Upper Cosumnes (HUC-8 18040013)
- Upper Mokelumne (HUC-8 18040012)

These 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*.

1.6 RAMNA

This RAMNA is a planning-level document that:

- provides a desktop analysis of relevant available information pertaining to the Upper Cosumnes and Upper Mokelumne sub-basins, 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 2024a);
- discusses potential compensatory mitigation conditions that may be placed on future transportation projects by the seven resource and regulatory agency signatories⁸ 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;

⁸ Natural resource regulatory signatories are CDFW; SWRCB; Corps Los Angeles, Sacramento, and San Francisco Districts; EPA; FWS; NMFS; and California Coastal Commission (“CCC”).

- documents Caltrans' forecast of potential wildlife and aquatic resource⁹ compensatory mitigation needs for the GAI and planning period, as reported by the SAMNA (Caltrans 2024b);
- identifies information that will be important to Caltrans when scoping any of the AMP's authorized activities in the GAI, in accordance with SHC § 800.6(a), including documenting the existing compensatory mitigation supply;
- incorporates information and feedback received from outreach to the natural resource regulatory agencies, FHWA, MPOs, RTPAs, other public agencies that implement transportation projects, Native American tribes, interested parties, and the public; and
- analyzes Caltrans' options to meet its compensatory mitigation needs in the GAI through the AMP's authorized activities.

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

1.7 Coordination History

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

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

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 3 Transportation Planning has regularly scheduled meetings with regional and local partners. At this time (July 2026), no STIP transportation projects in their planning phase and located in the GAI were identified for the planning period.

⁹ *Aquatic resources* is defined in Section 1.5.3, footnote 7.

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(s)
CDFW ^a	May 19, 2025
Corps	May 2, 2025
Water Boards	May 16, 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, Corps, FWS, and Caltrans	May 7, 2025
FWS and Caltrans	June 11, 2025
CDFW and Caltrans	June 13, 2025
SWB and Caltrans	June 27, 2025

1.8 Document Organization

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

Table 1-5. Document Organization

Chapter	Title	Content
Chapter 1	Introduction	This chapter introduces the RAMNA, placing it in context of the AMP Guidelines, transportation network, and regulatory framework.
Chapter 2	Environmental Setting	This chapter describes the GAI analyzed in the RAMNA. It relies on geospatial data from the SAMNA Reporting Tool and other readily available information.
Chapter 3	Relevant Plans, Policies, and Regulations	This chapter briefly describes laws; regulations; and comprehensive, conservation, and land management plans that are applicable and relevant to the GAI that can inform both regional understanding and advance mitigation scoping.
Chapter 4	Existing Mitigation Opportunities	This chapter summarizes the mitigation credits (or similar) currently available to Caltrans and/or pending that are applicable to the environmental resources discussed in the RAMNA and located within or in the vicinity of the GAI.
Chapter 5	Modeled Estimated Impacts	This chapter summarizes the SAMNA forecast and regional estimates of compensatory mitigation need for the GAI.
Chapter 6	Benefiting Transportation Project Considerations	This chapter summarizes relevant information about potentially benefiting transportation projects, including scheduling considerations and constraints. A time frame for the need for forecast mitigation is provided and analyzed. The potentially benefiting transportation projects' acceleration priorities are documented in this chapter.
Chapter 7	Wildlife Resources Conservation Goals and Objectives	This chapter presents Caltrans' understanding of the GAI's wildlife conservation goals and objectives, with which Caltrans seeks to align its advance mitigation projects.
Chapter 8	Aquatic Resources Conservation Goals and Objectives	This chapter presents Caltrans' understanding of the GAI's aquatic, wetland, and water resources conservation goals and objectives, with which Caltrans seeks to align its advance mitigation projects.

Chapter	Title	Content
Chapter 9	Assessment of Authorized Activities	This chapter describes options and analyzes the feasibility of purchasing and/or establishing mitigation credits (or similar) in the GAI that have a high probability of successfully accelerating transportation project delivery and protect natural resources through transportation project mitigation.
Chapter 10	References	This chapter lists references cited in the RAMNA.
Appendices	Various	Appendices supporting this document: Appendix A – GIS Sources Appendix B – 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 Appendix H – Conservation and Mitigation Bank Service Areas

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

2.1 Ecoregion Sections in the GAI

The GAI consists of approximately 1.4 million acres within the Upper Cosumnes and Upper Mokelumne sub-basins (HUC-8s) and overlaps portions of the Great Valley, Sierra Nevada, and Sierra Nevada Foothills ecoregion sections (Table 2-1, 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). Each ecoregion section is part of a larger province (McNab et al. 2007; Table 2-1).

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 management by CCC, CDFW, FWS, and/or NMFS regulations.

² Since no STIP-eligible transportation projects are anticipated, no STIP-eligible transportation projects are mapped.

Figure 2-1. Ecoregion Sections in the GAI

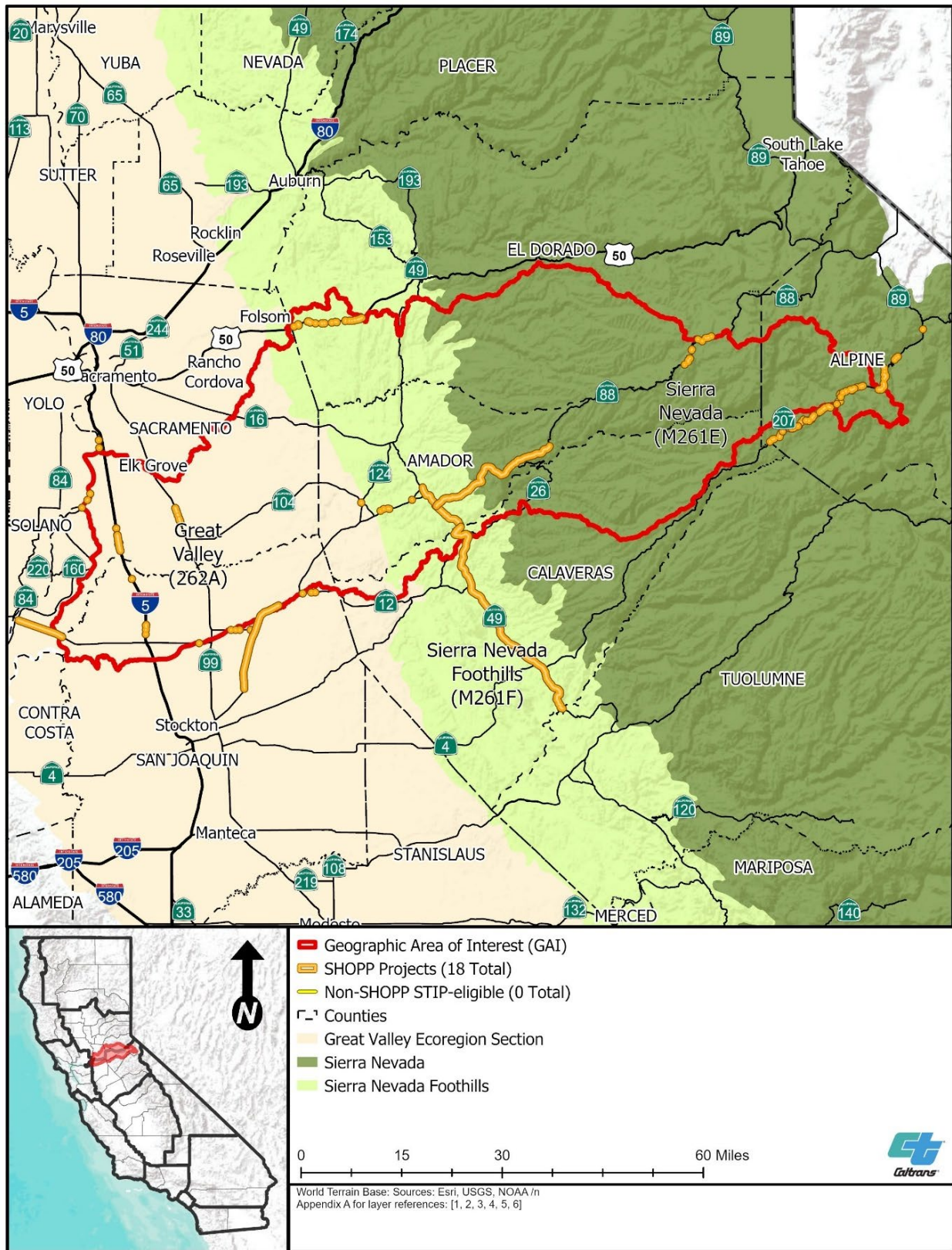


Table 2-1. Ecoregion Sections in the GAI

Ecoregion Section	Province^a	Acreage^b	Ecoregion Section as Percentage of GAI
Great Valley	California Dry Steppe	491,857	34.7
Sierra Nevada	Sierran Steppe – Mixed Forest – Coniferous Forest – Alpine Meadow	618,589	43.7
Sierra Nevada Foothills	Sierran Steppe – Mixed Forest – Coniferous Forest – Alpine Meadow	306,448	21.6
Total	Not applicable	1,416,894	100%

Source: Caltrans (2024b)

^a McNab et al. (2007)

^b Numbers were rounded to the nearest whole number.

2.2 Land Ownership

The GAI spans parts of Alpine, Amador, Calaveras, Contra Costa, El Dorado, Sacramento, San Joaquin, and Yolo Counties (Figure 2-2). Most of the land in the GAI (70 percent) is privately owned and managed (Figure 2-2, Table 2-2). Privately owned and managed land accounts for most of the land in the GAI at 66.8 percent. Federal lands, which account for 24.3 percent of the land in the GAI, are administered and managed by USDA's USFS; the U.S. Department of the Interior's Bureau of Land Management ("BLM"), and FWS. USFS land includes Eldorado and Stanislaus National Forests. Land governed by counties, cities, and special districts accounts for 2.5 percent of the GAI. State lands, which account for 1.1 percent of the GAI, include lands owned and managed by CDFW, California Department of Forestry and Fire Protection, California Department of Parks and Recreation, California Department of Water Resources, California State Lands Commission, and other public lands. Other lands in the GAI, which account for 5.3 percent of the GAI, are owned or managed by Native American tribes and non-profit conservancies and land trusts (Figure 2-2, Table 2-2).

Figure 2-2. Land Ownership

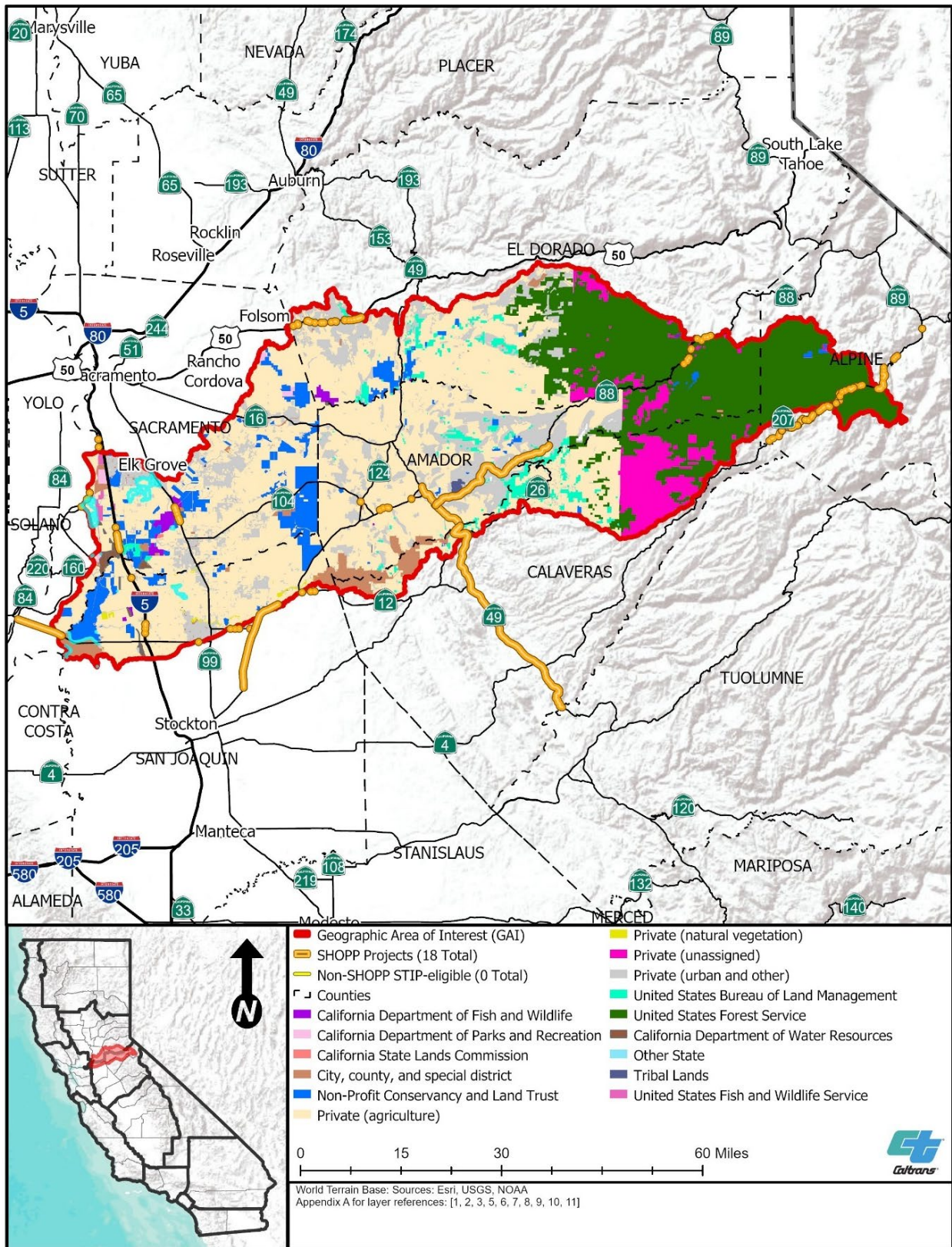


Table 2-2. Land Ownership in the GAI

Land Owner or Land Use	Number of Parcels	Total Acreage per Agency/Owner ^a	Ownership as Percentage of GAI ^b
Private (agricultural)	4,356	677,687	47.8
USFS	76	309,331	21.8
Private (urban and other)	1,090	203,966	14.4
Non-profit conservancy and land trust	310	73,844	5.2
Private (unassigned)	4	63,573	4.5
City, county, and special district	407	34,856	2.5
BLM	252	33,155	2.3
CDFW	43	7,092	0.5
California Department of Water Resources	28	3,704	0.3
California Department of Parks and Recreation	23	3,149	0.2
Private (natural vegetation)	27	2,368	0.2
FWS	35	2,223	0.2
Tribal lands	4	1,520	0.1
California Department of Forestry and Fire Protection	8	1,201	0.1
California State Lands Commission	6	398	<0.1
Private (unassigned)	4	349	<0.1
Other state	3	16	<0.1
Total^c	6,672	1,418,425	100%

Sources: U.S. Bureau of Indian Affairs, California Protected Lands Database, California Conservation Easement Database, Caltrans (2024b), U.S. Census Bureau, USDA, and California Department of Technology for land parcels

^a Numbers were rounded to the nearest whole number.

^b Totals may be different due to rounding.

^c The GAI total includes the water areas, whereas the ecoregion section GAI total does not.

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 more than 1,000 public agencies and non-profit organizations. These protected lands are managed for the preservation of biological diversity and other natural, recreational, and cultural uses. It is important to note, however, that these data are based on best available public information at the time of development and, as such, may not represent all protected lands in California.

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 located within the national forests in the eastern portion of the GAI, with GAP status 2 and 3 lands scattered throughout the western portion of the GAI. GAP Status 3 and 4 lands are located at the southern borders of the GAI. Lands with conservation easements are also identified in the California Protected Areas Database; many of the planned SHOPP transportation projects are close to conservation easements (Figure 2-3).

In addition, the California Conservation Easement Database, also developed by the GreenInfo Network, provides an inventory of easements and deed-based restrictions on private land. These restrictions limit land uses to those compatible with maintaining the land as open space. These lands under easement may be actively farmed, grazed, forested, or held as nature reserves. Easements are typically held on private lands with no public access, and may include easements held by land trusts and non-profit organizations, local jurisdictions (city and county), and state and national agencies.

2.3 Topography

The GAI is located in central California, located within portions of the Sacramento Valley to the west and the Sierra Nevada Mountains to the east. Elevations in the GAI range from sea level to 10,388 feet above mean sea level (Figure 2-4).

Figure 2-3. Protected Lands

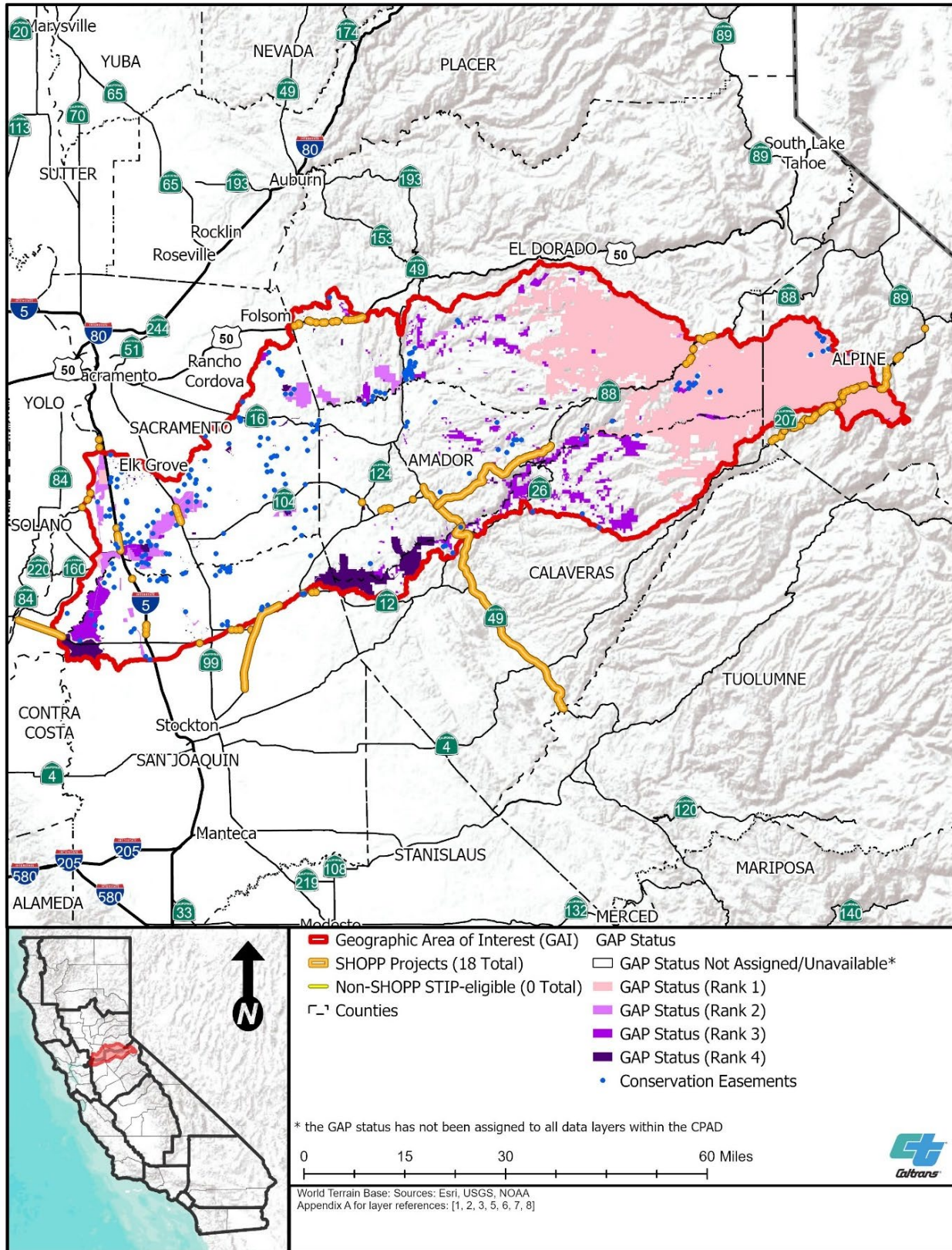
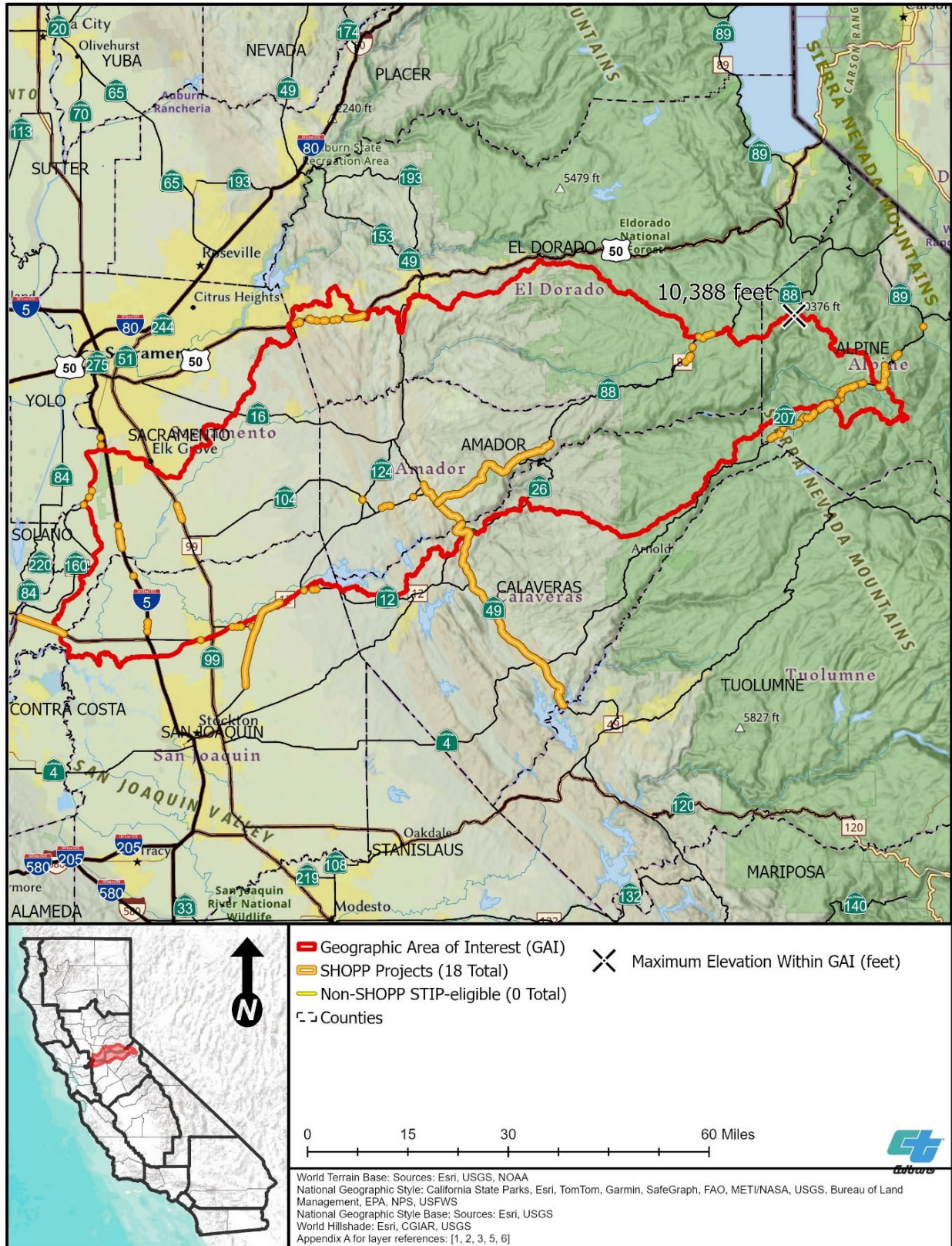


Figure 2-4. Topography



2.4 Climate

The GAI is characterized by a Mediterranean climate with cool, wet winters and hot, dry summers, with slightly warmer summers and cooler winters farther east. Average winter temperatures range from 30 to 55 degrees Fahrenheit. Average summer temperatures range from the 60 to 100 degrees Fahrenheit. Average annual precipitation ranges from 18 inches at lower elevations to over 85 inches at the highest elevations, with most precipitation occurring in November through April. Snow is common at higher elevations during winter, with snowmelt providing a major source of water during the dry summer months (California Department of Water Resources 2021; Central Valley RWQCB 2018; Regional Water Authority 2018).

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

From 2017 through 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 3 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 in 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).

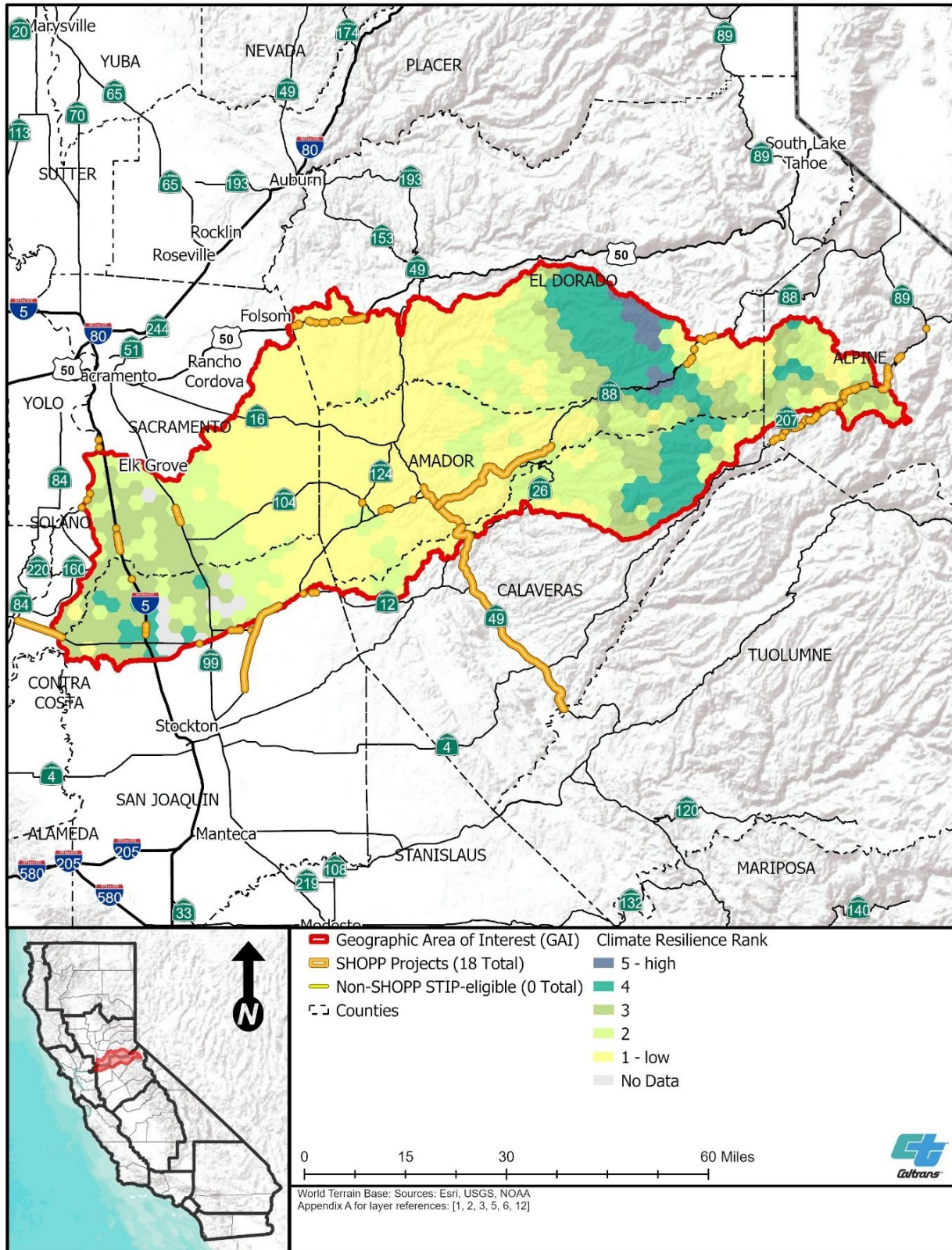
The effects of climate change in the GAI pose risks for transportation infrastructure, reliability, and capacity. Transportation systems were designed for historical climate conditions; changing climatic conditions, including an increased frequency of extreme weather events, are expected to cause disruptions and damage to the SHS. Predicted climate change effects consist of increased summer temperatures and extreme heat events; increased heavy precipitation events, with dry years becoming drier and wet years becoming wetter; and an increased risk of wildfire and flooding over the three time periods analyzed in the technical report (Caltrans 2019b). Climate change effects during the three future 30-year periods are expected to exacerbate coastal hazards, including storm surges that increase tidal bay flooding in coastal areas, erosion, scour, and washouts underneath the SHS, damaging highways, drainage infrastructure, and rock slope shore protection; increase flooding, landslide, and mudslide frequency; and worsen the severity of wildfires, which can destabilize slopes, destroy roadside infrastructure, and cause debris to collect in drainage infrastructure (Caltrans 2019b).

2.4.2. Climate Resiliency

A climate change-resilient natural community area is a terrestrial location expected to remain stable in the face of climate change (CDFW 2018a). The predicted resilience of the GAI to effects resulting from climate change was acquired from CDFW's Areas of Conservation Emphasis ("ACE," version 3) terrestrial climate change resilience dataset. This dataset consists of the modeled probability that a given terrestrial location may function as a plant or wildlife refugium from climate change, meaning that it would be relatively buffered from the effects of climate change, conditions would likely remain suitable for plants and wildlife currently residing in the area, and ecological functions would be more likely to remain intact. The ACE dataset combines climate refugia model results from eight future climate scenarios based on different combinations of global climate models, emissions scenarios, and time horizons. The eight scenarios assessed included two potential future climates—both a hotter and drier future, and a warmer and wetter future; two future carbon dioxide 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. The terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a) is presented on Figure 2-5. There is a clear pattern of low resilience in the central areas of the GAI, and areas with moderate to high resilience on the western and eastern edges of the GAI (Figure 2-5).

Figure 2-5. Terrestrial Climate Resilience Rankings



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 2024d). Based on these data, tree-dominated habitats account for the largest habitat type, encompassing 48.2 percent of the GAI, with Sierran mixed conifer being the most common (Table 2-3; Appendix C). Herbaceous-dominated habitats account for 22.5 percent of the GAI, with annual grassland the most common. Developed and non-vegetated habitat types (barren areas) combined account for 22.5 percent of the GAI, with cropland the most common. Shrub-dominated habitats account for 5.1 percent of the GAI, with montane chaparral the most common. Aquatic habitats account for 1.6 percent of the GAI, with lacustrine the most common. Land cover is generally shown on Figure 2-6.

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 (FWS 2005a).

Three organizations maintain invasive species databases for California. The Invasive Species Council of California maintains a list of invasive plant and animal species throughout the state of California (California Invasive Species Advisory Committee 2010). The California Department of Food and Agriculture also maintains a list of noxious weeds for California (USDA Natural Resources Conservation Service 2003). The California Invasive Plant Council ("Cal-IPC") maintains a California invasive plant inventory that categorizes nonnative plant species based on the severity of their potential ecological impacts (Cal-IPC 2024).

Table 2-3. Land Cover Types in the GAI

CWHR Habitat Type	Acres^a	Cover as Percentage of GAI^b
Tree-dominated Habitats	684,691	48.21
Aspen	42	<0.01
Blue Oak Woodland	83,995	5.91
Blue Oak Woodland; Blue Oak-Foothill Pine	34,377	2.42
Blue Oak-Foothill Pine	4,281	0.30
Blue Oak-Foothill Pine; Blue Oak Woodland	28,357	2.00
Closed-cone Pine-Cypress	138	0.01
Coastal Oak Woodland	<1	<0.01
Douglas Fir	10,273	0.72
Eastside Pine	11	<0.01
Eucalyptus	1,123	0.08
Jeffrey Pine	5,586	0.39
Lodgepole Pine	2,821	0.20
Montane Hardwood	103,791	7.31
Montane Hardwood-Conifer	35,981	2.53
Montane Riparian	1,539	0.11
Ponderosa Pine	62,839	4.42
Red Fir	69,738	4.84
Sierran Mixed Conifer	207,062	14.58
Subalpine Conifer	3,367	0.24
Valley Foothill Riparian	13,110	0.92
Valley Oak Woodland	4,326	0.30
White Fir	12,935	0.91
Shrub-dominated Habitats	73,056	5.14
Alpine Dwarf-Shrub	46	<0.01
Chamise-Redshank Chaparral	5,789	0.41
Coastal Scrub	306	0.02
Low Sage	5	<0.01
Mixed Chaparral	29,246	2.06
Montane Chaparral	37,642	2.65

CWHR Habitat Type	Acres ^a	Cover as Percentage of GAI ^b
Sagebrush	20	<0.01
Herbaceous-dominated Habitats	319,902	22.53
Annual Grassland	275,032	19.37
Fresh Emergent Wetland	6,122	14.41
Pasture	15,349	0.43
Perennial Grassland	20,826	1.08
Saline Emergent Wetland	760	0.05
Wet Meadow	1,813	0.13
Aquatic Habitats	23,105	1.63
Lacustrine	14,818	1.04
Riverine	8,287	0.58
Developed Habitats	290,783	20.47
Cropland	192,930	13.58
Deciduous Orchard	17,521	1.23
Evergreen Orchard	56	<0.01
Irrigated Row and Field Crops	1,141	0.08
Urban	68,122	4.80
Vineyard	11,014	0.78
Non-vegetated Habitats	28,670	2.02
Barren	28,670	2.02
Total^c	1,420,206	100%

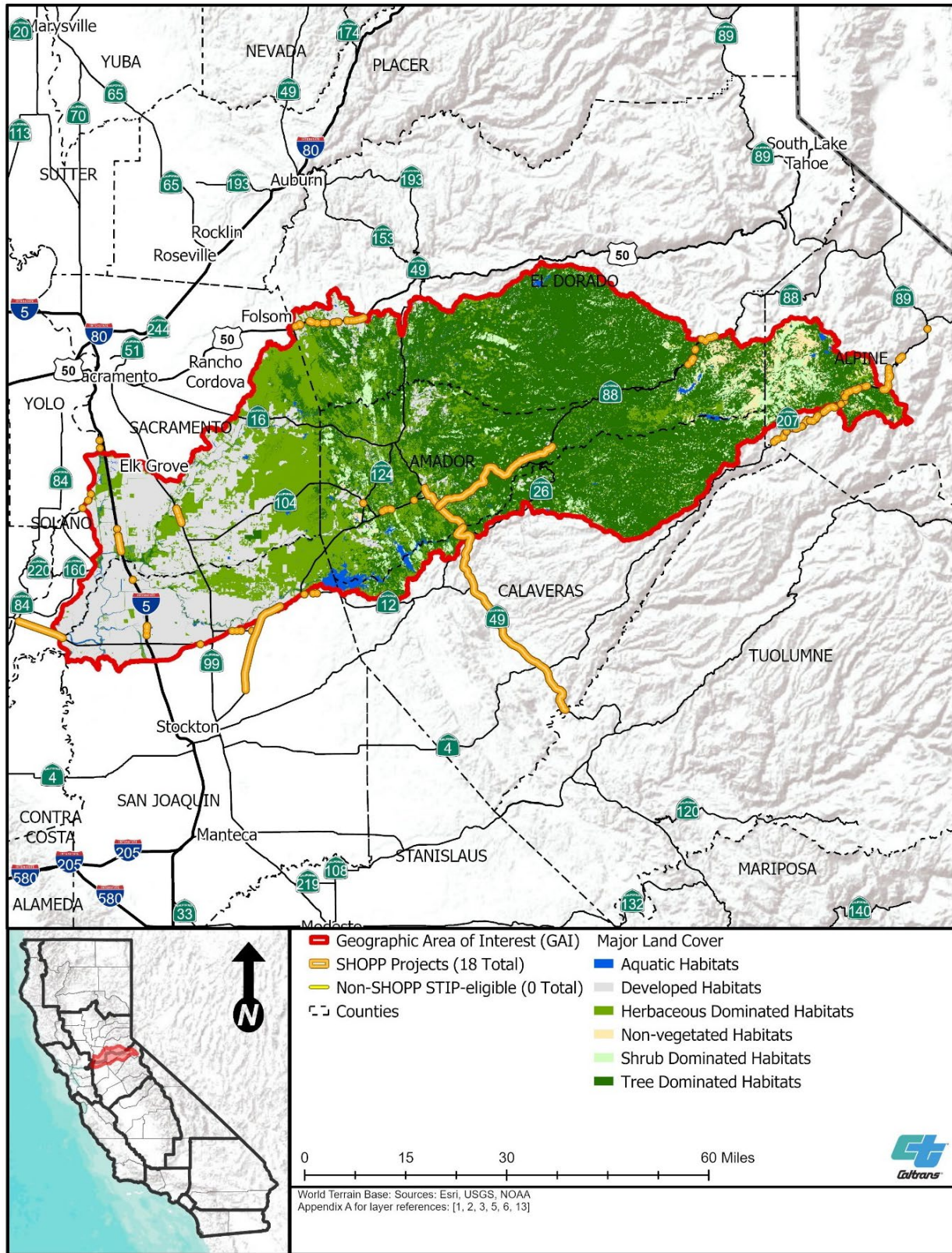
Source: Caltrans (2024d)

^a Numbers were rounded to the nearest whole number.

^b Numbers were rounded to the hundredths.

^c Totals may be different on account of rounding.

Figure 2-6. Major Land Cover^a



^a For greater detail, see Appendix C.

In the GAI, invasive plant species have been specifically identified as threats or stressors to terrestrial and aquatic biological resources (CDFW 2018b). Nonnative, invasive plant species with a high ranking by Cal-IPC are those that have the most severe ecological effects and are the most widely distributed geographically, although species with a moderate or limited ranking can also have negative local ecological effects.

Invasive plant species in the GAI that are identified as problematic in the California SWAP or the Cal-IPC inventory include, but are not limited to, barbed goatgrass (*Aegilops triuncialis*), tree of heaven (*Ailanthus altissima*), giant reed (*Arundo donax*), wild oat (*Avena barbata* and *A. fatua*), false brome (*Brachypodium distachyon*), black mustard (*Brassica nigra*), field mustard (*Brassica rapa*), ripgut brome (*Bromus diandrus*), soft brome (*Bromus hordeaceus*) red brome (*Bromus rubens*), Italian thistle (*Carduus tenuiflorus* and *C. pycnocephalus*), diffuse knapweed (*Centaurea diffusa*), tocalote (*Centaurea melitensis*), yellow starthistle (*Centaurea solstitialis*), spotted knapweed (*Centaurea stoebe* ssp. *micranthos*), rush skeletonweed (*Chondrilla juncea*), bull thistle (*Cirsium vulgare*), poison hemlock (*Conium maculatum*), pampas grass (*Cortaderia selloana*), Bermuda grass (*Cynodon dactylon*), annual dogtail (*Cynosurus echinatus*), orchardgrass (*Dactylis glomerata*), stinkwort (*Dittrichia graveolens*), medusahead (*Elymus caput-medusae*), redstem filaree (*Erodium cicutarium*), oblong spurge (*Euphorbia oblongata*), rattail fescue (*Festuca myuros*), edible fig (*Ficus carica*), fennel (*Foeniculum vulgare*), French broom (*Genista monspessulana*), cutleaf geranium (*Geranium dissectum*), rabbitsfoot grass (*Polypogon monspeliensis*), radish (*Raphanus sativus*), black locust (*Robinia pseudoacacia*), Himalayan blackberry (*Rubus armeniacus*), red sorrel (*Rumex acetosella*), curly dock (*Rumex crispus*), Russian thistle (*Salsola tragus*), blessed milkthistle (*Silybum marianum*), Spanish broom (*Spartium junceum*), saltcedar (*Tamarix ramosissima*), hedgeparsley (*Torilis arvensis*), puncture vine (*Tribulus terrestris*), rose clover (*Trifolium hirtum*), common mullein (*Verbascum thapsus*), and big periwinkle (*Vinca major*) (Cal-IPC 2024; CDFW 2015).

Nonnative animals that are/may be present in the GAI and that can negatively affect aquatic species include American bullfrog (*Lithobates catesbiana*), quagga mussels (*Dreissena bugensis*), zebra mussels (*Dreissena polymorpha*), New Zealand mud snail (*Potamopyrgus antipodarum*), nonnative crayfish, red-eared slider (*Trachemys scripta elegans*), Chinese mitten crab (*Eriocheir sinensis*), western mosquitofish (*Gambusia affinis*), and introduced sport and bait fish, including sunfish, striped bass (*Morone saxatilis*), black crappie (*Pomoxis nigromaculatus*), bluegill (*Lepomis macrochirus*), brook trout (*Salvelinus fontinalis*), and brown trout (*Salmo trutta*) (CDFW 2015).

Nonnative animals that are/may be present in the GAI and can negatively affect terrestrial wildlife through competition, predation, or parasitism include feral pigs (*Sus scrofa*), European starlings (*Sturnus vulgaris*), and brown-headed cowbirds (*Molothrus ater*). Invasive animal species that are/may be associated with urban areas include domestic dogs (*Canis lupus familiaris*) and domestic cats (*Felis catus*) (CDFW 2015).

2.7 Special-status Species

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

Special-status species with the potential to 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 2019a), Jepson Herbarium's floristic province layer, CDFW's RareFind 5 database (CDFW 2019b), and other information (Caltrans 2024b; Appendix D).

Special-status species included 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, 262 non-fish special-status species are known to occur or have the potential to occur in the GAI (88 species in the Great Valley ecoregion, 83 species in the Sierra Nevada ecoregion, and 91 species in the Sierra Nevada Foothills ecoregion).

Although it is the best information currently available, the SAMNA Reporting Tool's species list is uncertain (Appendix D). The species-attributed list developed for the SAMNA Reporting Tool depends on a species having a defined geographic range within the CWHR or having occurrences documented in the California Natural Diversity Database (Caltrans 2024c). When CWHR home range and/or California Natural Diversity Database occurrence information is incorrect or out-of-date, the probability that a species will be misidentified as potentially present increases. Hence, SAMNA results go through a sensibility evaluation prior to being used to inform advance mitigation scoping (Appendix D). Further, although SAMNA data layers and results are suitable to assist with advance mitigation project scoping, establishing compensatory mitigation credits approved by one or more natural resource regulatory agencies require 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 nine species (FWS 2021a; NMFS 2021a):

- California red-legged frog (*Rana draytonii*)
- California tiger salamander (*Ambystoma californiense*)
- Delta smelt (*Hypomesus transpacificus*)
- fleshy owl's-clover (*Castilleja campestris* ssp. *succulenta*)
- Sacramento Orcutt grass (*Orcuttia viscida*)
- Sierra Nevada yellow-legged frog (*Rana 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.

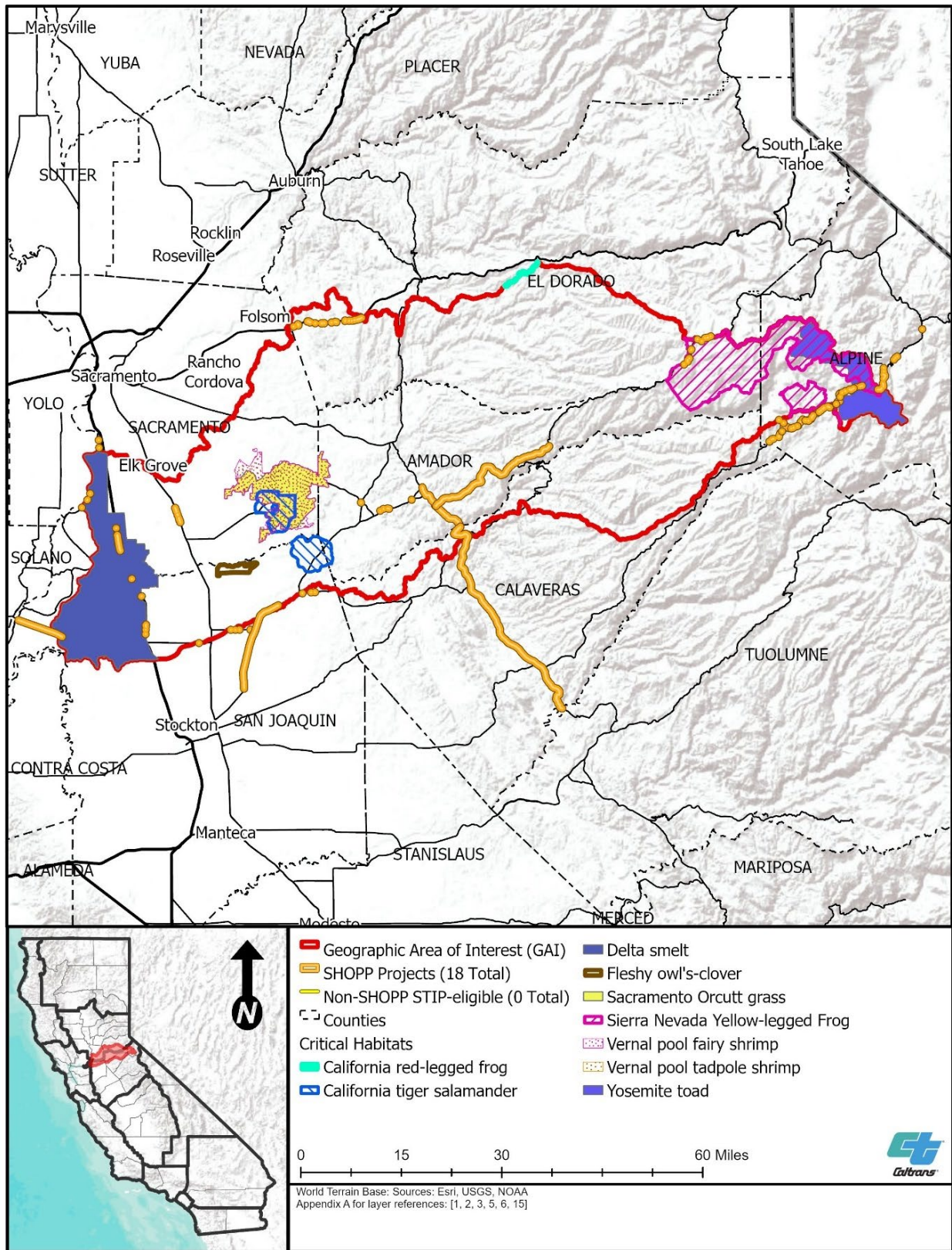
2.9 Connectivity

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 2022).

2.9.1. Wildlife Movement

Caltrans identified four connectivity assessments applicable and relevant to the GAI: the California Essential Habitat Connectivity (“CEHC”) Project, ACE, the Sierra Nevada Foothills Wildlife Connectivity Modeling Project, and CDFW's *Restoring California's Wildlife Connectivity 2022* report. Each is briefly summarized below.

Figure 2-7. Federally Designated Critical Habitat



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 (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 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 4 or 5, followed by areas with a connectivity rank of 2 or 3, and fewer planned transportation projects occurring in areas with a connectivity rank of 1 (Figure 2-8).

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 (*Odocoileus hemionus*) and other large mammals between the Central Valley and Sierra Nevada. It identifies core habitat areas or landscape blocks for nine focal passage species and connections between these core areas, including riparian corridors and other linkages (Figure 2-9) (CDFW 2013).

CDFW's Restoring California's Wildlife Connectivity 2022 Report

CDFW's *Restoring California's Wildlife Connectivity 2022* report identified priority wildlife connectivity project locations based on barriers created by linear infrastructure across the state, including the SHS, railroads, canals, high-speed rail alignments, and local roads, to help focus financial resources on improving wildlife movement (CDFW 2022). In addition to impeding wildlife movement, these barriers act as sources of mortality and affect population demographics, gene flow, resilience, and persistence of California's wildlife. Barriers were identified using existing connectivity and road crossing studies, collared-animal movement data, roadkill observations, and professional expertise. This report is an update to the 2020 priority barrier dataset; it includes an updated list of priority wildlife barriers in each region, identifies additional wildlife barriers across the state, and identifies two top priority barriers in each region. A total of 150 segments of linear infrastructure was identified as wildlife barriers, with 62 identified as priority wildlife barriers and 12 on the statewide top priority list (CDFW 2022).

Three priority wildlife movement barriers on the SHS were identified in the GAI. These barriers and the target species for movement include: (1) Culvert on Highway 12 in San Joaquin County (giant garter snake, Pacific pond turtle [*Actinemys marmorata*], mink [*Neogale vison*], river otter [*Lontra canadensis*], and all other reptiles and mammals in the area); (2) Highway 4 Alpine County in Alpine County (mule deer, mountain lion [*Puma concolor*], and black bear [*Ursus americanus*]); and (3) Highway 50 Cameron Park to Shingle Springs, bisects Sierra Nevada in El Dorado County (mule deer, mountain lion, and black bear) (CDFW 2022).

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

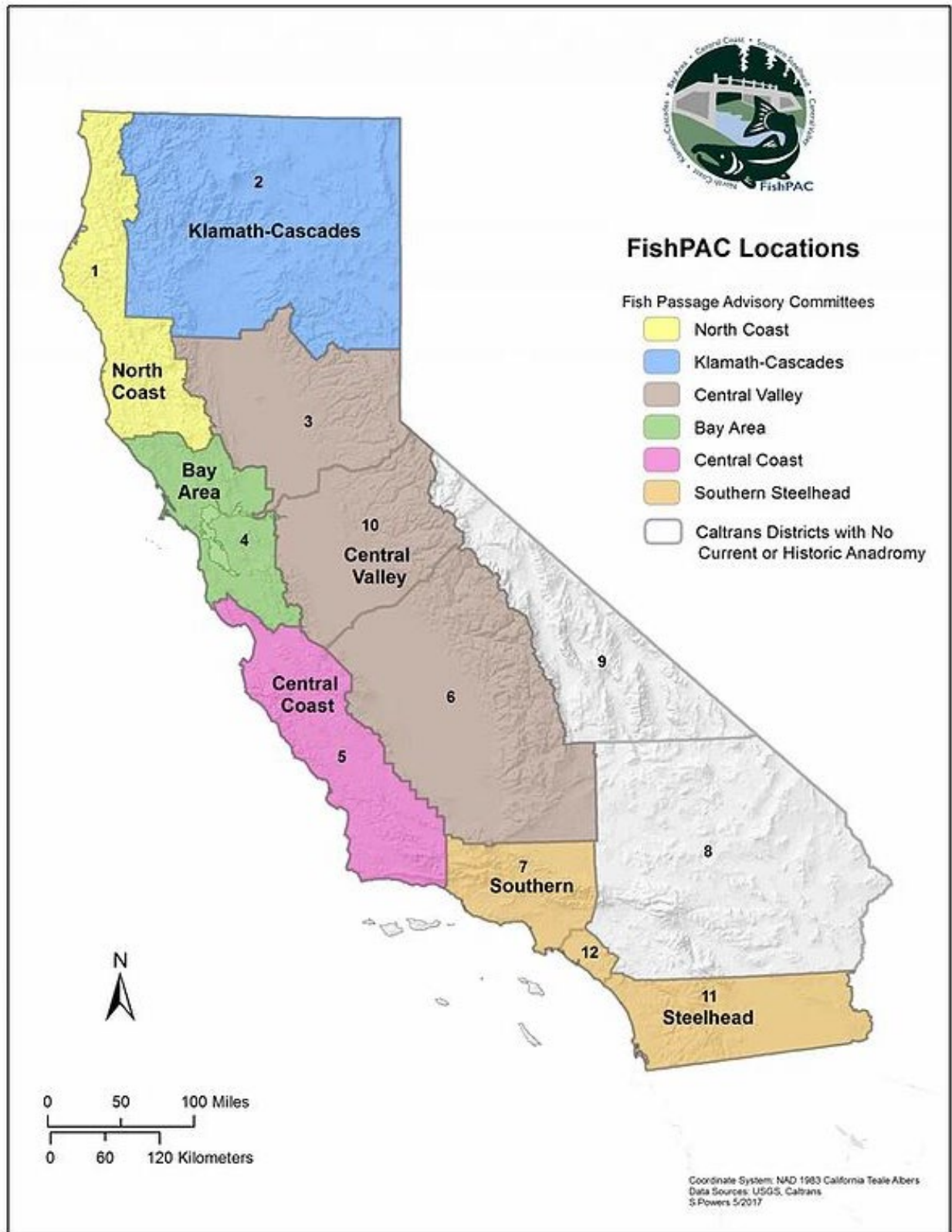
- Three identified species' units currently listed as state and/or federally endangered: central California Coast ESU coho salmon, Sacramento River winter-run ESU Chinook salmon, and southern California DPS steelhead
- Seven identified species currently listed as state and/or federally threatened: Southern Oregon/Northern California ESU coho salmon; Central Valley spring-run ESU and California coastal ESU Chinook salmon; and Central Valley DPS, northern California DPS, central California coast DPS, and south-central California coast DPS steelhead

Figure 2-10 depicts the six California Fish Passage Advisory Committee ("FishPAC") locations throughout the state, including the GAI outlined in red. 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.

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 as well as 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 will help ensure fish populations can respond and adapt to climate change stressors, such as drought, wildfire, sea-level rise, changes in stream flow, and water temperature. The FishPAC network of 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.

Figure 2-10. California Fish Passage Advisory Committee Locations



The FishPAC helps Caltrans advance the desired outcomes of SHC § 156 (J. Walth, Caltrans, personal communication, 2020). Since 2006, in collaboration with FishPAC, statewide, Caltrans has partially or fully remediated 51 barriers on the SHS, and identified 556 additional barriers to salmon and steelhead statewide. Results of Caltrans and FishPAC's efforts to locate, assess, prioritize, and remediate fish passage barriers on the SHS are documented in Fish Passage Annual Reports prepared by Caltrans and submitted to the legislature as required by SHC § 156.1. As specified above, the FishPAC also provides SHS-related information to the Fish Passage Assessment Database, to be incorporated into its periodic updates.³ Information regarding verified SHS fish passage barriers is available through the appropriate FishPAC.

2.10 Sub-basins

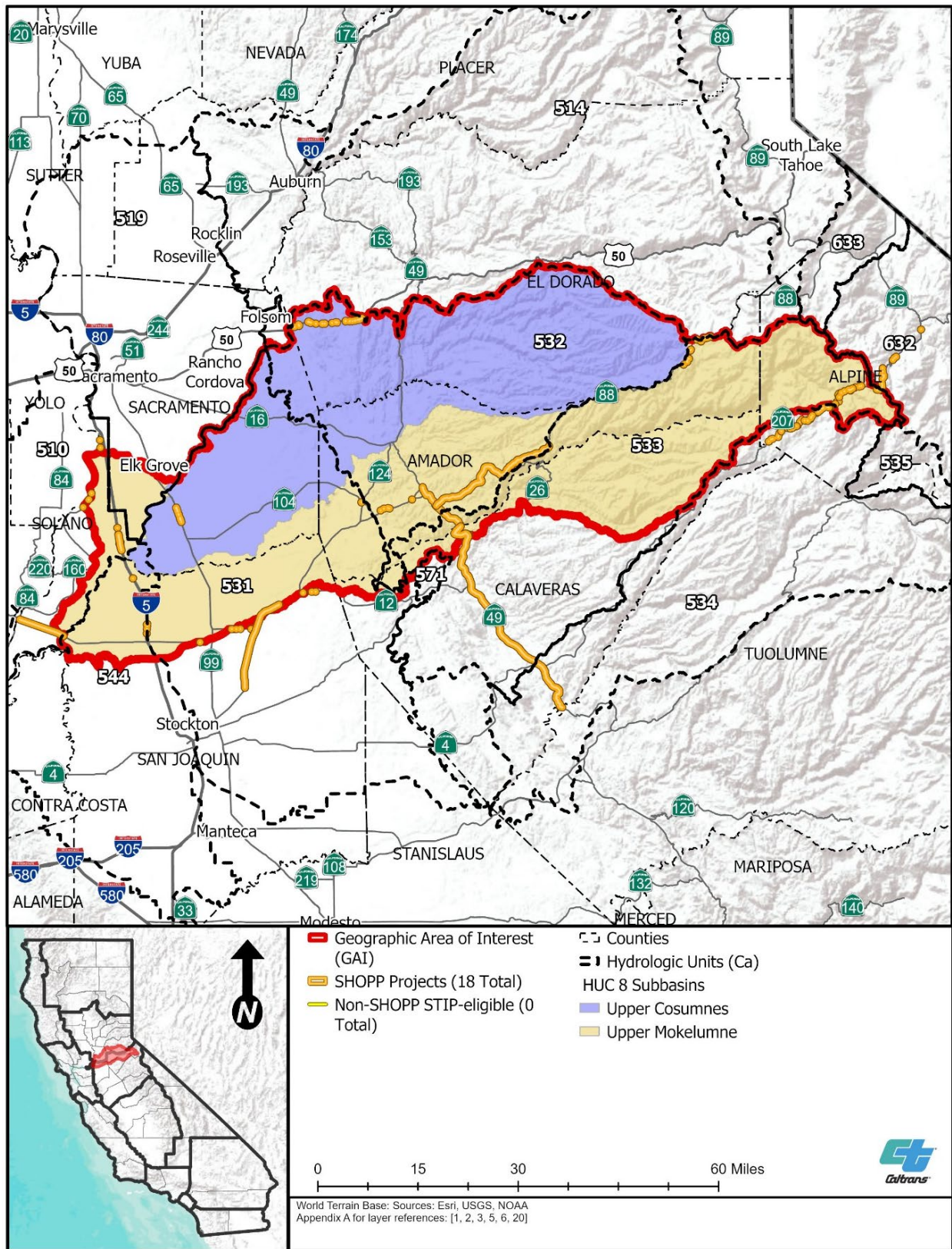
The Watershed Boundary Dataset maps the areal extent of surface water drainage in the U.S. It consists of a hierarchical system of nesting hydrologic units ("HUs") of various scales, each with an assigned HUC that is georeferenced to USGS topographic maps (USGS 2014). Each HUC classification consists of 2 to 12 digits. For example, six-digit HUCs map to the basin level; eight-digit HUCs, or "HUC-8s," map to the sub-basin level; and 12-digit HUCs 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 2024c; USGS 2014). However, the California Department of Water Resources and 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 the Upper Cosumnes and Upper Mokelumne sub-basins, which loosely correspond to 12 HUs (Appendix E). Figure 2-11 shows the overlap between sub-basins and state-level HUs in the GAI.

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

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



2.11 Hydrology

The Upper Cosumnes and Upper Mokelumne sub-basins of the GAI drain an area of 1,418,316 acres (2,216 square miles) (Table 2-4, Figure 2-11). Described individually in Appendix E, these sub-basins include 3,417 rivers and streams that traverse 3,316 miles in the Central Valley RWQCB boundary (Table 2-4). Sub-basin acreages shown in Table 2-4 may include areas outside of the GAI.

Table 2-4. Sub-basins

Sub-basin Name	Sub-basin Code (HUC-8)	Drainage Area (acres) ^a	Rivers and Streams (count)	Total Reach Length (miles) ^a
Upper Cosumnes	18040013	607,874	1,499	1,566
Upper Mokelumne	18040012	810,442	1,918	1,750
Total	Not applicable	1,418,316	3,417	3,316

Source: California Department of Water Resources (2016)

^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 defined as the area of land that is covered by the floodwaters of a 100-year base flood, or a flood having a 1 percent chance of being equaled or exceeded in any given year (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 the Sacramento River, Cosumnes River, Mokelumne River, and Dry Creek. 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 California Regional Water Quality Control Board Central Valley Region, The Sacramento River Basin and The San Joaquin River Basin* (“Basin Plan”; Central Valley RWQCB 2018). 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.

Beneficial uses⁴ for surface water and groundwater are also identified in the Basin Plan (Central Valley RWQCB 2018). 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 2-5).

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 and improved water quality.

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

Table 2-5. Beneficial Uses in the GAI

Beneficial Use	Central Valley Basin Plan	Relevant to RAMNA? ^a
Agricultural supply	Applicable	No
Cold freshwater habitat	Applicable	Yes
Freshwater replenishment	Applicable	Yes
Hydropower generation	Applicable	No
Industrial process supply	Applicable	No
Industrial service supply	Applicable	No
Municipal and domestic supply	Applicable	No
Navigation	Applicable	No
Non-contact water recreation	Applicable	No
Spawning, reproduction, and/or early development	Applicable	Yes
Warm freshwater habitat	Applicable	Yes
Water contact recreation	Applicable	No
Wildlife habitat	Applicable	Yes

Source: Central Valley RWQCB (2018)

^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.

The CWA Section 303(d) list of impaired waters includes 15 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 2-5). 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 2021; Water Education Foundation 2023). 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 Mokelumne River is a state designated wild and scenic river in the GAI (California Department of Water Resources 2020). The location of this state designated wild and scenic river is provided on Figure 2-13. On June 27, 2018, California legislation designated seven segments of the Mokelumne River as a wild and scenic river. The various segments from 0.5 mile downstream of the Salt Springs Dam to the Pardee Reservoir flood surcharge pool, located at an elevation of 580 feet above mean sea level, have been designated as wild, scenic, or recreational (California Department of Water Resources 2020).

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, Water Boards, and/or CDFW regulations, as well as threatened and endangered fish managed by CDFW, FWS, or NMFS. Riparian habitat is discussed separately in Section 2.16.

Corps and EPA jurisdiction under Section 404 of the CWA includes any activity that may cause a discharge of dredged or fill material into waters of the U.S. (“WOTUS”), including wetlands. Corps jurisdiction also includes any work or structure affecting navigable WOTUS, pursuant to Section 10 of the Rivers and Harbors Act and 33 CFR § 329, respectively. The Water Boards’ jurisdiction includes any activity that may cause a discharge of waste to waters of the state (as defined under the Porter-Cologne Water Quality Control Act), including WOTUS such as rivers, streams, and lakes, including ephemeral, intermittent, and perennial watercourses, and wetlands, seeps, and springs. CDFW regulates any activity that may divert or obstruct the natural flow of a river, stream, or lake; change the bed, channel, or bank of any river, stream, or lake; use material from any river, stream, or lake;⁵ and deposit or dispose of material into any river, stream, or lake.

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

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

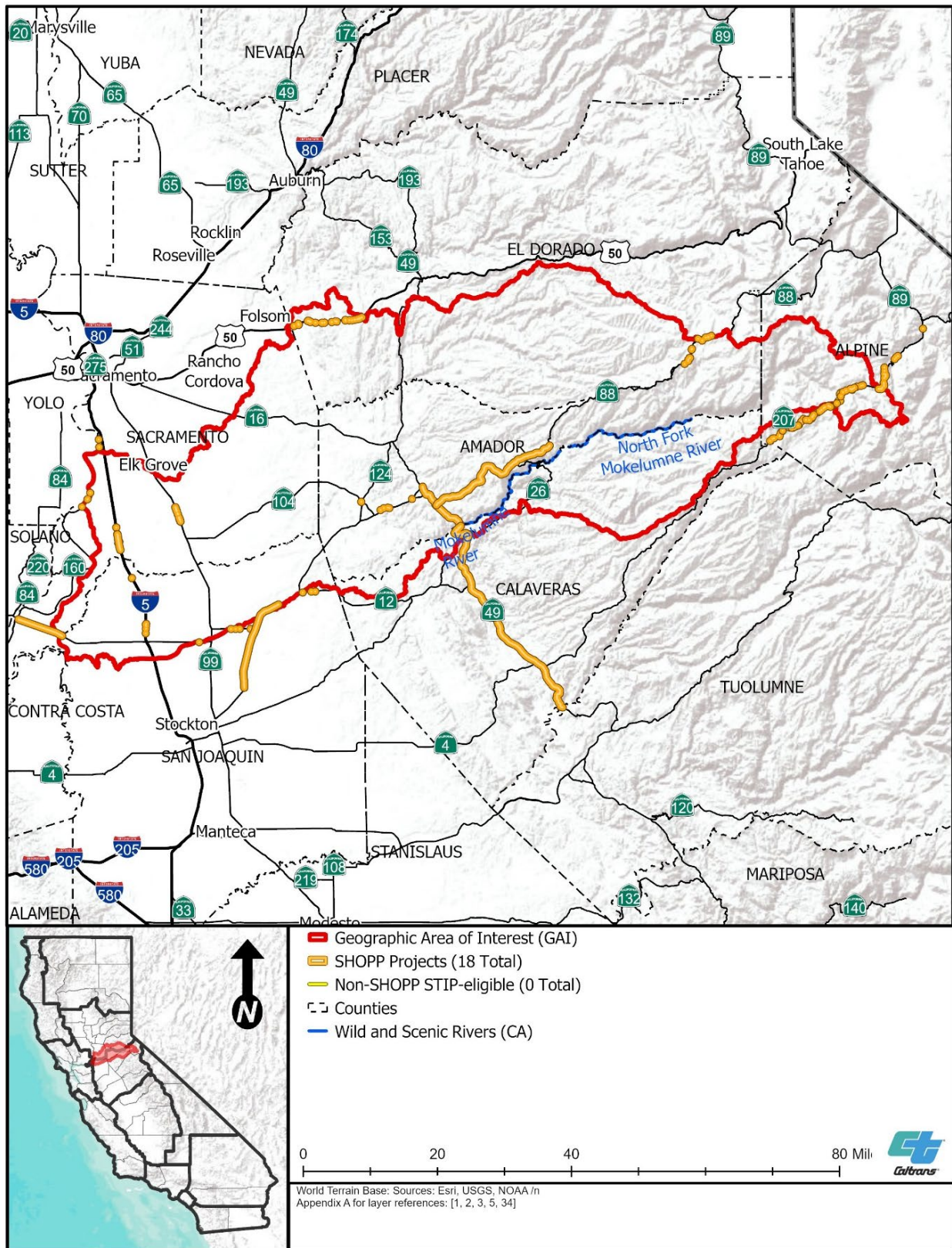
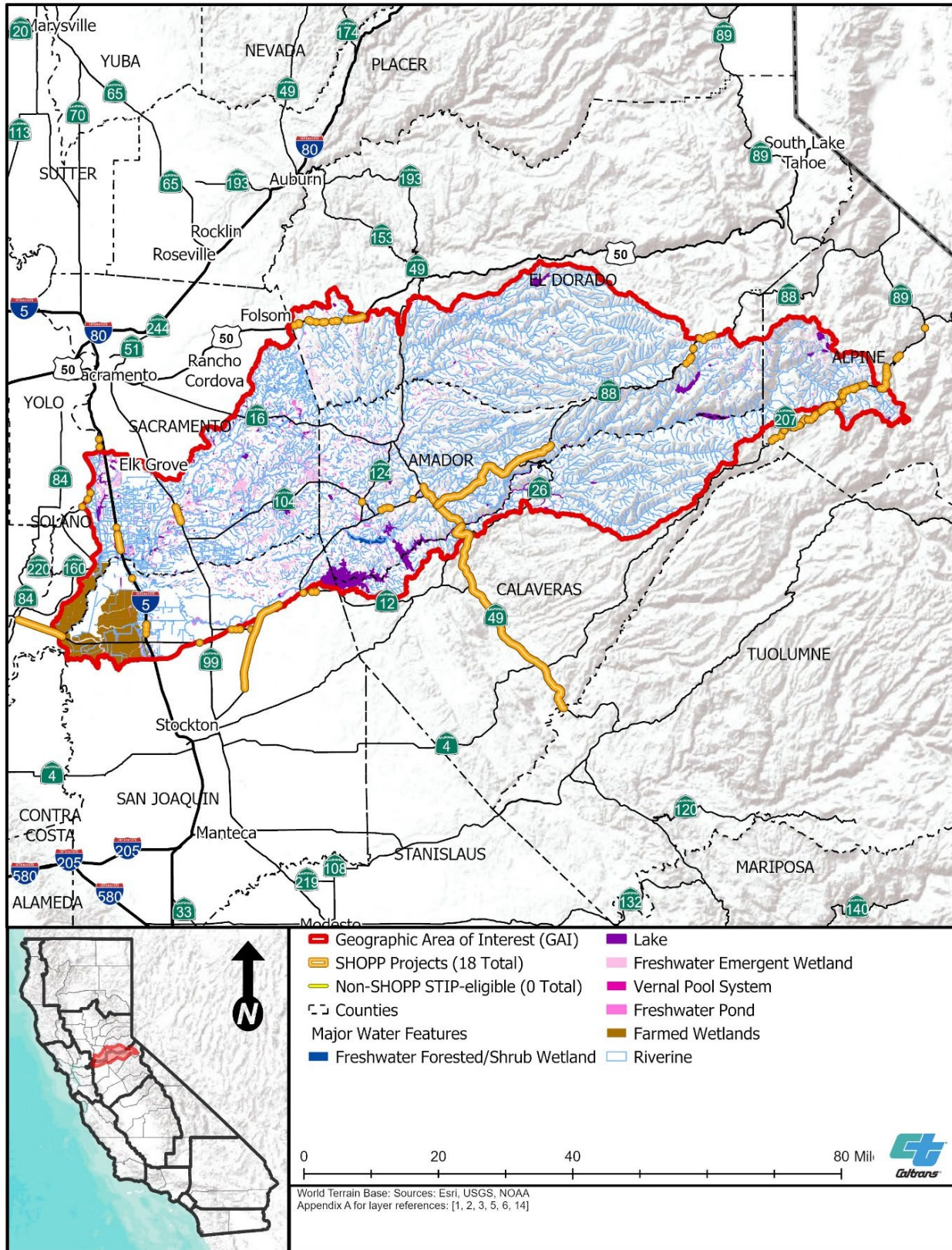


Figure 2-14. Aquatic Resource Features and Major Stream Systems^a



^a For greater detail, see Appendix F.

2.15.1. Historical Context

Historically, Native Americans used major rivers and aquatic features for their abundant resources. As settlers arrived and began development of the Sacramento Valley, the Cosumnes River was not a focal point. However, with the onset of miners through the California Gold Rush, the river was used as a means of transportation and the waters were used for hydraulic mining, altering the river's flow and polluting its waters. After the Gold Rush, the river was altered further with the expansion of irrigation used for agriculture of the surrounding areas (California State Lands Commission 1991). The Mokelumne River was used similarly to the Cosumnes River; however, the Mokelumne River experienced more direct effects as a result of the Gold Rush. The river was used for hydraulic mining that disrupted the natural flows of the river and the surrounding ecology. In addition, the Mokelumne River floodplain was used more for agriculture, and the waters were diverted for irrigation (Calaveras Heritage Council 2006).

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. Threatened and endangered 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, 2024e). Based on a search of the fish habitat layer, seven federally or state-listed threatened or endangered fish species are known to occur or have the potential to occur in the GAI:

- federally and state endangered Sacramento River winter-run ESU Chinook salmon
- federally and state threatened Central Valley spring-run ESU Chinook salmon
- federally threatened and state endangered Delta smelt
- federally threatened southern DPS green sturgeon
- federally threatened Lahontan cutthroat trout
- federally endangered and state threatened longfin smelt
- federally threatened Central Valley DPS steelhead

Of these species, one does not occur in the GAI, Lahontan cutthroat trout (occurs north and east of the GAI) (CDFW n.d.).

Sacramento River winter-run ESU Chinook salmon currently occurs within the Sacramento River (NMFS 2014). Central Valley spring-run ESU Chinook salmon currently occurs within the aquatic resources in the Sacramento Valley and historically was found within the Mokelumne River (NMFS 2014). Delta smelt primarily occurs within the Sacramento-San Joaquin estuary but has the potential to occur within the lower reaches of the Mokelumne River, outside of the GAI (FWS 1996). Southern DPS green sturgeon occurs within the mainstem of the Sacramento River and Sacramento-San Joaquin Delta (NMFS 2021b). Longfin smelt have historically occurred within the Sacramento-San Joaquin estuary (FWS 1996). Central Valley DPS steelhead currently

occurs within the aquatic features in the Sacramento Valley, Cosumnes River, Dry Creek, and lower reaches of the Mokelumne River (NMFS 2014).

Although it is the best information currently available, the SAMNA Reporting Tool's fish species list is uncertain (Caltrans 2024e). 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 require 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 California Aquatic Resource Inventory (2018) (Table 2-6; Appendix G; Caltrans 2024f). 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 Section 404 of the CWA, the Corps considers wetlands to be jurisdictional WOTUS only if they have the three parameters of hydrology, hydrophytic vegetation, and hydric soils, and satisfy criteria to be connected to a traditionally navigable water.

Aquatic resource types outlined here follow the *Classification of Wetlands and Deepwater Habitats of the United States* (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 2-3 may not align with those presented in Table 2-6 (Caltrans 2024f).

Table 2-6. Wetland and Non-wetland Types in the GAI

Type	Upper Cosumnes (acres) 18040013	Upper Mokelumne (acres) 18040012	Total (acres)
Depressional	951.4	1,495.4	2,446.8
Depressional Forested	58.0	121.1	179.1
Depressional Natural	590.5	165.3	755.9
Depressional Non-vegetated	Not mapped	4.8	4.8
Depressional Perennial	Not mapped	6.2	6.2
Depressional Perennial Natural Emergent	Not mapped	<0.1	<0.1
Depressional Perennial Natural Non-vegetated	<0.1	<0.1	<0.1
Depressional Perennial Natural Vegetated	Not mapped	0.3	0.3

Type	Upper Cosumnes (acres) 18040013	Upper Mokelumne (acres) 18040012	Total (acres)
Depressional Perennial Non-vegetated	Not mapped	16.2	16.2
Depressional Perennial Unnatural Emergent	<0.1	0.1	0.1
Depressional Perennial Unnatural Non-vegetated	0.2	0.8	1.1
Depressional Perennial Unnatural Vegetated	<0.1	0.3	0.3
Depressional restoration	468.3	21.5	489.8
Depressional Seasonal	1,594.8	224.5	1,819.2
Depressional Seasonal Natural Emergent	89.7	7.3	97.0
Depressional Seasonal Natural Forested	Not mapped	63.3	63.3
Depressional Seasonal Natural Non-vegetated	Not mapped	<0.1	<0.1
Depressional Seasonal Natural Shrub-Scrub	0.5	5.2	5.7
Depressional Seasonal Unnatural Emergent	<0.1	<0.1	<0.1
Depressional Seasonal Unnatural Non-vegetated	<0.1	<0.1	<0.1
Depressional Seasonal Unnatural Shrub-Scrub	Not mapped	0.6	0.6
Freshwater Emergent Wetland	8,289.5	7,572.9	15,862.4
Freshwater Forested/Shrub Wetland	1,921.0	5,610.4	7,531.4
Freshwater Pond	2,282.0	2,041.2	4,323.2
Individual Vernal Pool	1,891.2	251.1	2,142.3
Lacustrine	171.4	95.9	267.3
Lacustrine Unnatural	9.4	Not mapped	9.4
Lacustrine Unnatural Non-vegetated	Not mapped	<0.1	<0.1
Lake	1,478.2	13,485.9	14,964.1
Other	Not mapped	39,194.1	39,194.1
Riverine	6,183.1	8,027.4	14,210.5
Riverine Tidal Low Gradient	Not mapped	1,659.5	1,659.5
Riverine Unnatural	32.4	Not mapped	32.4
Riverine/Depressional Seasonal	<0.1	<0.1	<0.1
Slope	1.7	0.1	1.8
Total^a	26,013	80,071	106,085

Source: Caltrans (2024f, 2024g)

^a Rounded to the nearest whole number. Numbers may not sum because of rounding.

2.15.4. Vernal Pools

Vernal pools do not have a continuous surface connection to a relatively permanent waterbody 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 California Natural Diversity Database vernal pool invertebrate species occurrences.⁶ Vernal pools mapped using CDFW's ACE vernal pools layer [ds2732] are shown on the left side of Figure 2-15, and the California Natural Diversity Database occurrence of vernal pool invertebrate species and a 4-mile buffer mapped with the SAMNA Reporting Tool are shown on the right side of Figure 2-15.

2.15.5. Non-wetland Waters

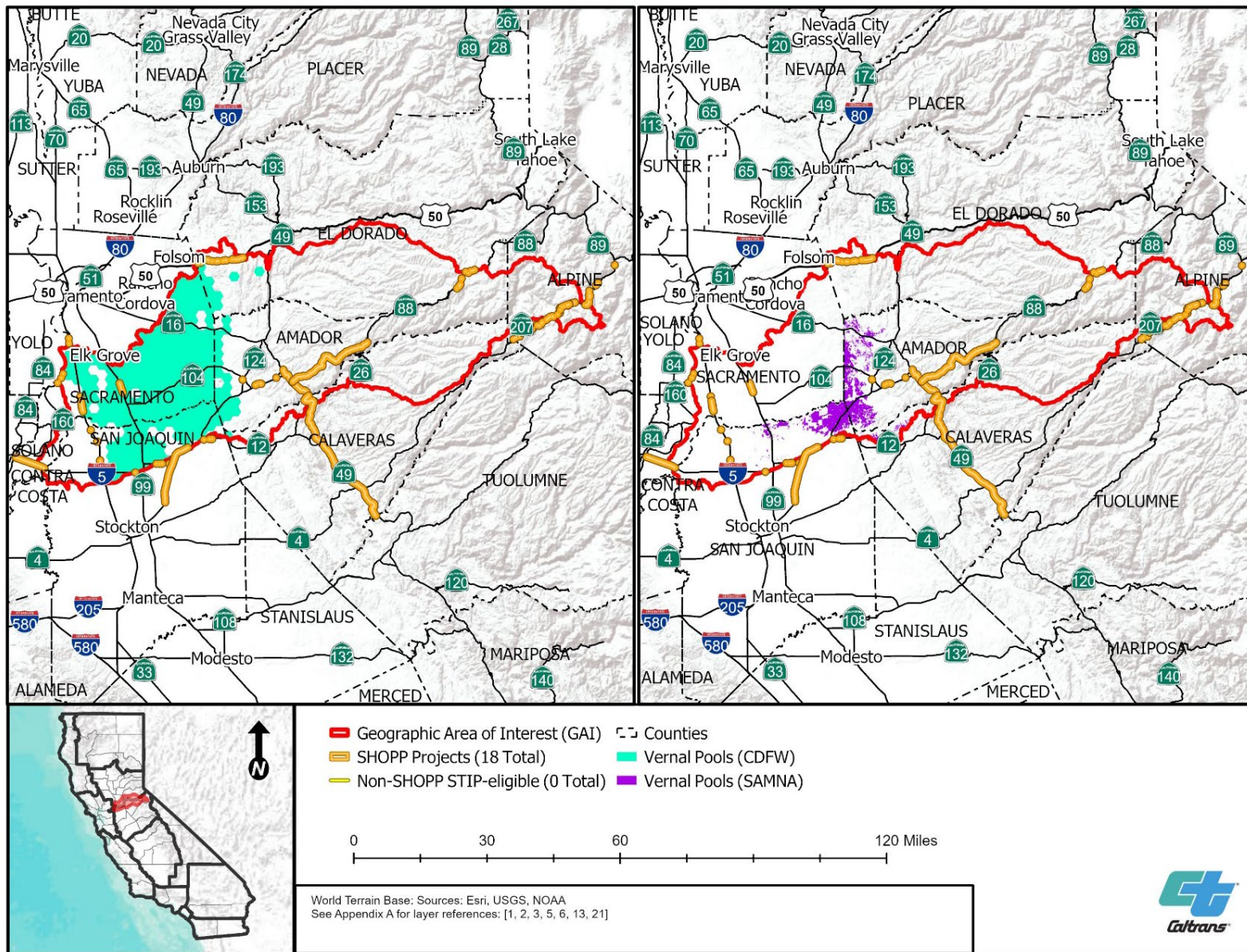
Other, non-wetland water resources information for the GAI was extracted from the SAMNA Reporting Tool, which relies on the USGS National Hydrography Dataset (Table 2-6, Appendix G; Caltrans 2024g). Although suitable for advance mitigation project scoping, site-specific studies that result in more detailed 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 2-3 may not align with those presented in Table 2-6 (Caltrans 2024g).

2.16 Riparian Habitat

Riparian habitats may include portions that are wetlands or non-wetland waters, but they also may be outside of these categories. California does not have a GIS layer for riparian ecotones, and the natural resource regulatory agencies with authority in California do not have a definition for riparian habitat. Riparian areas are water-dependent lands along streams and lakes where transitions occur between terrestrial and aquatic parts of a watershed. As a function of the riparian corridor, riparian area boundaries fluctuate with the flows of their adjacent aquatic feature. Riparian area boundaries are more distinct and separate throughout most of the year, while during periods of high water, topographically lower riparian areas that are typically part of the floodplain become a part of the aquatic feature (Kattlemann and Embury 1996).

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

Figure 2-15. Vernal Pools

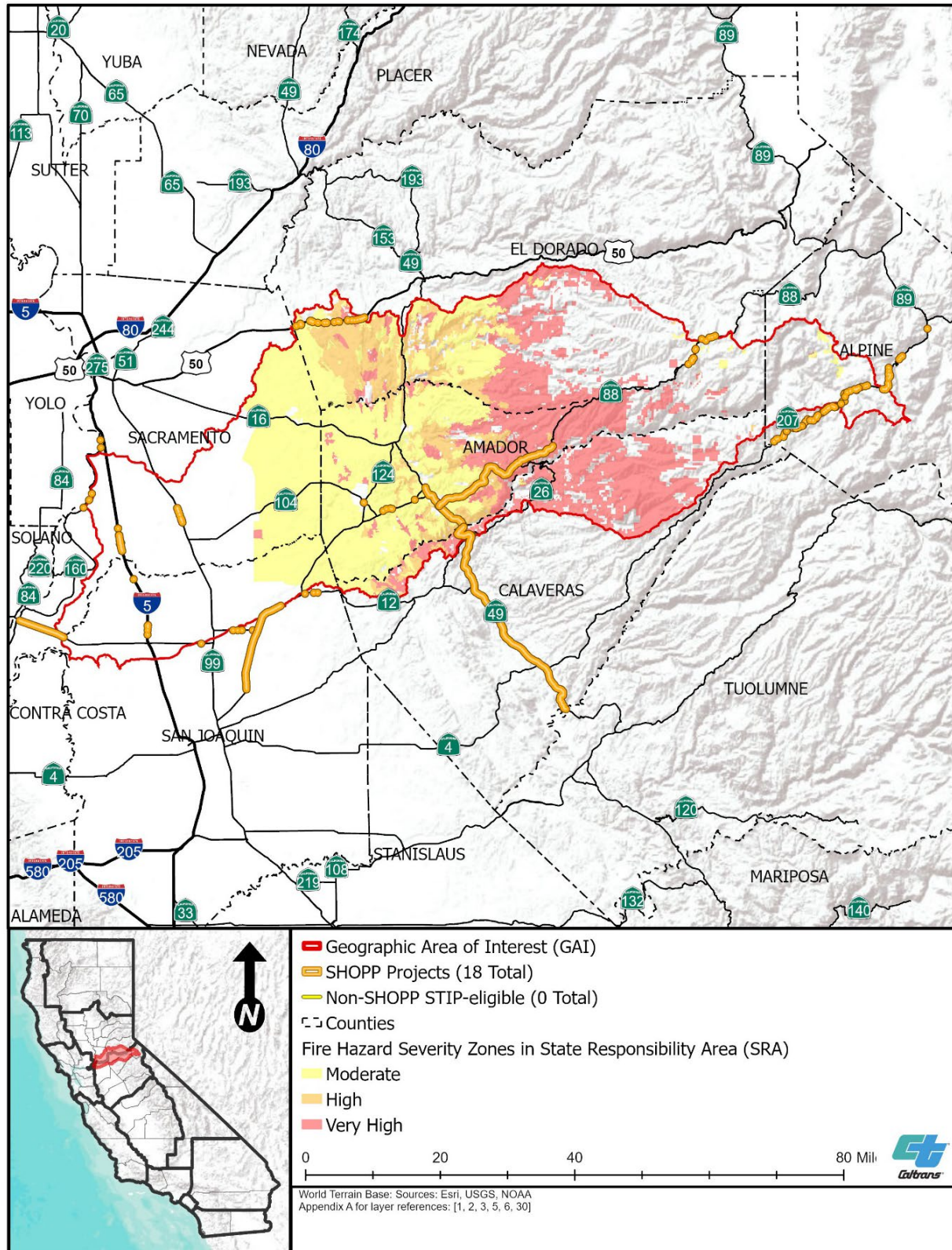


In the GAI, the Sierra Nevada mountain range contains riparian habitat that changes with the elevation and surrounding vegetation communities where there is an obvious contrast between deciduous species in the riparian habitat and the conifers or chaparral on the hillsides. At lower elevations, riparian habitats resemble oasis-like areas in comparison to the surrounding sagebrush and chaparral communities (University of California, Davis, Centers for Wildland Resources 1996). Common riparian vegetation within the Sierra Nevada mountain range may include Fremont cottonwood (*Populus fremontii*), Goodding's black willow (*Salix gooddingii*), quaking aspen (*Populus tremuloides*), black cottonwood (*Populus trichocarpa*), Jeffrey pine (*Pinus jeffreyi*), other willow species (*Salix* sp.), alder species (*Alnus* sp.), and dogwood species (*Cornus* sp.) (Davis and Stoms 1996). The SAMNA's vegetation layer identifies montane riparian habitat and valley foothill riparian habitat in the GAI (Table 2-3). The riparian landcover dataset, briefly described in Section 1.4.1, predicts areas of potential riparian function in the GAI; however, results are not ground-truthed.

2.17 Fire Hazard Severity Zones

The California Department of Forestry and Fire Protection prepares Fire Hazard Severity Zone maps that classify the severity of fire hazards in California (Figure 2-16). These maps are developed by assigning a hazard score based on factors that influence fire likelihood and behavior, including fire history, existing and potential fuel, predicted flame length, blowing embers, terrain, and typical fire weather. Hazard scores are averaged over zone areas to result in a moderate, high, or very high zone class. As indicated on Figure 2-16, moderate severity zones are concentrated central portion of the GAI with high and very high zones concentrated immediately to the east within the Sierra Nevada. This information is important for scoping advance mitigation projects 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



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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 project scopes informed by this RAMNA. The table is organized by subject: laws and regulations, statewide and regional resource management plans, plans and permits focused on the species of mitigation need, resource agency land management plans (separated by agency), water resources plans and documents, county and city general plans, and other organization conservation and management documents. HCPs, NCCPs, and RCIS documents are discussed separately in Chapter 4, *Existing Mitigation Opportunities*, because they represent or support current compensatory mitigation credit purchase opportunities for Caltrans. Table 3-1 provides the following information for each reference identified:

- reference document title
- status:
 - final: 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 – a summary of information relevant to advance mitigation planning and/or a summary of reference intent
- link – where the reference can be found
- date – when the reference was published or last updated

The list of relevant documents, policies, and regulations in Table 3-1 is not exhaustive. Caltrans may consult additional relevant resources 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 stated in Chapter 1, *Introduction*, the GAI for this RAMNA was selected by Caltrans District 3 based on the SAMNA results and other information. Caltrans District 3 specifically identified compensatory mitigation for the California red-legged frog, foothill yellow-legged frog, giant garter snake, Swainson's hawk, valley elderberry longhorn beetle, Central Valley spring-run and Sacramento River winter-run ESUs of Chinook salmon, delta smelt, southern DPS green sturgeon, longfin smelt, Central Valley DPS steelhead, aquatic resources, and 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, and 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)
Barriers to Fish Passage SHC § 156	Final	No	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 new construction or continued maintenance upgrades of SHS facilities to prevent or impede the passage of salmon and steelhead, the majority of which are listed as either threatened or endangered in California, and requires Caltrans to do the following: ▪ Provide an annual list of fish passage priorities for the SHS to the legislature. ▪ Complete assessments of potential barriers to anadromous fish prior to commencing any transportation project using state or federal transportation funds. ▪ Submit assessments to the Fish Passage Assessment Database. ▪ Construct all new transportation projects in a way that does not pose or create a barrier to fish passage. Caltrans collaborates with the FishPAC to identify passage priority locations for the SHS. The FishPAC is a partnership between CDFW, NMFS, FWS, CCC, CalTrout, Pacific States Marine Fisheries Commission, other local fish passage advocates, and Caltrans.	https://leginfo.legislature.ca.gov/faces/codes_displaySection.xhtml?sectionNum=156.&lawCode=SHC	1/1/2006 (effective date)
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
2021 Fish Passage Annual Legislative Report	Updated periodically	No	This report identifies priority fish passage barriers on the SHS. Priorities are determined through FishPAC collaboration and are based on: ▪ species diversity – listed threatened and endangered salmon and steelhead species currently or historically present in the watershed; ▪ habitat – suitable habitat quality and quantity above each crossing, relative to recovery of threatened and endangered species; and ▪ best professional knowledge – professional, discretionary value for science-based information known to fisheries and engineering subject matter experts. Subject matter experts include CDFW, NMFS, FWS, CCC, CalTrout, Pacific States Marine Fisheries Commission, other local fish passage advocates, and Caltrans.	https://dot.ca.gov/-/media/dot-media/programs/legislative-affairs/documents/fish-passage-report-2021-final_a11y.pdf	10/1/2022 (most recent)

Title	Status	Spatial Data	Reference Purpose	Link	Date
CESA	Updated periodically (by California legislature)	No	CESA prohibits the take of any species of wildlife designated by the California Fish and Game Commission as an endangered, threatened, or candidate species. CDFW may authorize the take of any such species by permit if the conditions set forth in FGC § 2081, subdivisions (b) and (c), are met (see California Code of Regulations, Title 14, § 783.4).	https://www.wildlife.ca.gov/Conservation/CESA	9/10/2018 (last amended)
Executive Order W-59-93	Final	No	Governor of California's directive for a no net loss policy on the quantity, quality, and permanence of wetland acreages and values.	https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/wrapp2008/executive_order_w59_93.pdf	8/23/1993
Native Plant Protection Act	Final	No	Enacted in 1977, the Act allows the California Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the Native Plant Protection Act. The Act prohibits take of endangered or rare native plants, but includes some exceptions for agricultural and nursery operations and emergencies, and after properly notifying CDFW for vegetation removal from canals, roads, and other sites; changes in land use; and in certain other situations.	https://leginfo.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	This law 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	1/1/2023 (last amended)
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	Final	No	Implemented by the SWRCB. Creates a State of California wetland definition, a framework for determining jurisdiction of state wetlands, wetland delineation procedures, and application procedures for discharges of dredge and fill material to waters of the state.	https://www.waterboards.ca.gov/water_issues/programs/cwa401/wrapp.html	5/28/2020 (effective date)
Lake and Streambed Alteration Program FGC § 1602	Updated periodically (by California legislature)	No	Implemented by CDFW. Regulates activities that may substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. CDFW jurisdiction extends to top-of-bank of the outer extent of riparian habitat, if present.	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	2/1/2010 (last revision)
Federal Laws, Guidelines, and Regulations	See below	See below	See below	See below	See below
2008 Final Compensatory Mitigation Rule	Final	No	Corps' ruling to establish standards and criteria for the use of all types of compensatory mitigation, including on- and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts on WOTUS.	https://www.govinfo.gov/content/pkg/CFR-2012-title33-vol3/xml/CFR-2012-title33-vol3-part332.xml	7/9/2008

Title	Status	Spatial Data	Reference Purpose	Link	Date
12501-SPD Regulatory Program Standard Operating Procedure for Determination of Mitigation Ratios	Final	No	This informational public notice announces updates to a procedure for determining compensatory mitigation requirements as required for processing of Department of the Army 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/	8/5/2013
303(d) List of Impaired Water Bodies	Updated periodically	No	EPA and the SWRCB's listing of regulated impaired waterbodies.	https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2024-integrated-report.html	2/6/2024 (last updated)
40 CFR § 131.12 California Antidegradation Policy	Final	No	Implemented by the 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/collec tion/p16021coll9/id/1473	9/25/2018
Current Implementation of Waters of the United States	Updated periodically	No	This is EPA's website on the implementation and definition of WOTUS, based on the most current agency rulemaking and legal decisions.	https://www.epa.gov/wotus/current-implementation-waters-united-states	10/10/2023 (last updated as currently proposed)
CWA § 1344	Updated periodically (by Congress)	No	Authorized by EPA and delegated to the Corps and the SWRCB, the CWA establishes the basic structure for regulating discharges of pollutants into WOTUS and regulating quality standards for surface waters.	https://www.law.cornell.edu/uscode/text/33/1344	2/4/1987 (last amended)
CWA § 1341	Updated periodically (by Congress)	No	Implemented by EPA and SWRCB. Regulates discharge of pollutants into WOTUS.	https://www.law.cornell.edu/uscode/text/33/1341	12/27/1977 (last amended)
CWA § 402 National Pollutant Discharge Elimination System MS4 Permit	Updated periodically (by Congress)	No	Implemented by EPA and SWRCB, this permit regulates discharge of stormwater from municipal sources that are a conveyance or system of conveyances and are: - owned by a state, city, town, village, or other public entity that discharges to WOTUS; - designed or used to collect or convey stormwater (for example, storm drains, pipes, ditches); - not a combined sewer; and - not part of a sewage treatment plant or publicly owned treatment works.	https://www.epa.gov/npdes/stormwater-discharges-municipal-sources	1/19/2019 (last amended)
CWA § 404	Updated periodically (by Congress)	No	Implemented by EPA and the Corps. Regulates discharge of dredge or fill material into WOTUS.	https://www.epa.gov/cwa-404/section-404-permit-program	2/17/2026 (last amended)
Definition of "Waters of the United States"	Updated periodically	No	On November 17, 2025, the EPA and Department of the Army announced the proposed rule "Updated Definition of Waters of the United States". This proposal implements the U.S. Supreme Court's May 25, 2023, decision in the case of <i>Sackett v. Environmental Protection Agency</i> .	https://www.epa.gov/wotus/revising-definition-waters-united-states	11/17/2025 (last amended)
Executive Order 11990, Protection of Wetlands	Final	No	Aims to minimize the destruction, loss, or degradation of wetlands, and to preserve and enhance the natural and beneficial values of wetlands.	https://www.epa.gov/cwa-404/protection-wetlands-executive-order-11990	5/24/1977
FESA	Updated periodically (by Congress)	No	This Act authorizes FWS and NMFS to protect federally listed threatened and endangered species.	https://www.fws.gov/endangered/laws-policies/	11/24/2003 (last amended)
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	1/12/2015 (last amended)

Title	Status	Spatial Data	Reference Purpose	Link	Date
FWS Mitigation Policy	Final	No	FWS' policy builds upon the guidance in the 1981 Mitigation Policy for FWS recommendations and requirements for mitigating adverse impacts of land and water developments on fish and wildlife.	https://www.fws.gov/policy-library/A1501fw2	2/13/2026 (last amended)
FWS Endangered Species Act Compensatory Mitigation Policy	Final	No	FWS' policy adopts mitigation principles established in the FWS Mitigation Policy, establishes compensatory mitigation standards, and provides guidance for the application of compensatory mitigation through implementation of the FESA.	https://www.fws.gov/policy-library/a1501fw3	2/13/2026 (last amended)
National Wetlands Mitigation Action Plan	Final	No	EPA and the Corps comprehensive, interagency document to further achievement of the goal of no net loss of wetlands and to set forth the no net loss policy.	https://www.epa.gov/cwa-404/national-wetlands-mitigation-action-plan	12/26/2002
NOAA Mitigation Policy for Trust Resources	Final	No	NOAA's comprehensive national policy on mitigation outlines principles it will use to guide decisions about mitigation as it implements its programs and assists public agencies, tribes, and project proponents to avoid, minimize, and compensate for adverse impacts on natural resources under NOAA management or jurisdiction.	https://www.noaa.gov/organization/administration/noaa-administrative-orders-chapter-216-program-management/nao-216-123-noaa-mitigation-policy-for-trust-resources	7/22/2022
Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change	Updated periodically	No	FWS' document 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://digitalmedia.fws.gov/digital/collection/document/id/1783/	9/1/2010
Section 10 of the Rivers and Harbors Appropriation Act of 1899	Updated periodically (by Congress)	No	Authorizes the Corps to protect navigable WOTUS by requiring a permit for construction of any structure over a navigable WOTUS. A Section 10 permit is required if the structure or work affects the course, location, or condition of the 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)
Section 14 of the Rivers and Harbors Appropriation Act of 1899	Updated periodically (by Congress)	No	This Act is also known as 33 USC Section 408 or, more simply, Section 408. Implemented by the Corps, this Act regulates the temporary or permanent occupation, use, or alteration of any sea wall, bulkhead, jetty, dike, levee, wharf, pier, or other work built by the U.S. Section 408 permission may be granted when the proposed activity is not injurious to the public interest and does not impair the usefulness of the federal project.	https://www.law.cornell.edu/uscode/text/33/408	1/4/2025 (last amended)
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
State Board Resolution No. 68-16	Final	No	This resolution provides the policy for maintaining high water quality.	https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf	10/28/1968
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)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Statewide and Regional Resource Planning Documents	See below	See below	See below	See below	See below
2018 Master Plan for Fisheries	Final	No	CDFW's plan implements the Marine Life Management Act. It includes goals to manage priority species, achieve sustainability for commercial fish stocks, conserve ecosystems, integrate marine protected areas into fisheries management, and provide adaptive management for climate change. It provides a framework for specific management plan creation.	https://wildlife.ca.gov/Conservation/Marine/Master-Plan	6/1/2018
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	California Governor's Office's planning report, which 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	CDFW's 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	12/18/2025 (last updated)
California Biodiversity Initiative	Final	No	CNRA, California Department of Food and Agriculture, and Governor's Office of Planning and Research's 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	Final	Yes	CDFW and Caltrans' assessment to identify large remaining blocks of intact habitat or natural landscape and model linkages between them that need to be maintained, particularly as corridors for wildlife.	https://data-cdfw.opendata.arcgis.com/datasets/CDFW::natural-areas-small-california-essential-habitat-connectivity-cehc-ds1073/about	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
Caltrans Adaptation Priorities Report: District 3	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/d3-adaptation-priorities-report-2020-a11y.pdf	12/1/2020
Caltrans Climate Change Vulnerability Assessment, District 3 Technical Report	Final	No	Caltrans' assessment of climate change vulnerabilities for Caltrans District 3.	https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/2019-climate-change-vulnerability-assessments/ada-remediated/d3-technical-report-a11y.pdf	10/1/2019
Delta Adapts: Creating a Climate Resilient Future	Draft	Yes	Delta Stewardship Council's draft plan for climate change adaptation in the Bay-Delta, including strategies related to flood risk reduction, ecosystem protection and enhancement, agricultural preservation, and water supply reliability.	https://www.deltacouncil.ca.gov/pdf/delta-plan/2024-11-18-delta-adapts-draft-adaptation-plan.pdf	11/18/24
The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value	Final	Yes	Delta Stewardship Council's plan for managing the Bay-Delta's water and environmental resources, providing policies and recommendations pertaining to water supply; ecosystem restoration; protection and enhancement of cultural, recreational, natural resource, and agricultural values; water quality; and risk reduction related to flooding, earthquakes, and land subsidence.	https://www.deltacouncil.ca.gov/delta-plan/	1/31/24 (last amended)

Title	Status	Spatial Data	Reference Purpose	Link	Date
From Wildlife-Vehicle Conflict to Solutions for California Wildlife & Drivers	Final	Yes	University of California, Davis's Road Ecology Center's report on the ecological and financial cost of vehicle collisions with wildlife throughout the state, broken down by different regions in the state.	https://roadeecology.ucdavis.edu/resource-type/report	6/15/2024
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
Regional Conservation Investment Strategies	Updated periodically	Yes	CDFW's central location for RCISs that are approved, in draft review, or in development in California. No RCISs occur in the GAI.	https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation/RCIS	4/1/2024 (most recent document)
Restoring California's Wildlife Connectivity 2022: 2022 Priority Wildlife Connectivity Project Locations by Region	Final	Yes	Provides CDFW's priority wildlife movement barriers across the state. This document is focused on large wild mammal game species; however, some priorities would benefit special-status species such as bighorn sheep.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=204648&inline	12/1/2022
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
Sierra Nevada Conservancy 2024–2029 Strategic Plan	Final	No	Sierra Nevada Conservancy's 5-year strategic plan for internal guidance of goals and objectives within the Sierra-Cascade region. Includes goals to restore aquatic systems and meadows, connect migration corridors for climate-vulnerable species, conserve significant carbon stores, improve ecological processes and functions, and develop forest-health and wildfire-resilience projects.	https://sierranevada.ca.gov/about-us/	6/6/2024
SWAP	Updated periodically (5-year intervals)	Yes	CDFW's plan for protection of species of greatest conservation need, in addition to habitats and other wildlife in California.	https://swap.wildlife.ca.gov/	10/1/2025 (last updated)
SWAP Transportation Companion Plan	Final	Yes	CDFW's companion document to SWAP for protection of species specific to transportation project planning.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=136128&inline	12/1/2016
SWAP Water Management Companion Plan	Final	Yes	CDFW's companion document to SWAP to recommend water management practices throughout the state of California.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=229412&inline	10/1/2025

Title	Status	Spatial Data	Reference Purpose	Link	Date
Special-Status Taxa^a Documents	See below	See below	See below	See below	See below
Recovery Plan for the California Red-legged Frog	Final	Yes	FWS' recovery plan for California red-legged frog. The recovery criteria that must be achieved before delisting can occur are: ▪ All suitable habitats in Core Areas (4 out of 35 of which 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	Not available	FWS has not completed a formal 5-year review of this species.	https://ecos.fws.gov/ecp/species/2891	Not available
California Red-legged Frog Designation of Critical Habitat	Final	Yes	FWS' designation of critical habitat for the California red-legged frog.	https://www.govinfo.gov/content/pkg/FR-2010-03-17/pdf/2010-4656.pdf#page=2	3/17/2010
California Red-legged Frog Biological Opinions	Updated periodically	No	FWS' list of the 231 most recent biological opinions that have been used for California red-legged frog, of which 11 were for projects in the GAI.	https://ecos.fws.gov/ecp/species/2891	9/15/2020 (latest document)
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: ▪ Research DPS needs and habitat use to fill knowledge gaps ▪ Enhance occupied habitat to increase abundance and connectivity ▪ 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
Foothill yellow-legged frog Designation of Critical Habitat	Not available	Not available	FWS has not designated critical habitat for foothill yellow-legged frog.	https://ecos.fws.gov/ecp/species/5133	Not available
Foothill yellow-legged frog Biological Opinions	Updated periodically	No	FWS' list of 17 biological opinions that have been issued for the foothill yellow-legged frog; of these, 5 were for projects in the GAI.	https://ecos.fws.gov/ecp/species/5133#bo	7/20/2023 (latest document)
Report to the Fish and Game Commission. A Status Review of the Foothill Yellow-Legged Frog (<i>Rana boylei</i>) in California	Final	Yes	CDFW's report to the California Fish and Game Commission on the status of foothill yellow-legged frog for consideration in determining whether to list any clade of the species under the CESA.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=174663&inline	9/20/2019 (latest document)
California Fish and Game Commission Notice of Findings for Foothill Yellow-Legged Frog (<i>Rana boylei</i>)	Final	No	California Fish and Game Commissions' notice formally listing five clades of foothill yellow-legged frog under the CESA.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=177905&inline	3/10/2020
Considerations for Conserving the Foothill Yellow-Legged Frog	Final	No	CDFW's document reviewing foothill yellow-legged frog and ways to avoid and/or minimize project impacts.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=157562&inline	5/14/2018

Title	Status	Spatial Data	Reference Purpose	Link	Date
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. There are 12 documents in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	6/5/2024 (latest document)
Recovery Plan for the Giant Garter Snake	Final	Yes	FWS' recovery plan for giant garter snake. The following recovery units occur in the GAI: Butte Basin, Colusa Basin, Sutter Basin, American Basin, Yolo Basin, Cosumnes-Mokelumne Basin, and Delta Basin. Includes the following requirements for delisting: - Have protected habitat at specific and general locations and acreage amounts detailed in Section D.1.A of the plan. Specific locations in the plan include Little Chico Creek, Butte Creek, Cherokee Canal, Glenn Colusa Canal, Ridge Cut Slough, Sutter Bypass, Tisdale Bypass, and Yolo Bypass. - Eradicate or significantly reduce nonnative water snakes (<i>Nerodia</i> sp.), largemouth bass (<i>Micropterus salmoides</i>), catfish, crayfish, and nonnative bullfrogs throughout the historical range of the giant garter snake.	https://ecos.fws.gov/ecp/species/4482	9/28/2017
Giant Garter Snake 5-Year Review	Periodically updated	Yes	FWS' most recent 5-year review of this species.	https://ecos.fws.gov/ecp/species/4482	6/10/2020 (last updated)
Giant Garter Snake Designation of Critical Habitat	Not applicable	No	Critical habitat has not been designated for this species.	https://ecos.fws.gov/ecp/species/4482	Not applicable
Giant Garter Snake Biological Opinions	Periodically updated	No	FWS' list of the 112 most recent biological opinions that have been used for giant garter snake, of which 41 were for projects in the GAI.	https://ecos.fws.gov/ecp/species/4482	8/22/2024 (latest document)
Programmatic Consultation with the U.S. Army Corps of Engineers 404 Permitted Projects with Relatively Small Effects on the Giant Garter Snake within Butte, Colusa, Glenn, Fresno, Merced, Sacramento, San Joaquin, Solano, Stanislaus, Sutter and Yolo Counties, California, Appendix A, Guidelines for Restoration and/or Replacement of Giant Garter Snake Habitat	Final	No	FWS' guidelines for restoration and replacement of habitat for giant garter snake.	https://www.fws.gov/sacramento/es/Survey-Protocols-Guidelines/Documents/ggs%20appendix%20a.pdf	Unknown (document has no date and parent link is undated)
California Wildlife Habitat Relationships System, Giant Garter Snake	Periodically updated	No	CDFW's formal summary of ecological and biological information about the giant garter snake.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3457&inline=1	11/1/2014 (last updated)
Incidental Take Permits for Giant Garter Snake	Periodically updated	No	CDFW's list of incidental take permits issued for the giant garter snake from its publicly available document search website. There are 46 documents in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	9/25/2024 (latest document)
Status Review: Swainson's Hawk (<i>Buteo swainsoni</i>) in California	Periodically updated	No	CDFW's most recent status review of Swainson's hawk.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=133622&inline	4/11/2016
Staff Report Regarding Mitigation for Impacts to Swainson's Hawks (<i>Buteo swainsoni</i>) in the Central Vally of California	Final	No	CDFW's report on mitigation strategies and options for Swainson's hawk.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=83992&inline	11/8/1994
Incidental Take Permits for Swainson's Hawk	Periodically updated	No	CDFW's list of incidental take permits issued for the Swainson's hawk from its publicly available document search website. There are 71 documents in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	10/4/2024 (latest document)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Recovery Plan for the Valley Elderberry Longhorn Beetle	Final	Yes	FWS' recovery plan for valley elderberry longhorn beetle. All three management units for the valley elderberry longhorn beetle occur in the GAI, and all of the HUC-8s of the GAI are included in a management unit of the plan. Includes the following requirements for delisting: ▪ Maintain occupancy in at least 80% of the HUC-8s that occur in the management units. ▪ Protect and manage a system of connected habitat patches along each river or major drainage in each HUC-8, at least two of which need to show long-term population viability and be able to survive precipitation extremes. The number and location of patches are detailed in Table 1 of the document. ▪ Control or eradicate Argentine ants in each mitigation bank that supports valley elderberry longhorn beetle.	https://ecos.fws.gov/ecp/species/7850	10/4/2019 (recently revised)
Valley Elderberry Longhorn Beetle 5-Year Review	Periodically updated	Yes	FWS' most recent 5-year review of this species.	https://ecos.fws.gov/ecp/species/7850	9/26/2023
Valley Elderberry Longhorn Beetle Designation of Critical Habitat	Final	Yes	FWS' document describing critical habitat for this species.	https://ecos.fws.gov/ecp/species/7850	8/8/1980
Valley Elderberry Longhorn Beetle Biological Opinions	Periodically updated	No	FWS' list of the 116 most recent biological opinions that have been used for valley elderberry longhorn beetle, of which 57 were for projects in the GAI.	https://ecos.fws.gov/ecp/species/7850	11/4/2024 (latest document)
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	Final	Yes	NMFS' recovery plan for the Sacramento River winter-run and Central Valley spring-run ESUs of Chinook salmon. The recovery criteria that must be achieved before delisting can occur are based on a complex formula of population levels in different diversity groups that are 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 Spring-run ESU Chinook Salmon 5-Year Review	Updated periodically	Yes	NMFS' most recent formal review of the species' ESU condition.	https://www.fisheries.noaa.gov/resource/document/5-year-review-summary-and-evaluation-central-valley-spring-run-chinook-salmon	4/13/2016
Critical Habitat Designation for Central Valley Spring-run ESU Chinook Salmon	Final	No	NMFS' designation of critical habitat for this ESU of Chinook salmon.	https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/central-valley-spring-run-chinook-salmon	9/2/2005
A Status Review of the Spring-Run Chinook Salmon (<i>Oncorhynchus tshawytscha</i>) in the Sacramento River Drainage	Final	No	CDFW's formal review of the species' ESU condition.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=3518&inline	6/1/1998
5-Year Status Review: Summary and Evaluation of Sacramento River Winter-run Chinook Salmon ESU	Updated periodically	Yes	NMFS' most recent formal review of the species' ESU condition.	https://www.fisheries.noaa.gov/resource/document/5-year-status-review-summary-and-evaluation-sacramento-river-winter-run-chinook	12/12/2016
Critical Habitat Designation for Sacramento River Winter-run ESU	Final	No	NMFS' designation of critical habitat for this ESU of Chinook salmon.	https://www.fisheries.noaa.gov/west-coast/endangered-species-conservation/sacramento-river-winter-run-chinook-salmon	6/16/1993
Chinook Salmon Biological Opinions	Updated periodically	No	A total of 126 biological opinions have been issued for Chinook salmon since 2016. Twenty-seven of these have been issued for a project in the GAI.	https://repository.library.noaa.gov/	5/17/2021 (latest document)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Incidental Take Permits for Chinook Salmon	Updated periodically	No	This is CDFW's list of incidental take permits issued for the chinook salmon from its publicly available document search website. There are 60 documents in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	11/27/2024 (latest document)
Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes	Final	Yes	FWS' recovery plan for Delta smelt. The recovery criteria that must be achieved before delisting can occur are: - Delta smelt caught in all recovery zones for 2 out of 5 years, in at least two zones in one of the remaining 3 years, and at least one zone for the remaining 2 years. - Delta smelt numbers of total catch must equal or exceed 239 for 2 out of 5 years, and not fall below 84 for more than 2 years in a row. - These criteria can be achieved independently but must be based on data collected by CDFW during the Fall Midwater Trawl Survey in September and October.	https://ecos.fws.gov/ecp/species/321	11/26/1996
Delta Smelt 5-Year Review	Updated periodically	No	FWS' most recent formal review of the species condition.	https://ecos.fws.gov/ecp/species/321	9/13/2010
Critical Habitat Designation for Delta Smelt	Final	Yes	FWS' designation of critical habitat for this species.	https://ecos.fws.gov/ecp/species/321	12/19/1994
Delta Smelt Biological Opinions	Updated periodically	No	A total of 74 biological opinions have been issued for Delta smelt since 2012. Thirty-one of these have been issued for a project in the GAI.	https://ecos.fws.gov/ecp/species/321	7/24/2024 (latest document)
Delta Smelt Resiliency Strategy	Final	No	CDFW's management plan to improve the condition of Delta smelt.	https://ukiah.wildlife.ca.gov/Conservation/Fishes/Delta-Smelt	7/1/2016
Incidental Take Permits for Delta Smelt	Updated periodically	No	CDFW's list of incidental take permits issued for the delta smelt from its publicly available document search website. There are 39 documents in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	10/24/2024 (latest document)
Recovery Plan for the Southern Distinct Population Segment of North American Green Sturgeon (<i>Acipenser medirostris</i>)	Final	Yes	NMFS' recovery plan for the Southern DPS of green sturgeon plan. The recovery criteria that must be achieved before delisting can occur are: - Census population remains at or above 3,000 for 3 generations (or at least 813 spawners for approximately 66 years). In addition, the effective population size must be at least 500 individuals in any given year and each annual spawning run must be composed of a combined total, from all spawning locations, of at least 500 adult fish in any given year. - Successful spawning in at least two rivers within their historical range, determined by the annual presence of larvae for at least 20 years. - A net positive trend in juvenile and subadult abundance is observed over the course of at least 20 years. - Population is characterized by a broad distribution of size classes representing multiple cohorts that are stable over the long term (20 years or more).	https://www.fisheries.noaa.gov/species/green-sturgeon#conservation-management	8/8/2018
Southern DPS of the North American Green Sturgeon 5-Year Review	Updated periodically	Yes	NMFS' most recent review of the condition of this species population segment.	https://www.fisheries.noaa.gov/resource/document/green-sturgeon-5-year-review	11/1/2021
Critical Habitat Designation for Southern DPS of North American Green Sturgeon	Final	Yes	NMFS' designation of critical habitat for the Southern DPS green sturgeon.	https://www.fisheries.noaa.gov/species/green-sturgeon#conservation-management	10/9/2009
Green Sturgeon Biological Opinions	Updated periodically	No	NMFS' list of the 137 biological opinions that have been used for green sturgeon in California, 34 of which occur in the GAI.	https://repository.library.noaa.gov/	7/1/2024 (latest document)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes	Final	No	FWS' recovery plan for the Sacramento-San Joaquin Delta native fishes. Although not a specific target for recovery in this plan, longfin smelt is included in this recovery plan with goals for population improvement as a requirement for delisting of other species. The goals for longfin smelt in this plan are: - Longfin smelt must be captured in all recovery zones in 5 of 10 years, in two recovery zones for an additional year, and at least one recovery zone for 3 of the 4 remaining years, with no failure to meet site criteria in consecutive years. - Longfin smelt abundance must be equal to or greater than the predicted abundance for 5 of 10 years.	https://ecos.fws.gov/ecp/species/321	11/26/1996
Endangered and Threatened Wildlife and Plants; Endangered Species Status for the San Francisco Bay-Delta Population Segment of the Longfin Smelt	Final	No	Final <i>Federal Register</i> listing of endangered status for longfin smelt.	https://www.fws.gov/species-publication-action/endangered-and-threatened-wildlife-and-plants-endangered-species-127	7/30/2024
Department of Fish and Game Report to the Fish and Game Commission: A Status Review of the Longfin Smelt (<i>Spirinchus thaleichthys</i>) in California	Final	No	CDFW's formal review of the species' condition.	https://wildlife.ca.gov/Conservation/Fishes/Longfin-Smelt (not downloadable from this link but available in archive)	1/23/2009
Incidental Take Permits for Longfin Smelt	Updated periodically	No	CDFW's list of incidental take permits issued for the longfin smelt from its publicly available document search website. There are 47 documents in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	10/24/2024 (latest document)
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	Final	Yes	NMFS' recovery plan for the 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 that are 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
Critical Habitat Designation for Steelhead	Final	Yes	NMFS' designation of critical habitat for steelhead.	https://www.fisheries.noaa.gov/resource/map/steelhead-trout-critical-habitat-map	8/13/2018
California Central Valley Steelhead Biological Opinions	Updated periodically	No	A total of 173 biological opinions have been issued for steelhead since 2014; 29 of these have been issued for a project in the GAI.	https://repository.library.noaa.gov/	7/1/2024 (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, of which the Central Valley management area occurs in the GAI. This plan includes stream-specific recommendations pertaining to the Mokelumne River.	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&usg=AOvVaw1GUboKPeGb7OoSOLkc7IH7	2/1/1996
Incidental Take Permits for Steelhead	Updated periodically	No	CDFW's list of incidental take permits issued for steelhead from its publicly available document search website. There are 46 documents in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	10/24/2024 (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://www.fws.gov/node/4746436	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 requires an inventory of known natural resources and general guidelines to comply with federal and state laws. Five state park entities occur in the GAI. Those with specific information pertinent to Chapters 7 and 8 of this RAMNA are listed below.	https://www.parks.ca.gov/?page_id=21299	4/1/2010
Cosumnes River Preserve Management Plan	Final	Yes	CDFW's management plan for the Cosumnes River Ecological Preserve, developed in partnership with SWRCB, BLM, and Sacramento County. Includes a variety of goals for aquatic habitat enhancement and restoration.	https://wildlife.ca.gov/Lands/Planning/Cosumnes-River-Preserve	3/1/2008
Final General Plan Prairie City State Vehicular Recreation Area	Final	Yes	This is the management plan for the Prairie City State Vehicular Recreation Area. Swainson's hawks are known to nest in the park. Includes goals to improve areas that have experienced substantial erosion from surface water runoff.	https://www.parks.ca.gov/?page_id=21299	9/1/2016
Final 2022 Prairie City State Vehicular Recreation Area Wildlife Habitat Protection Plan	Final	Yes	Wildlife habitat protection plan for the Prairie City State Vehicular Recreation Area. Establishes baselines for valley elderberry longhorn beetle by having at least 248 blue elderberry plants, as well as having at least 16.3 acres of wetlands consisting of at least 228 aquatic features. Includes objectives to enhance and restore aquatic habitats, particularly vernal pool habitat.	https://ohv.parks.ca.gov/?page_id=1221	9/22/2022
FWS Land Management Plans	See below	See below	See below	See below	See below
Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan	Final	Yes	FWS' conservation plan for Stone Lakes National Wildlife Refuge. The refuge is known to have occurrences of vernal pool fairy shrimp (<i>Branchinecta lynchi</i>), valley elderberry longhorn beetle, giant garter snake, and Swainson's hawk. Includes objectives to expand riparian habitat in the GAI.	https://ecos.fws.gov/ServCat/Search/Advanced/17	1/5/2007
U.S. Military Land Management Plans	See below	See below	See below	See below	See below
Not applicable	Not applicable	Not applicable	No military lands 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	No	The Wilton Rancheria, Buena Vista Rancheria, Jackson Rancheria, and Shingle Springs Rancheria do not have land management plans that are publicly available.	Not applicable	Not applicable
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.	https://www.californiachaparral.org/_static/875d896940cdc45f383c9c6eaaaf6c57/ecological-restoration-imp-plan-usfs-r5-1-chap-1.pdf?dl=1	1/1/2013

Title	Status	Spatial Data	Reference Purpose	Link	Date
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/detail/eldorado/landmanagement/planning/?cid=fseprd528612	1/1/1988
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. Those in the GAI include El Dorado and Stanislaus National Forests.	https://www.fs.usda.gov/detail/r5/landmanagement/planning/?cid=STELPRDB5349922	1/1/2004
Stanislaus National Forest – Forest Plan Direction	Updated periodically	Yes	USFS' plan for the current Forest Plan management direction based on the original 1991 Stanislaus National Forest Plan. Includes management objectives within the Upper Mokelumne HUC-8. Includes a variety of objectives to enhance and restore aquatic habitat.	https://www.fs.usda.gov/detail/stanislaus/?cid=FSM91_057700	3/1/2017 (last updated)
BLM Land Management Plans	See below	See below	See below	See below	See below
Not applicable	Not applicable	No	No BLM field offices that occur in the GAI have a land management plan that is publicly available.	Not applicable	Not applicable
National Park Service (“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. There are no listed national river segments or potential candidates in the GAI.	https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm	11/15/2024
Not applicable	Not applicable	Not applicable	No NPS lands occur in the GAI.	Not applicable	Not applicable
Local Government Land Management Plans	See below	See below	See below	See below	See below
American River Parkway Natural Resource Management Plan	Draft	No	Sacramento County's management plan for the park, which occurs along the American River from the Folsom Dam to the confluence with the Sacramento River. Valley elderberry longhorn beetle is known to occur in the park. Includes a general goal to improve habitat in the park, along with specific goals related to habitat restoration.	https://regionalparks.saccounty.net/Parks/Pages/NaturalResourcesManagement.aspx	3/1/2021
Water Resources Plans and Documents	See below	See below	See below	See below	See below
2014 Eastern San Joaquin Integrated Regional Water Management Plan Update	Updated periodically	Yes	Eastern San Joaquin County Groundwater Basin Authority's water management plan for the plan area, which includes portions of the Upper Mokelumne HUC-8. Includes goals to improve water quality.	https://www.esjirwm.org/IRWMP/2014-IRWMP	6/5/2014 (last updated)
Eastern San Joaquin Integrated Regional Water Management Plan 2020 Addendum	Draft	Yes	Addendum to the 2014 Eastern San Joaquin Integrated Regional Water Management Plan to meet the updated 2016 Integrated Regional Water Management guidelines.	https://www.esjirwm.org/IRWMP/2020-IRWMP-Addendum	2/11/2021 (last updated)
American River Basin Integrated Regional Water Management Plan	Updated periodically	Yes	Regional Water Authority's management plan for the plan area, which includes portions of the Upper Cosumnes HUC-8. Includes goals to improve ecosystem function of streams and watersheds, improve habitat, restore riparian buffers in developed areas, and restore floodplains.	https://rwah2o.org/programs/integrated-regional-water-management/american-river-basin-irwmp-2018-update/	5/1/2018 (last updated)
Central Valley Flood Protection Plan 2022 Update	Updated periodically (every 5 years)	Yes	California Department of Water Resources' plan to reduce flood risk in the Central Valley. Has a small inclusion of the Upper Mokelumne HUC-8 in its Lower Sacramento River-Delta North Region.	https://water.ca.gov/Programs/Flood-Management/Flood-Planning-and-Studies/Conservation-Strategy	11/1/2022 (last updated)
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. Includes a small portion of the Upper Mokelumne HUC-8.	https://www.usbr.gov/mp/ssjbasinstudy/docs.html	11/1/2014

Title	Status	Spatial Data	Reference Purpose	Link	Date
Groundwater Sustainability Plan Cosumnes Subbasin	Final	Yes	Groundwater sustainability plan developed by the Cosumnes Subbasin Sustainable Groundwater Management Act Working group, which includes portions of the Upper Cosumnes HUC-8. Includes a goal to release 1,500 to 5,000 acre-feet per year of Central Valley Project water from Folsom South Canal into Cosumnes River to improve flows for fish migration.	https://www.cosumnesgroundwater.org/groundwater/cosumnes-gsp/	12/1/2021
Integrated Regional Water Management Plan Cosumnes American Bear Yuba Watersheds, California	Updated periodically	Yes	Water management plan primarily developed by the Nevada and El Dorado Irrigation Districts and the Placer and El Dorado County Water Agencies for the plan area, which includes portions of the Upper Cosumnes HUC-8. Includes a variety of habitat enhancement and restoration goals.	http://cabyregion.org/mdocs-posts/2021-caby-plan-update/	1/1/2021 (last updated)
Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update	Updated periodically	Yes	Water management plan primarily developed by the Upper Mokelumne River Watershed Authority for the plan area, which includes the Upper Mokelumne HUC-8. Includes a variety of habitat enhancement and restoration goals.	https://www.umrwa.org/the-mac-plan	11/1/2018 (last updated)
Mokelumne Watershed Master Plan	Updated periodically	Yes	Watershed plan developed by the East Bay Municipal Utility District to guide future use and management of lands and water within the plan area, which includes the Upper Mokelumne HUC-8. Includes goals to improve ecological integrity through habitat restoration and pest management, reduce the spread of invasive species infestations, and increase the health of riparian habitats.	https://www.ebmud.com/recreation/protecting-natural-habitat	4/1/2008 (last updated)
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. Includes a goal to enhance fisheries for endangered cutthroat trout. Includes a land use designation for open space.	https://www.alpinecountyca.gov/615/General-Plan	8/1/2021
Amador County General Plan	Final	Yes	General plan for Amador County. Includes land use designation for open space and resource use.	https://www.amadorgov.org/departments/planning/general-plan-update-draft-environmental-impact-report-and-draft-general-plan	10/4/2016 (last amended 2022)
Calaveras County General Plan	Updated periodically	Yes	General plan for Calaveras County. Includes land use designation for natural resource lands.	https://planning.calaverasgov.us/General-Plan	11/12/2019 (last amended 2/10/2021)
2004 El Dorado County General Plan	Updated periodically	Yes	General plan for El Dorado County. Requires a minimum setback of 100 feet from all perennial streams, rivers, lakes, and 50 feet from intermittent streams and wetlands. Requires mitigation ratios for different habitat types, including aquatic types. Includes a land use designation for open space and natural resources.	https://www.edcgov.us/Government/planning/pages/adopted_general_plan.aspx	12/10/2019 (last amended)
Sacramento County General Plan of 2005–2030	Updated periodically	Yes	General plan for Sacramento County. Requires a minimum functional setback of 100 feet from the outside edge of stream banks, 50 feet of transitional setback from functional setback along stream corridors, and another 50 feet of extended setback from the transitional setback for recreational uses along stream corridors. Includes policies for the enhancement of Laguna Creek Parkway. Includes a land use designation for natural preserve.	https://planning.saccounty.net/PlansandProjectsIn-Progress/Pages/GeneralPlan.aspx	11/9/2011 (last amended)
San Joaquin County General Plan	Updated periodically	Yes	General plan for San Joaquin County. Requires natural open space buffers along natural waterways. Includes a land use designation for resource conservation.	https://www.sjgov.org/commdev/cgi-bin/cdyn.exe?grp=planning&htm=gp2035	12/1/2016 (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 within 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)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Elk Grove General Plan	Updated periodically	Yes	General plan for the City of Elk Grove. Includes a land use designation for resource management and conservation, which includes, but is not limited to, habitat mitigation, wetland protection, and floodways. Swainson's hawk and the valley elderberry longhorn beetle are known to occur in Elk Grove.	https://www.elkgrovecity.org/strategic-planning-and-innovation/general-plan	12/13/2023 (last amended)
Folsom General Plan 2035	Updated periodically	Yes	General plan for the City of Folsom. Includes a land use designation for open space.	https://www.folsom.ca.us/government/community-development/planning-services/general-plan	8/24/2024 (last amended)
Galt 2030 General Plan	Updated periodically	Yes	General plan for the City of Galt. Includes a land use designation for open space.	https://www.cityofgalt.org/government/community-development/planning/general-plan	5/12/2022 (last amended)
City of Ione General Plan	Final	Yes	General plan for the City of Ione. Includes a land use designation for open space.	https://www.ione.ca.gov/city-council/page/city-ione-general-plan	1/1/2009
City of Isleton 2040 General Plan	Updated periodically	Yes	General plan for the City of Isleton. Policy-CPO-1.3.5 identifies the potential for collaboration on habitat restoration projects in regard to sensitive wildlife, fish, plant species, and waterways. The general plan also includes land use designation for open spaces.	https://planisleton.com/documents/	10/23/2024 (last amended)
City of Jackson General Plan	Updated periodically	No	General plan for the City of Jackson.	https://www.ci.jackson.ca.us/government/planning_commission/general_plan_planning_information.php#outer-9	3/1/2015 (last amended)
City of Plymouth General Plan	Updated periodically	Yes	General plan for the City of Plymouth. Includes land use designation for local natural open space.	https://cityofplymouth.org/planning/	8/9/2009 (last amended)
Sutter Creek General Plan	Updated periodically	Yes	General plan for the City of Sutter Creek. There is a Gold Rush Ranch Conservation Open Space Preserve land use designation, intended to enhance oak woodland habitat and a broad range of wildlife species.	https://www.cityofsuttercreek.org/planning-building	7/1/2019
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
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 Southern California Coastal Water Research Project report describing a pilot study that is tracking wetland conditions statewide.	https://www.sccwrp.org/publications/	4/1/2015

^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.

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4. EXISTING MITIGATION OPPORTUNITIES

SHC § 800.6(a)-authorized advance mitigation project types include purchasing credits and paying fees associated with existing mitigation sources. This chapter summarizes the mitigation credits and values currently available to Caltrans and/or pending through existing HCPs, NCCPs, mitigation and conservation banks, in-lieu fee programs, and MCAs. RCISs, which are a prerequisite to MCAs, are also discussed. Caltrans begins this chapter by describing the advance mitigation credits already held by District 3.

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. Two such projects are within Caltrans District 3 and may inform advance mitigation planning:

- 03-1H520: Habitat Advance Mitigation: Giant Garter Snake and Swainson's Hawk Habitat Mitigation
- 03-2H140: Habitat Advance Mitigation: Wetland, Vernal Pool, and Riparian Habitat Advance Mitigation

Both advance mitigation projects consisted of purchasing bulk credits from six existing or pending mitigation and conservation banks (Table 4-1).

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 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 permit processes by eliminating the need to obtain project-specific incidental take permits from FWS and/or CDFW and providing early documentation of compliance with the CESA and FESA.

Caltrans is a Participating Transportation Agency to the following active NCCP/HCP in the GAI, and may be able to use it to meet its compensatory mitigation needs:

- San Joaquin County Multi-Species Habitat Conservation and Open Space Plan and NCCP/HCP

¹ Pursuant to Section 10 of the FESA or consultations under Section 7 of the FESA.

² Pursuant to FGC § 2835.

Table 4-1. SHOPP Advance Mitigation Credits

Bank Where Credits Were Purchased	Credit Purchase Year	Signatories ^a	Service Area	Credit Type and Quantity
Colusa Basin Mitigation Bank, Sutter Basin Conservation Bank, Muzzy Ranch Conservation Bank	2019, 2021	CDFW and/or FWS	Glenn, Colusa, Sutter, Yuba, Placer, Yolo, Tehama, Solano, San Joaquin, Contra Costa, Napa, Butte, and Sacramento Counties at various locations	22.35 giant garter snake credits 7.0 giant garter snake credits 6.0 Swainson's hawk foraging habitat credits
Colusa Basin Mitigation Bank, Elsie Gridley Conservation Bank, Cosumnes Floodplain Mitigation Bank, Bullock Bend Mitigation Bank	2020	NMFS, EPA, FWS, CDFW, and/or Corps	Tehama, Glenn, Butte, Yuba, Colusa, Sutter, Yolo, Placer, Sacramento, Yolo, Solano, El Dorado, Amador, Contra Costa, and San Joaquin Counties	2.46 seasonal wetland credits 2.23 preserved marsh credits 0.61 vernal pool reestablishment credit 0.9 floodplain mosaic wetland credits 6.0 riparian credits (salmonid riverine/Swainson's hawk nesting buffer restored) credits

^a These signatory agencies are also signatories to the Master Process Agreement (Caltrans et al. 2020).

Figure 4-1 depicts the location of the above-listed NCCP/HCP. Table 4-2 summarizes the signatories, status or date of the plan, plan area, participating transportation agency, covered species, and covered natural communities. Multiple project-specific HCPs in the GAI were not included in Table 4-2 because they were determined to not be a viable mitigation option for Caltrans. For example, they applied to a non-Caltrans single user, covered activities that were not road infrastructure-related and could not be adapted to road infrastructure, or did not provide take coverage that would be usable for Caltrans projects. The South Sacramento HCP, a prominent planning document in the region, was omitted for this reason.

Figure 4-1. HCPs and NCCPs

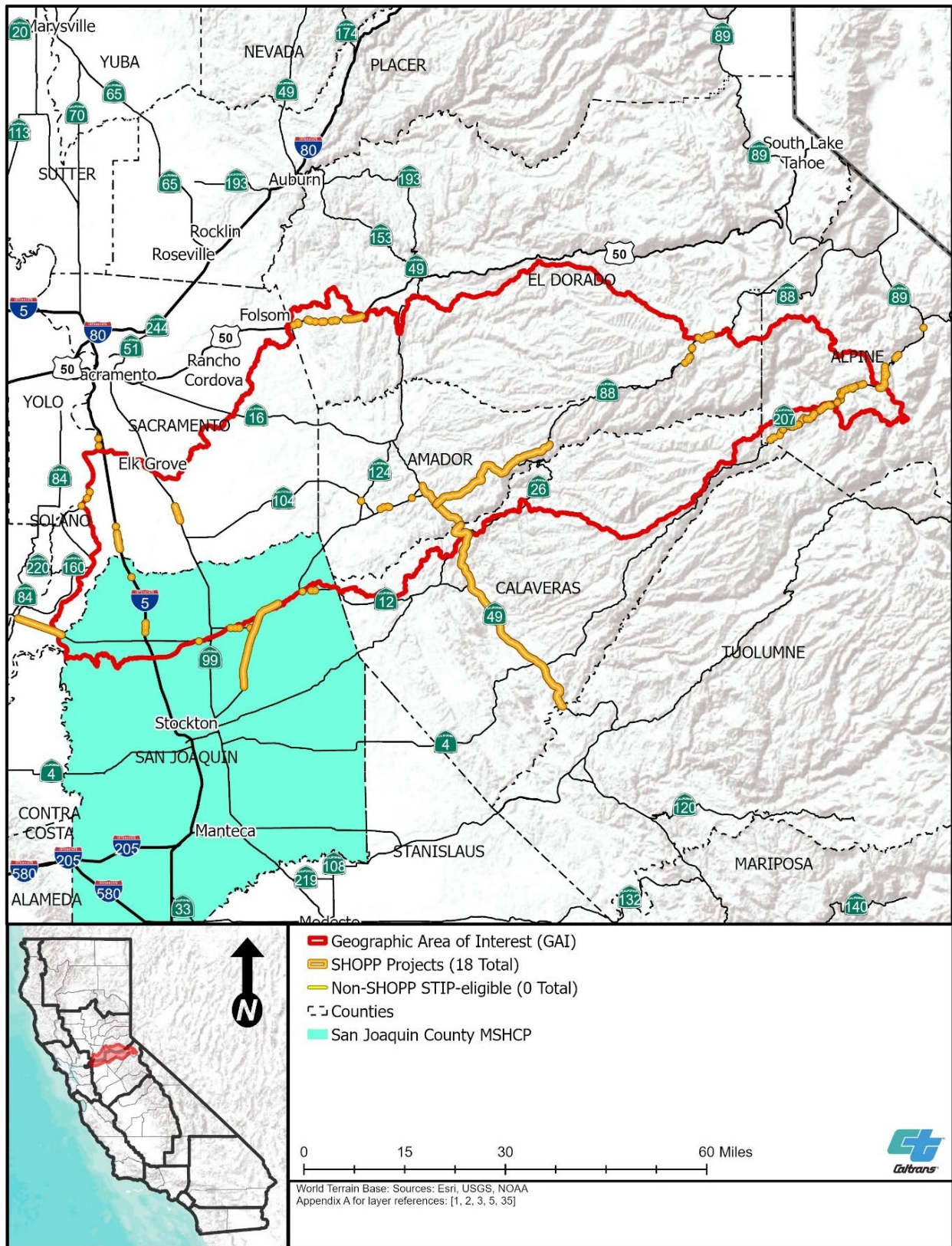


Table 4-2. Overview of HCPs and NCCPs in the GAI^{a,b}

Name	Signatories ^c	Date	Area (acres)	Participating Transportation Agencies ^d	Covered Species	Covered Natural Communities
San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (NCCP/HCP)	FWS, CDFW	2000	900,000+	Caltrans	Valley elderberry longhorn beetle, California red-legged frog, foothill yellow-legged frog, giant garter snake, Swainson's hawk, and 64 other wildlife and 27 plant species	Not applicable

^a Up-to-date information on HCPs and NCCPs can be found at the following websites:
<https://ecos.fws.gov/ecp/report/conservation-plans-region-summary?region=8&type=HCP>
<https://wildlife.ca.gov/conservation/planning/nccp>

^b This table lists HCPs and NCCPs that may be applied to Caltrans' mitigation needs.

^c These signatory agencies are also signatories to the Master Process Agreement (Caltrans et al. 2020).

^d When Caltrans is not an NCCP permittee, under specific conditions and with signatory agency approval, it 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.

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 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 33 active or pending conservation and/or mitigation banks with service areas that overlap all or 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 4-3. 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 4-3. Figures showing conservation and mitigation bank service areas in the GAI that are publicly available are included in Appendix H, *Conservation and Mitigation Bank Service Areas*.

Table 4-3. 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
Antonio Mountain Ranch Mitigation Bank	2018	Active – credits available	FWS, CDFW, Corps, EPA	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	47.81	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, vernal pool tadpole shrimp
Bullock Bend Mitigation Bank	2016	Active – credits available	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; floodplain riparian
Burke Ranch Conservation Bank	2007	Active – credits available	FWS, CDFW	Solano	No	964.14	California tiger salamander, Swainson's hawk foraging habitat, burrowing owl foraging habitat, vernal pool preservation, playa pool preservation, playa wetlands preservation
Cache Slough	Pending	Pending	Corps, EPA, FWS, NMFS	Solano	Unknown	350.14	Freshwater Marsh Complex, Floodplain Riparian Shaded Riverine Aquatic, Chinook salmon, Central Valley steelhead, delta smelt, green sturgeon, giant garter snake

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
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, riparian woodland
Clay Station Mitigation Bank	1999	Active – credits available	FWS, CDFW, Corps, EPA	Sacramento	No	405	Seasonal wetlands/marsh, vernal pool establishment
Deadman Creek Conservation Bank	2007	Active – credits available	FWS	Merced	No	714	California tiger salamander, San Joaquin kit fox, vernal pool fairy shrimp, 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, vernal pool fairy shrimp, vernal pool creation, vernal pool preservation – giant garter snake credits (sold out)
Elsie Gridley Mitigation Bank	2006	Active – credits available	FWS, CDFW, Corps, EPA	Solano	Amendment pending	1,815	Swainson's hawk foraging habitat, valley elderberry longhorn beetle, California tiger salamander upland, burrowing owl foraging habitat, tricolored blackbird, northern harrier, vernal pool fairy shrimp, vernal pool tadpole shrimp, vernal pools, vernal pool creation, perennial wetlands, seasonal wetland creation, freshwater emergent marsh – riparian wetlands (sold out)
Fitzgerald Ranch Conservation Bank	1999	Active – credits available	FWS	San Joaquin	No	808	California tiger salamander, vernal pool fairy shrimp

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
Fremont Landing Conservation Bank	2006	Active – credits available	NMFS	Yolo	No	100	Riparian floodplain forest habitat, shaded riverine aquatic habitat, salmonids, 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, vernal pool tadpole shrimp
Harmony Conservation Bank	2025	Active – credits available	FWS	Colusa	Yes	65	Valley elderberry longhorn beetle
Johnson Cosumnes Mitigation Bank	Pending	Pending	CDFW, NMFS, Corp, EPA	Sacramento	Unknown	217	Swainson's hawk, valley elderberry longhorn beetle, Central Valley steelhead
Laguna Terrace East Conservation Bank	2008	Active – credits available	FWS	Sacramento	No	200	Swainson's hawk, ^d vernal pool preservation (sold out)
Liberty Island Conservation Bank	2010	Active – credits available	FWS, CDFW, NMFS	Yolo	No	186	Chinook salmon, Central Valley steelhead, delta smelt, longfin smelt, tule marsh shaded riverine aquatic habitat
Mallard Farms Conservation Bank	Pending	Pending	FWS, CDFW, NMFS are anticipated	Solano	Unknown	700	Delta smelt, longfin smelt, Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, Central Valley steelhead, central California coast steelhead, southern DPS green sturgeon

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
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, San Joaquin Orcutt grass
Noonan Ranch Conservation Bank	2009	Active – credits available	FWS	Solano	No	189	California tiger salamander, vernal pool fairy shrimp, Contra Costa goldfields, riparian preservation
North Bay Highlands Conservation Bank	2014	Active – credits available	FWS	Marin	No	609	California red-legged frog
North Delta Fish Conservation Bank	2022	Active – credits available	FWS, CDFW, NMFS	Yolo	No	190	Salmonid (preservation), salmonid (restoration), delta smelt, longfin smelt, riparian shaded riverine aquatic, tule marsh shaded riverine aquatic
North Suisun Mitigation Bank	2008	Active – credits available	FWS, CDFW, Corps, EPA	Solano	No	627	California tiger salamander, vernal pool fairy shrimp, vernal pool tadpole shrimp, San Joaquin Valley Orcutt grass, Contra Costa goldfields, vernal pool creation (sold out)
Ohlone West Conservation Bank	2016	Active – credits available	FWS, CDFW	Alameda	No	640	California red-legged frog, California tiger salamander, Alameda whipsnake, Callippe silverspot butterfly
Oursan Ridge Conservation Bank	2017	Active – credits available	FWS, CDFW	Contra Costa	No	430	California red-legged frog, Alameda whipsnake

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
Patrick Shea Conservation Bank	Pending	Pending	FWS, CDFW	Sacramento	Yes	142	Valley elderberry longhorn beetle , stream habitat preservation, riparian habitat preservation, 1602 riparian restoration
Piedra Azul Conservation Bank	2022	Active – credits available	FWS, CDFW	Merced	Yes	2,418	California tiger salamander, California red-legged frog, San Joaquin kit fox, Swainson's hawk, burrowing owl
Porter Ranch Mitigation Bank	2013	Pending	FWS, Corps, EPA	Butte	No	663.25	Vernal pool fairy shrimp, vernal pool tadpole shrimp, vernal pool establishment seasonal wetlands, Swainson's hawk foraging habitat, valley elderberry longhorn beetle, oak/elderberry savanna preservation/creation
Ridge Top Ranch Wildlife Conservation Bank	2014	Active – credits available	FWS	Solano	No	745	California red-legged frog, Callippe silverspot butterfly
Sacramento River VELB Conservation Bank	2025	Active – credits available	FWS	Colusa	Yes	13	Valley elderberry longhorn beetle
Shin Kee Mitigation Bank	Pending	Pending	Corps, EPS, FWS, NMFS	San Joaquin	Unknown	78.4	Freshwater tidal marsh, giant garter snake

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
SMUD Nature Preserve Mitigation Bank	2014	Active – credits available	FWS, Corps, EPA, CDFW	Sacramento	No	1,132	California tiger salamander – central DPS – aquatic (CTS central aquatic), California tiger salamander – central DPS – upland (CTS Central upland), tricolored blackbird, vernal pool fairy shrimp – establishment, vernal pool fairy shrimp – preservation, vernal pool tadpole shrimp – establishment, vernal pool tadpole shrimp – preservation, Bogg's Lake hedge hyssop, dwarf downingia, legenera limosa, Lobb's aquatic buttercup, Sacramento Orcutt grass, annual grassland, open water (preservation), seasonal wetlands (preservation), vernal pool (404), vernal pool preservation (404), vernal swale creation (404), vernal swale preservation (404), riparian (preservation)
Sparling Ranch Conservation Bank	2017	Active – credits available	FWS, CDFW	Santa Clara and San Benito	No	2002	California red-legged frog, California tiger salamander
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, 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, seasonal wetland (sold out)
Van Vleck Mitigation Bank	2009	Active – credits available	FWS, CDFW, Corps, EPA	Sacramento	No	775	Swainson's hawk, vernal pool preservation, vernal pool creation

Name	Year Approved	Current Status	Signatories ^b	Bank Location (County) ^c	Instrument Includes Pre-transfer Credit Sales?	Area (acres)	Credit Types
Vieira Ranch Conservation Bank	2024	Active – credits available	FWS, CDFW	Alameda	Yes	670	California tiger salamander, California red-legged frog, burrowing owl, San Joaquin kit fox
White Rock Road Properties – Scott Road Conservation Bank	2019	Active – credits available	FWS	Sacramento	No	191	Vernal pool preservation
Zacharias Ranch Mitigation Bank	2025	Pending	Corps, EPA, NMFS	Sacramento	Unknown	580	Freshwater marsh complex, EFH Chinook salmon

^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 These signatory agencies are also 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; see Appendix H.

^d For the Laguna Terrace East Conservation Bank, Swainson's hawk mitigation is available in Sacramento County on a case-by-case basis as approved by the CEQA lead.

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 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 4-4, Figure 4-2). This in-lieu fee program’s instrument has been amended to include pre-transfer credit purchases, covers aquatic resources and vernal pools, and has three service areas for different resources under its jurisdiction in these two categories that overlap the GAI, as shown on Figure 4-2. The GAI also overlaps the South Sacramento In-Lieu Fee Program’s service area, but this program is associated with the South Sacramento HCP, which does not include transportation projects as covered activities and is, therefore, not likely to be usable by Caltrans. For this reason, the South Sacramento In-Lieu Fee Program was omitted from Table 4-4.

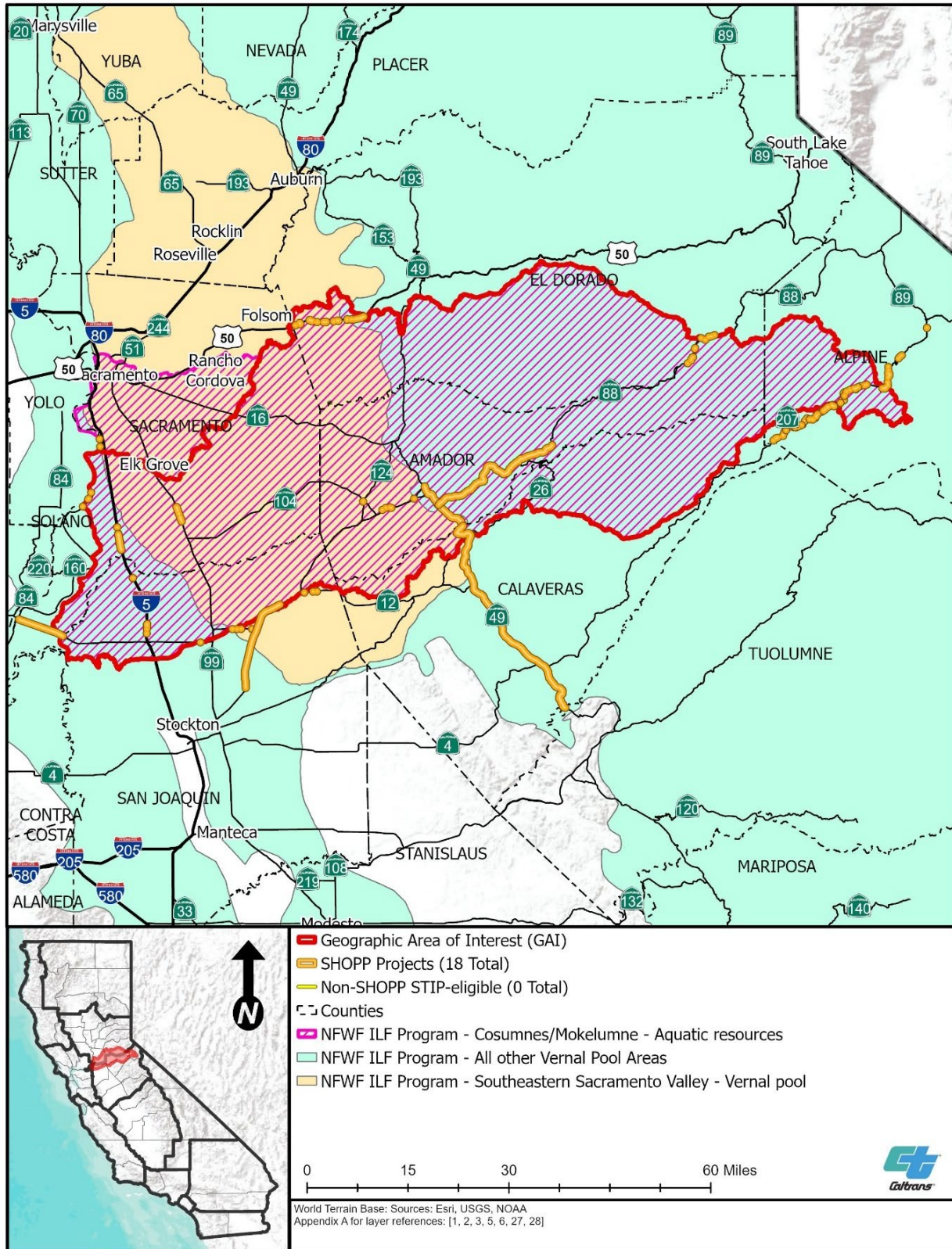
Table 4-4. Overview of In-lieu Fee Programs in the GAI^a

Name	Year Approved	Signatories ^b	Instrument Includes Pre-transfer Credit Purchases?	Location	Credit Types
Sacramento District California In-Lieu Fee Program	2014	Corps, EPA, NMFS, RWQCB, NFWF	Yes	Corps Sacramento District Boundary (entire)	▪ Cosumnes/Mokelumne aquatic resources ▪ Southeastern Sacramento Valley vernal pool ▪ 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 All agencies other than NFWF are also signatories to the Master Process Agreement (Caltrans et al. 2020).

Figure 4-2. In-lieu Fee Program Service Areas



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 the 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 2023).³ 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 boundaries that overlap the GAI. Because MCAs are issued once an RCIS has been approved, there are currently no MCAs in this GAI. Both the Yolo County and East Bay RCISs are adjacent to the GAI, but do not overlap. However, potential future MCA service areas could overlap with the GAI, since MCA service areas are ecologically based and not bound by RCIS boundaries.

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* (CDFW 2024) outline how a wildlife connectivity action developed under a BEI or MCA program may be applied as conservation credits for projects. It contains a scoring system that allows the benefits of wildlife connectivity actions to be assessed and converted into conservation credits based on the biology of the target species, the type and quality of habitats being connected, site topography, the design of the connectivity structure, and several other factors. Connectivity information for the GAI is summarized in Section 2.9.

³ <https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation>

5. MODELED ESTIMATED IMPACTS

In this chapter, Caltrans documents the potential compensatory mitigation needs in the GAI for fiscal years 2023/24 to 2032/33. Needs were based on estimated potential compensatory mitigation requirements of Caltrans' anticipated SHOPP transportation projects as well as regional and local STIP-eligible transportation projects. 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, and major assumptions, to estimate transportation-related compensatory mitigation needs in the GAI; and
- provides its estimate of impacts for the 10-year planning period for species of mitigation need, special-status species potentially co-occurring with the species of mitigation need, aquatic resources, and riparian habitat.

Because Caltrans District 3 chose to focus the analysis on terrestrial and aquatic resources (Section 1.5), the terrestrial resources results presented below are provided for the Great Valley, Sierra Nevada, and Sierra Nevada Foothills Ecoregion Sections, and the aquatic resources results are provided for the Upper Cosumnes and Upper Mokelumne sub-basins, which define the GAI.

5.1 Approach

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

At this time, SHOPP transportation project needs are forecast quantitatively through the SAMNA model developed for the AMP, and STIP-eligible needs are addressed qualitatively. 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

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, including the riparian landcover dataset. 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) and the *Statewide Riparian Landcover Dataset* (Caltrans 2023a).

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 2024a). 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 18 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 18 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, 2024b). The SAMNA model, its foundation, and assumptions are described in the *Statewide Advance Mitigation Needs Assessment Report* (Caltrans 2024b) 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 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 Caltrans 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 a backlog exists of transportation projects that potentially need these funds.

At this time, no planned STIP-eligible transportation projects were identified in the GAI for fiscal years 2023/24 to 2032/33.

Non-SHOPP STIP-eligible Potential Impacts

Because no planned STIP-eligible transportation projects were identified in the GAI for fiscal years 2023/24 to 2032/33, no STIP-eligible related impacts or mitigation needs are anticipated.

5.2 Estimated Wildlife Impacts

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

Below, estimated impacts are presented for the ecoregion sections in the GAI for species of mitigation need identified by Caltrans District 3, as well as for species that may co-occur in their habitats. The complete results of the SAMNA—inclusive of the 18 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 federally and state threatened, endangered, or sensitive species; state fully protected or rare species; or state species of special concern (Caltrans 2024b). Based on a search of the species-attributed vegetation layer, 140 special-status terrestrial species have the potential to occur in the GAI (Section 2.7; Caltrans 2024b). Using the methods described in Section 5.1.1, the SAMNA analysis determined that 17 SHOPP transportation projects could potentially affect 24 habitat types, which could support up to 73 special-status species in the 3 ecoregion sections in the GAI (Table 5-1).

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 is anticipated (Section 1.5). The terrestrial species of mitigation need, as identified in Section 1.5—California red-legged frog, foothill yellow-legged frog, giant garter snake, Swainson's hawk, and valley elderberry longhorn beetle—were included in the analysis and each is discussed briefly in the subsections below.

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

Ecoregion Section	Number of Caltrans SHOPP Projects ^a	Number of Habitats	Number of Special-status Species ^{b,c}	Estimated Total Habitat Impact (acres)
Great Valley	9	7	39	11.8
Sierra Nevada	4	15	37	34.0
Sierra Nevada Foothills	5	9	49	40.8
Total^d	17	24	73	86.6

^a Transportation projects are listed in Appendix B.

^b Special-status terrestrial plant and wildlife species evaluated through the SAMNA consisted of federal and state threatened, endangered, or sensitive species; state fully protected or rare species; or state species of special concern.

^c Included in the SAMNA; see SAMNA report (Caltrans 2024b).

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

5.2.1. California Red-legged Frog

This species was chosen as a species of mitigation need because of its status and the ongoing need for compensatory mitigation for transportation projects in the GAI. California red-legged frog is a federally threatened amphibian species and a California species of special concern that occurs in freshwater habitats such as slow-moving streams, pools within streams, and human-made ponds that can sustain water for at least 20 weeks during the year. During wet periods, they are known to use a variety of upland habitats for dispersal and foraging.

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 18 SHOPP transportation projects evaluated, 5 are forecast to affect 72.9 acres of California red-legged frog habitat in the GAI (Table 5-2; Caltrans 2024b).

5.2.2. Foothill Yellow-legged Frog

This species was chosen as a species of mitigation need because of its status and the ongoing need for compensatory mitigation for transportation projects in the GAI. The only population segment of foothill yellow-legged frog found in the GAI is the South Sierra DPS (federally listed as a candidate for endangered, state listed as endangered, and a federally sensitive species).

Using the methods described in Section 5.1.1, impacts on the foothill yellow-legged frog and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B, *Transportation Projects*). Of the 18 SHOPP transportation projects evaluated, 5 are forecast to affect 72.9 acres of foothill yellow-legged frog habitat in the GAI (Table 5-2; Caltrans 2024b).

5.2.3. Giant Garter Snake

This species was chosen as a species of mitigation need because of its status and the ongoing need for compensatory mitigation for transportation projects in the GAI. Giant garter snake is a federally and state threatened reptile species that occurs in marshes, sloughs, drainage canals, and irrigation ditches. Because of development in the Central Valley and Sierra Nevada, including the construction of dams, their habitat has become fragmented or destroyed (Nafis 2024).

Using the methods described in Section 5.1.1, impacts on giant garter snake and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). Of the 18 SHOPP transportation projects evaluated, 9 are forecast to affect 4.3 acres of giant garter snake habitat in the GAI (Table 5-2; Caltrans 2024b).

5.2.4. Swainson's Hawk

Swainson's hawk is a state threatened bird species that nests throughout much of western North America, with an isolated breeding population in California's Central Valley. The species requires large open areas of suitable foraging habitat, relying heavily on agricultural crops because of development. Suitable nesting habitat includes trees within mature riparian forest or corridors, lone oak trees and oak groves, and mature roadside trees (CDFW 2016c).

Using the methods described in Section 5.1.1, impacts on Swainson's hawk and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). Of the 18 SHOPP transportation projects evaluated, 10 are forecast to affect 5.0 acres of Swainson's hawk habitat in the GAI (Table 5-2; Caltrans 2024b).

5.2.5. Valley Elderberry Longhorn Beetle

This species was chosen as a species of mitigation need because of its status and the ongoing need for compensatory mitigation for transportation projects in the GAI. Valley elderberry longhorn beetle is a federally threatened invertebrate that occurs in California's Central Valley from Shasta County in the north through Madera County in the south. The species is dependent on its host plant, the elderberry, a shrub that grows in riparian areas and foothill oak woodlands in California.

Using the methods described in Section 5.1.1, impacts on valley elderberry longhorn beetle and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). Of the 18 SHOPP transportation projects evaluated, 4 are forecast to affect 0.9 acre of valley elderberry longhorn beetle habitat in the GAI (Table 5-2; Caltrans 2024b).

5.2.6. 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 3 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 39 special-status terrestrial species that potentially use the same habitats in the Great Valley Ecoregion Section (Table 5-3),
- an additional 36 special-status terrestrial species that potentially use the same habitats in the Sierra Nevada Ecoregion Section (Table 5-4), and
- an additional 49 special-status terrestrial species that potentially use the same habitats in the Sierra Nevada Foothills Ecoregion Section (Table 5-5).

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

Ecoregion Section	California Red-legged Frog: Number of Caltrans SHOPP Projects^a	California Red-legged Frog: Estimated Habitat Impact (acres)^b	Foothill Yellow-legged Frog: Number of Caltrans SHOPP Projects^a	Foothill Yellow-legged Frog: Estimated Habitat Impact (acres)^b	Giant Garter Snake: Number of Caltrans SHOPP Projects^a	Giant Garter Snake: Estimated Habitat Impact (acres)^b	Swainson's Hawk: Number of Caltrans SHOPP Projects^a	Swainson's Hawk: Estimated Habitat Impact (acres)^b	Valley Elderberry Longhorn Beetle: Number of Caltrans Projects^a	Valley Elderberry Longhorn Beetle: Estimated Habitat Impact (acres)^b
Great Valley	0	0.0	0	0.0	8	4.2	8	4.0	1	0.2
Sierra Nevada	1	32.2	1	32.2	0	0.0	0	0.0	0	0.0
Sierra Nevada Foothills	5	40.7	5	40.7	1	0.1	2	1.0	3	0.7
Total^b	5	72.9	5	72.9	9	4.3	10	5.0	4	0.9

^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 Species of Mitigation Need and Co-occurring Species Habitat: Great Valley Ecoregion Section (acres)

Common Name	Species Name	Status	Annual Grassland	Riverine	Valley Foothill Riparian
Not applicable	Not applicable	Total	3.9	0.2	0.2
Species of Mitigation Need	See below	See below	See below	See below	See below
Giant gartersnake	<i>Thamnophis gigas</i>	FT, ST	3.9	0.2	0.2
Swainson's hawk	<i>Buteo swainsoni</i>	FS, ST	3.9	0.0	0.2
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT	0.0	0.0	0.2
Plants	See below	See below	See below	See below	See below
Boggs Lake hedge-hyssop	<i>Gratiola heterosepala</i>	FS, SE	3.9	0.0	0.0
Sacramento Orcutt grass	<i>Orcuttia viscida</i>	FE, SE	3.0	0.0	0.0
Slender Orcutt grass	<i>Orcuttia tenuis</i>	FT, SE	3.0	0.0	0.0
Succulent owl's-clover	<i>Castilleja campestris</i> var. <i>succulenta</i>	FT, SE	3.9	0.0	0.0
Invertebrates	See below	See below	See below	See below	See below
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	1.8	0.0	0.0
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	2.8	0.0	0.0
Amphibians	See below	See below	See below	See below	See below
California tiger salamander	<i>Ambystoma californiense</i>	FE, FT, ST	3.9	0.0	0.2
Western spadefoot	<i>Spea hammondi</i>	FS, SSC	3.9	0.2	0.0
Reptiles	See below	See below	See below	See below	See below
Blainville's horned lizard	<i>Phrynosoma blainvillii</i>	FS, SSC	3.9	0.0	0.2
Giant gartersnake	<i>Thamnophis gigas</i>	FT, ST	3.9	0.2	0.2
Birds	See below	See below	See below	See below	See below
Bald eagle	<i>Haliaeetus leucocephalus</i>	FS, SE, SFP, SFS	3.9	0.2	0.2

Common Name	Species Name	Status	Annual Grassland	Riverine	Valley Foothill Riparian
Bank swallow	<i>Riparia riparia</i>	FS, ST	0.0	0.2	0.0
Black rail	<i>Laterallus jamaicensis</i>	FS, ST, SFP	0.0	0.2	0.0
Burrowing owl	<i>Athene cunicularia</i>	FS, SSC	3.9	0.0	0.2
Golden eagle	<i>Aquila chrysaetos</i>	FS, SFS, SFP	3.9	0.0	0.2
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SSC	3.9	0.0	0.0
Least bittern	<i>Ixobrychus exilis</i>	SSC	0.0	0.2	0.0
Lesser sandhill crane	<i>Grus canadensis canadensis</i>	SSC	0.3	0.0	0.0
Loggerhead shrike	<i>Lanius ludovicianus</i>	SE, SSC	3.9	0.0	0.2
Modesto song sparrow	<i>Melospiza melodia mailliardi</i>	SSC	3.9	0.2	0.2
Mountain plover	<i>Charadrius montanus</i>	FS, SSC	0.3	0.0	0.0
Northern harrier	<i>Circus cyaneus</i>	SSC	3.9	0.2	0.2
Oregon vesper sparrow	<i>Pooecetes gramineus affinis</i>	SSC	0.1	0.0	0.0
Purple martin	<i>Progne subis</i>	SSC	0.0	0.2	0.0
Redhead	<i>Aythya americana</i>	SSC	0.0	0.2	0.0
Short-eared owl	<i>Asio flammeus</i>	SSC	3.9	0.0	0.2
Tricolored blackbird	<i>Agelaius tricolor</i>	FS, ST, SSC	3.9	0.0	0.2
White-tailed kite	<i>Elanus leucurus</i>	FS, SFP	3.9	0.0	0.2
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	SSC	3.9	0.0	0.0
Mammals	See below	See below	See below	See below	See below
American badger	<i>Taxidea taxus</i>	SSC	3.9	0.0	0.2
Pallid bat	<i>Antrozous pallidus</i>	FS, SSC	3.9	0.2	0.2
Ringtail	<i>Bassariscus astutus</i>	SFP	3.5	0.0	0.2
San Joaquin pocket mouse	<i>Perognathus inornatus</i>	FS	3.9	0.0	0.0

Common Name	Species Name	Status	Annual Grassland	Riverine	Valley Foothill Riparian
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	FS, SSC	3.9	0.2	0.2
Western mastiff bat	<i>Eumops perotis</i>	FS, SSC	0.1	0.0	0.0
Western red bat	<i>Lasiurus blossevillii</i>	SSC	3.9	0.2	0.2
Yuma myotis	<i>Myotis yumanensis</i>	FS	3.9	0.2	0.2

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

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

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Douglas Fir	Mixed Chaparral	Montane Hardwood-Conifer	Ponderosa Pine	Sierran Mixed Conifer
Not applicable	Not applicable	Total	11.1	0.4	0.5	0.2	6.5	5.4	8.2
Species of Mitigation Need	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	11.0	0.4	0.5	0.2	6.5	5.4	8.2
Foothill yellow-legged frog	<i>Rana boylei</i>	FCE, FCT, FS, SE, ST, SSC	11.0	0.4	0.5	0.2	6.5	5.4	8.2
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below
Layne's ragwort	<i>Packera layneae</i>	FT, SR	0.0	0.0	0.0	0.2	4.9	0.0	0.0
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below	See below
Long-toed salamander	<i>Ambystoma macrodactylum</i>	FE, SE, SFP, SSC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mount Lyell salamander	<i>Hydromantes platycephalus</i>	None	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sierra Nevada yellow-legged frog	<i>Rana sierrae</i>	FE, FS, ST	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yosemite toad	<i>Anaxyrus canorus</i>	FT, FS, SSC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Bird	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	11.1	0.4	0.5	0.2	6.5	5.4	8.2
California spotted owl	<i>Strix occidentalis occidentalis</i>	FS, SSC	0.0	0.0	0.5	0.0	6.5	5.4	8.2
Golden eagle	<i>Aquila chrysaetos</i>	FS, SFS, SFP	11.1	0.4	0.5	0.2	6.5	5.4	8.2

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Douglas Fir	Mixed Chaparral	Montane Hardwood- Conifer	Ponderosa Pine	Sierran Mixed Conifer
Great gray owl	<i>Strix nebulosa</i>	FS, SE, SFS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Loggerhead shrike	<i>Lanius ludovicianus</i>	SE, SSC	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Long-eared owl	<i>Asio otus</i>	SSC	11.1	0.4	0.0	0.2	6.5	5.4	8.2
Northern goshawk	<i>Accipiter gentilis</i>	FS, SSC, SFS	0.0	0.4	0.5	0.2	6.5	5.4	8.2
Northern harrier	<i>Circus cyaneus</i>	SSC	0.0	0.0	0.0	0.0	0.4	0.0	0.0
Olive-sided flycatcher	<i>Contopus cooperi</i>	SSC	0.0	0.0	0.5	0.2	6.5	5.4	8.2
Purple martin	<i>Progne subis</i>	SSC	11.0	0.4	0.5	0.0	6.0	5.4	6.4
Vaux's swift	<i>Chaetura vauxi</i>	SSC	0.0	0.0	0.5	0.2	6.5	5.4	8.2
Yellow warbler	<i>Setophaga petechia</i>	SSC	0.0	0.4	0.5	0.2	6.5	5.4	8.2
Mammals	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	11.1	0.4	0.5	0.2	6.5	5.4	8.2
Fisher	<i>Pekania pennanti</i>	FS, SSC	0.0	0.0	0.5	0.0	0.0	4.5	8.2
Fringed myotis	<i>Myotis thysanodes</i>	FS	11.1	0.4	0.5	0.2	6.5	5.4	8.2
Long-eared myotis	<i>Myotis evotis</i>	FS	0.0	0.4	0.4	0.0	2.6	3.6	6.2
Marten	<i>Martes caurina</i>	FS	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mountain beaver	<i>Aplodontia rufa</i>	FE, SSC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Pallid bat	<i>Antrozous pallidus</i>	FS, SSC	11.1	0.4	0.5	0.2	6.5	5.4	8.2
Ringtail	<i>Bassariscus astutus</i>	SFP	11.1	0.4	0.5	0.2	6.5	5.4	8.2
Sierra Nevada red fox	<i>Vulpes vulpes necator</i>	FS, FE, ST	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Small-footed myotis	<i>Myotis ciliolabrum</i>	FS	11.0	0.4	0.0	0.2	6.5	5.4	8.2
Snowshoe hare	<i>Lepus americanus</i>	SSC	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spotted bat	<i>Euderma maculatum</i>	FS, SSC	11.1	0.4	0.0	0.0	0.0	5.4	8.2

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Douglas Fir	Mixed Chaparral	Montane Hardwood- Conifer	Ponderosa Pine	Sierran Mixed Conifer
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	FS, SSC	11.1	0.4	0.5	0.2	6.5	5.4	8.2
Western mastiff bat	<i>Eumops perotis</i>	FS, SSC	11.0	0.4	0.0	0.2	6.5	5.4	8.2
Western red bat	<i>Lasiurus blossevillei</i>	SSC	11.0	0.4	0.5	0.2	6.5	5.4	8.2
Wolverine	<i>Gulo gulo</i>	FCT, FS, ST, SFP	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Yuma myotis	<i>Myotis yumanensis</i>	FS	11.1	0.4	0.5	0.2	6.5	5.4	8.2

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

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

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak-Foothill Pine	Mixed Chaparral	Montane Hardwood-Conifer	Riverine	Valley Foothill Riparian	Valley Oak Woodland
Not applicable	Not applicable	Total	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2
Species of Mitigation Need	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
California red-legged frog	<i>Rana draytonii</i>	FT, SSC	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2
Foothill yellow-legged frog	<i>Rana boylei</i>	FCE, FCT, FS, SE, ST, SSC	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2
Giant gartersnake	<i>Thamnophis gigas</i>	FT, ST	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Swainson's hawk	<i>Buteo swainsoni</i>	FS, ST	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Valley elderberry longhorn beetle	<i>Desmocerus californicus dimorphus</i>	FT	0.0	0.0	0.0	0.0	0.0	0.0	0.7	0.0
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
El Dorado bedstraw	<i>Galium californicum</i> ssp. <i>sierrae</i>	FE, SR	0.0	0.0	0.0	0.3	0.7	0.0	0.0	0.0
lone manzanita	<i>Arctostaphylos myrtifolia</i>	FT	0.0	0.0	0.0	0.3	0.7	0.0	0.0	0.0
Irish Hill buckwheat	<i>Eriogonum apricum</i> var. <i>prostratum</i>	FE, SE	0.0	0.0	0.0	0.3	0.0	0.0	0.0	0.0
Layne's ragwort	<i>Packera layneae</i>	FT, SR	0.0	0.0	0.0	0.3	0.7	0.0	0.0	0.0
Pine Hill ceanothus	<i>Ceanothus roderickii</i>	FE, SR	0.0	0.0	0.0	0.3	0.7	0.0	0.0	0.0
Pine Hill flannelbush	<i>Fremontodendron decumbens</i>	FE, SR	0.0	0.0	0.0	0.3	0.7	0.0	0.0	0.0
Stebbins' morning-glory	<i>Calystegia stebbinsii</i>	FE, SE	0.0	0.0	0.0	0.3	0.7	0.0	0.0	0.0

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak- Foothill Pine	Mixed Chaparral	Montane Hardwood -Conifer	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
Vernal pool fairy shrimp	<i>Branchinecta lynchi</i>	FT	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vernal pool tadpole shrimp	<i>Lepidurus packardii</i>	FE	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
California tiger salamander	<i>Ambystoma californiense</i>	FE, FT, ST	9.6	4.6	13.4	0.0	0.0	0.0	0.7	3.3
Western spadefoot	<i>Spea hammondi</i>	FS, SSC	0.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0
Reptile	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	11.9	5.0	15.1	0.3	0.0	0.0	1.3	6.2
Bird	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	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2
Burrowing owl	<i>Athene cunicularia</i>	FS, SSC	11.9	5.0	15.1	0.3	0.0	0.0	1.3	6.2
California spotted owl	<i>Strix occidentalis occidentalis</i>	FS, SSC	0.0	0.0	15.0	0.0	0.7	0.0	1.3	0.0
Golden eagle	<i>Aquila chrysaetos</i>	FS, SFS, SFP	11.9	5.0	15.1	0.3	0.7	0.0	1.3	6.2
Grasshopper sparrow	<i>Ammodramus savannarum</i>	SSC	11.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Loggerhead shrike	<i>Lanius ludovicianus</i>	SE, SSC	11.9	5.0	15.1	0.3	0.7	0.0	1.3	6.2
Long-eared owl	<i>Asio otus</i>	SSC	11.9	5.0	15.1	0.3	0.7	0.0	1.3	6.2

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak- Foothill Pine	Mixed Chaparral	Montane Hardwood -Conifer	Riverine	Valley Foothill Riparian	Valley Oak Woodland
Modesto song sparrow	<i>Melospiza melodia mailliardi</i>	SSC	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Northern goshawk	<i>Accipiter gentilis</i>	FS, SSC, SFS	0.0	0.0	0.9	0.0	0.0	0.0	0.0	2.5
Northern harrier	<i>Circus cyaneus</i>	SSC	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2
Olive-sided flycatcher	<i>Contopus cooperi</i>	SSC	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Oregon vesper sparrow	<i>Poocetes gramineus affinis</i>	SSC	11.9	5.0	15.1	0.3	0.0	0.0	0.0	6.2
Osprey	<i>Pandion haliaetus</i>	FS	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2
Peregrine falcon	<i>Falco peregrinus</i>	SFS, SFP	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2
Purple martin	<i>Progne subis</i>	SSC	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
Redhead	<i>Aythya americana</i>	SSC	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tricolored blackbird	<i>Agelaius tricolor</i>	FS, ST, SSC	11.9	0.0	0.0	0.0	0.0	0.0	1.3	0.0
Vaux's swift	<i>Chaetura vauxi</i>	SSC	0.0	0.0	0.9	0.0	0.0	0.0	0.0	0.0
White-tailed kite	<i>Elanus leucurus</i>	FS, SFP	11.9	5.0	15.1	0.3	0.0	0.0	1.3	6.2
Yellow warbler	<i>Setophaga petechia</i>	SSC	0.0	5.0	15.1	0.3	0.7	0.0	1.3	6.2
Yellow-breasted chat	<i>Icteria virens</i>	SSC	0.0	0.0	0.0	0.0	0.0	0.0	1.3	0.0
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	SSC	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Mammals	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	11.9	5.0	15.1	0.3	0.7	0.0	1.3	6.2
Fringed myotis	<i>Myotis thysanodes</i>	FS	11.0	4.6	14.9	0.2	0.7	0.1	1.2	6.2
Pallid bat	<i>Antrozous pallidus</i>	FS, SSC	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2

Common Name	Species Name	Status	Annual Grassland	Blue Oak Woodland	Blue Oak- Foothill Pine	Mixed Chaparral	Montane Hardwood -Conifer	Riverine	Valley Foothill Riparian	Valley Oak Woodland
Ringtail	<i>Bassariscus astutus</i>	SFP	11.9	5.0	15.1	0.3	0.7	0.0	1.3	6.2
Small-footed myotis	<i>Myotis ciliolabrum</i>	FS	11.0	4.6	15.0	0.3	0.7	0.1	1.2	6.2
Spotted bat	<i>Euderma maculatum</i>	FS, SSC	11.8	5.0	15.1	0.0	0.0	0.1	1.2	6.2
Townsend's big-eared bat	<i>Corynorhinus townsendii</i>	FS, SSC	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2
Western mastiff bat	<i>Eumops perotis</i>	FS, SSC	11.9	5.0	15.1	0.3	0.7	0.0	1.3	6.2
Western red bat	<i>Lasiurus blossevillei</i>	SSC	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2
Yuma myotis	<i>Myotis yumanensis</i>	FS	11.9	5.0	15.1	0.3	0.7	0.1	1.3	6.2

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

5.3 Estimated Aquatic Resources Impacts

The quantitative impacts presented in this document are estimates, pursuant to the SAMNA model and the Caltrans riparian landcover dataset. 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 comprise 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. Riparian habitat is described in Section 2.16.

5.3.1. Estimated Impacts on Threatened and Endangered Fish Habitat

Using the methods described in Section 5.1.1, impacts on threatened and endangered fish species habitat were estimated for the 18 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 18 SHOPP transportation projects evaluated, 6 are forecast to affect 3.6 acres of threatened and endangered fish habitat (Table 5-6; Caltrans 2024e).

Caltrans identified fish 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 is anticipated (Section 1.5). The fish species of mitigation need identified in Section 1.5—Chinook salmon, delta smelt, green sturgeon, longfin smelt, and steelhead—were included in the analysis and each is discussed briefly in the subsections below.

Chinook Salmon – Central Valley Spring-run and Sacramento River Winter-run ESU

This species was chosen as a species of mitigation need because of its status and the ongoing need for compensatory mitigation for transportation projects in the GAI. The Central Valley spring-run and Sacramento River winter-run ESUs chinook salmon are federally and state-listed threatened as well as federally and state listed endangered fish species, respectively. These ESUs of Chinook salmon are anadromous fish species that use freshwater rivers in the Central Valley for breeding. Sacramento River winter-run ESU Chinook salmon currently occurs in the Sacramento River (NMFS 2014). Central Valley spring-run ESU Chinook salmon currently occurs within the aquatic resources in the Sacramento Valley and historically was found in the Mokelumne River (NMFS 2014).

Using the methods described in Section 5.1.1, impacts on Chinook salmon – Central Valley spring-run and Sacramento River winter-run ESU and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). Chinook salmon – Central Valley spring-run and Sacramento River winter-run ESU is not expected to be affected by SHOPP projects in the GAI (Caltrans 2024b).

Delta Smelt

This species was chosen as a species of mitigation need because of its status and the ongoing need for compensatory mitigation for transportation projects. Delta smelt is a federally threatened and state listed endangered fish species that is endemic to the upper Sacramento-San Joaquin estuary, including portions of the Sacramento River.

Using the methods described in Section 5.1.1, impacts on delta smelt and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 0.2 acre of delta smelt habitat may be affected by 6 Caltrans SHOPP projects in the GAI (Table 5-6; Caltrans 2024b).

Green Sturgeon

The Southern DPS of green sturgeon in the GAI is a federally threatened species and a state species of special concern. This ESU of green sturgeon includes naturally spawned fish originating from the Sacramento, Feather, and Yuba Rivers. Green sturgeon use riverine, estuary, and marine habitats along the west coast of California, spending the majority of their life cycle in marine waters. Adults enter large river systems to spawn, and their progeny use freshwater streams and brackish bay waters before returning to the ocean. This species was chosen because of its status and the ongoing need for compensatory mitigation for transportation projects in the GAI.

Using the methods described in Section 5.1.1, impacts on green sturgeon and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 0.2 acre of green sturgeon habitat may be affected by 6 Caltrans SHOPP projects in the GAI (Table 5-6; Caltrans 2024b).

Longfin Smelt

Longfin smelt is a federally endangered species and state-threatened fish species that uses coastal streams from the Klamath River to San Francisco Bay. Longfin smelt use coastal estuaries and ocean habitat before entering freshwater streams to spawn. This species was chosen because of its status and ongoing need for compensatory mitigation for transportation projects in the GAI.

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 3.6 acres of longfin smelt habitat may be affected by 6 Caltrans SHOPP projects in the GAI (Table 5-6; Caltrans 2024b).

California Central Valley DPS Steelhead

This species was chosen as a species of mitigation need because of its status and ongoing need for compensatory mitigation for transportation projects in the GAI. California Central Valley DPS steelhead is a federally threatened fish species that uses freshwater streams for breeding and migrates to marine waters to mature before returning to freshwater streams. This species is known to occur in the Cosumnes River, Mokelumne River, and Dry Creek freshwater streams in the GAI.

Using the methods described in Section 5.1.1, impacts on California Central Valley DPS steelhead and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 0.2 acre of California Central Valley DPS steelhead habitat may be affected by 6 Caltrans SHOPP projects in the GAI (Table 5-6; Caltrans 2024b).

5.3.2. Estimated Impacts on Wetlands

Using the methods described in Section 5.1.1, impacts on wetlands were estimated for the 18 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 18 SHOPP transportation projects evaluated, 5 would result in impacts on 1.1 acres of wetland habitat in the GAI, including 0.2 acre of depressional, less than 0.1 acre of depressional natural, 0.1 acre of depressional seasonal, 0.6 acre of freshwater emergent wetland, 0.2 acre of freshwater forested/shrub wetland, and less than 0.1 acre of freshwater pond (Table 5-7; Caltrans 2024b).

Note the SAMNA's terrestrial habitat layers include wetland types (for example, freshwater emergent wetland and freshwater forested/shrub wetland, as shown in Table 2-3). However, wetland forecasts based on the SAMNA's wetland layer are considered more accurate than wetland habitat forecasts based on the SAMNA's terrestrial habitat layers. Therefore, the wetland estimates in Table 5-7 are based solely on the SAMNA's wetland data layer (Caltrans 2024b).

Table 5-6. 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	Delta Smelt	Green Sturgeon	Longfin Smelt	California Central Valley DPS Steelhead	Total
Upper Cosumnes	18040013	0	0	0	0	0	0
Upper Mokelumne	18040012	6	0.2	0.2	3.6	0.2	3.6
Total	Not applicable	6	0.2	0.2	3.6	0.2	3.6

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

^b The SAMNA forecasts impacts on threatened and endangered fish habitat for one of the two 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.

Table 5-7. Summary of Estimated SHOPP Impacts on Wetlands in the GAI (acres)^a

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Depressional	Depressional Natural	Depressional Seasonal	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Freshwater Pond	Total ^b
Upper Cosumnes	18040013	3	0.2	<0.1	0.1	0.1	0.0	0.0	0.4
Upper Mokelumne	18040012	2	0.0	0.0	0.0	0.5	0.2	<0.1	0.7
Total^{b,c}	Not applicable	5	0.2	<0.1	0.1	0.6	0.2	<0.1	1.1

^a Wetland impacts are forecast by the SAMNA Reporting Tool.

^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 18 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 18 SHOPP transportation projects evaluated, 12 would result in impacts on 5.0 acres of non-wetland waters in the GAI, including 0.9 acre of canal/ditch habitat and 4.1 acres of stream/river habitat (Table 5-8; Caltrans 2024b).

Table 5-8. Summary of Estimated SHOPP Impacts on Non-wetland Waters in the GAI (acres)^a

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Canal/Ditch	Stream/River	Total
Upper Cosumnes	18040013	3	0.0	0.5	0.5
Upper Mokelumne	18040012	9	0.9	3.6	4.5
Total^b	Not applicable	12	0.9	4.1	5.0

^a Non-wetland water impacts are forecast by the SAMNA Reporting Tool.

^b 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 18 SHOPP transportation projects evaluated, 6 would result in impacts on 2.6 acres of vernal pool fairy shrimp habitat and 2.9 acres of vernal pool tadpole shrimp habitat in the GAI (Table 5-9; Caltrans 2024b).

Table 5-9. 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
Upper Cosumnes	18040013	3	0.1	1.1	1.1
Upper Mokelumne	18040012	3	2.5	1.8	2.5
Total^b	Not applicable	6	2.6	2.9	3.6

^a The SAMNA forecasts impacts for both HUC-8s in the GAI.

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

5.3.5. Estimated Impacts on 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 2023a). The analysis consisted of an intersection of assumed transportation project footprints for the 13 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 in two ways, based on slope and based on vegetation. Vegetation polygon features used for the analysis were consistent with the SAMNA. Of the 18 SHOPP transportation projects evaluated, 13 could potentially affect 1.7 to 35.3 acres of areas with potential riparian function (Table 5-10).

Table 5-10. Summary of Estimated SHOPP Project Impacts on Areas of Potential Riparian Function in the GAI (acres)

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Slope-based Estimate (acres) ^a	Vegetation Process-based Estimate (acres) ^a
Upper Cosumnes	18040013	3	0.0	4.3
Upper Mokelumne	18040012	10	1.7	31.0
Total^b	Not applicable	13	1.7	35.3

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

^b Totals may be different due to rounding.

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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.

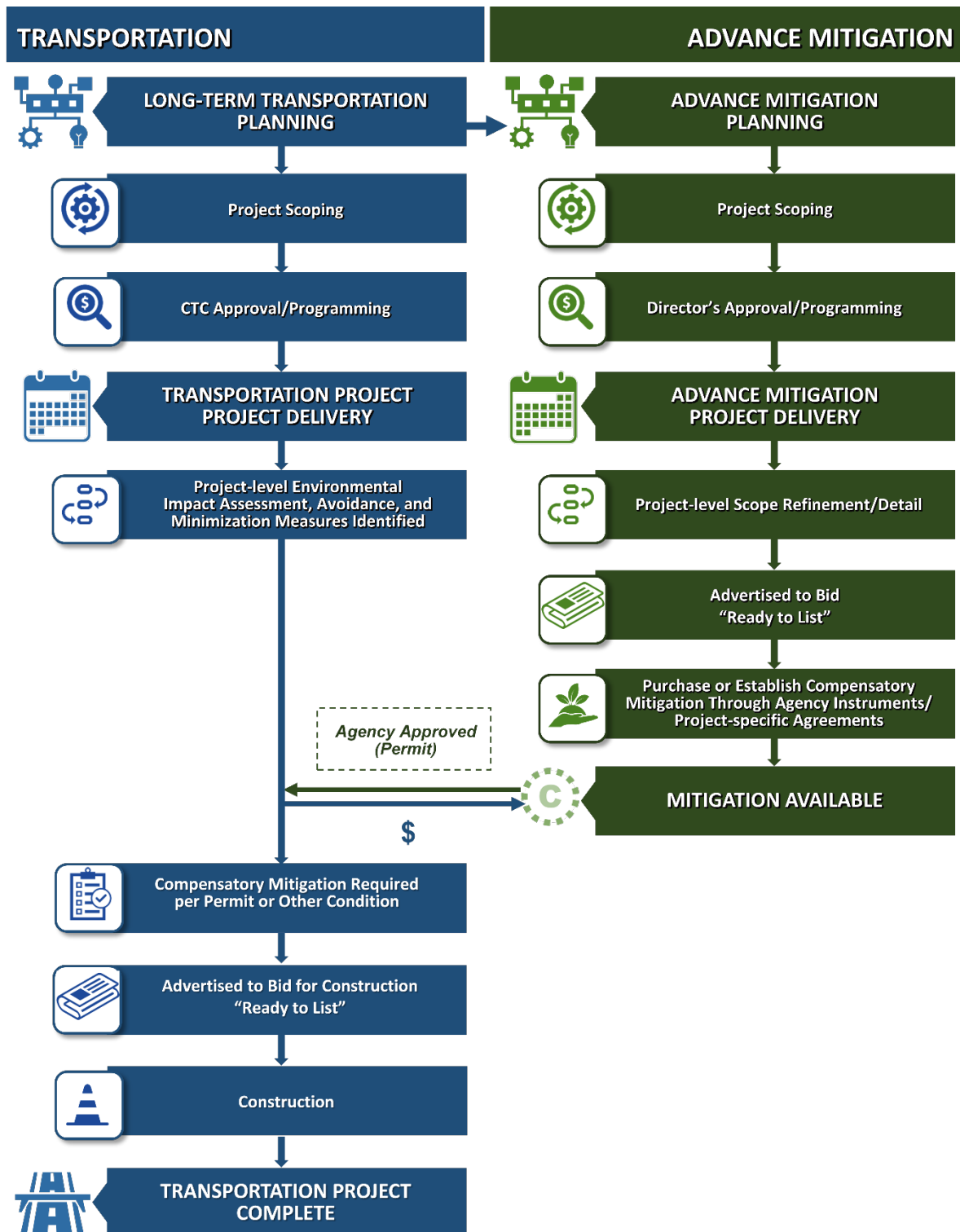
In this chapter, Caltrans summarizes the scheduling considerations and constraints of potential benefiting transportation projects in order to inform advance mitigation project schedules. A time frame for the forecast advance mitigation needs is provided and analyzed. The potentially benefiting transportation 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). Therefore, 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, 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. Approved credits must be in-hand before their offset value, with natural resource regulatory agency approval, may be applied to a 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 hence the AMP cannot feasibly supply compensatory mitigation credits on the required schedule;
- would need compensatory mitigation delivered in a nearer time frame, which may favor seeking existing credits as an AMP advance mitigation project scope; or
- would need compensatory mitigation further in time and, if so, whether there is time to establish new compensatory mitigation.

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

- As shown in Table 6-1 and Figure 6-2, when the SHOPP transportation projects identified previously have their forecast species of mitigation need impacts examined relative to their expected advertising date, the compensatory mitigation needs are spread throughout the 10-year planning period for the Great Valley Ecoregion Section, with the greatest anticipated impacts during the 2031/32 fiscal year.
- As shown in Table 6-2 and in Figure 6-3, when the SHOPP transportation projects identified previously have their forecast species of mitigation need impacts examined relative to their expected advertising date, the compensatory mitigation needs are isolated to fiscal year 2029/30 for the Sierra Nevada Ecoregion Section. Only California red-legged frog and foothill yellow-legged frog are anticipated to be affected by these transportation projects.
- As shown in Table 6-3 and in Figure 6-4, when the SHOPP transportation projects identified previously have their forecast species of mitigation need impacts examined relative to their expected advertising date, the compensatory mitigation needs are clustered near the end of the 10-year planning period, with some mitigation needs in fiscal year 2023/24 for the Sierra Nevada Foothills Ecoregion

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.

Section, with the greatest anticipated impacts during the 2029/30 fiscal year. Mitigation needs are focused on California red-legged frog, foothill yellow-legged frog, Swainson's hawk, giant garter snake, and valley elderberry longhorn beetle.

- As shown in Tables 6-4 through 6-5 and Figures 6-5 through 6-6, when the SHOPP transportation projects identified previously have their aquatic resource impacts examined relative to their expected advertising date, the compensatory mitigation needs for both of the HUC-8 sub-basins are spread throughout the 10-year planning period, as described below:
 - Compensatory mitigation needs in the Upper Cosumnes sub-basin are focused on vernal pools and areas of potential riparian function in fiscal years 2024/25, 2029/30, and 2031/32, with lesser impacts to wetlands and non-wetland waters in fiscal years 2024/25, 2029/30, and 2031/32.
 - Compensatory mitigation needs in the Upper Mokelumne sub-basin are focused on areas of potential riparian function in fiscal years 2023/24, 2025/26, 2028/29, 2029/30, 2030/31, and 2031/32; lesser impacts to fish habitat in fiscal years 2023/24, 2025/26, 2028/29, and 2029/30; to wetlands in fiscal years 2028/29 and 2029/30; to non-wetland waters in fiscal years 2023/24, 2025/26, 2028/29, 2029/30, 2030/31, and 2031/32; and to vernal pools in fiscal years 2025/26, 2029/30, and 2030/31.

Spatially, these transportation projects are distributed throughout the GAI (Figure 6-7).

Table 6-1. Great Valley Ecoregion Section: Estimated Impacts on Species of Mitigation Need, by Transportation Project Delivery Year

Expected Advertisement Year	California Red-legged Frog: Number of Transportation Projects	California Red-legged Frog: Estimated Potential Impacts (acres)	Foothill Yellow-legged Frog: Number of Transportation Projects	Foothill Yellow-legged Frog: Estimated Potential Impacts (acres)	Giant Garter Snake: Number of Transportation Projects	Giant Garter Snake: Estimated Potential Impacts (acres)	Swainson's Hawk: Number of Transportation Projects	Swainson's Hawk: Estimated Potential Impacts (acres)	Valley Elderberry Longhorn Beetle: Number of Transportation Projects	Valley Elderberry Longhorn Beetle: Estimated Potential Impacts (acres)
2023/24	0	0.0	0	0.0	1	0.4	1	0.4	0	0.0
2024/25	0	0.0	0	0.0	1	0.3	1	0.3	0	0.0
2025/26	0	0.0	0	0.0	2	1.0	2	0.8	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	0	0.0	0	0.0	1	0.1	1	0.1	0	0.0
2030/31	0	0.0	0	0.0	1	0.5	1	0.5	0	0.0
2031/32	0	0.0	0	0.0	2	2.0	2	2.0	1	0.2
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Total ^a	0	0.0	0	0.0	8	4.2	8	4.0	1	0.2

^a Totals may be different due to rounding.

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

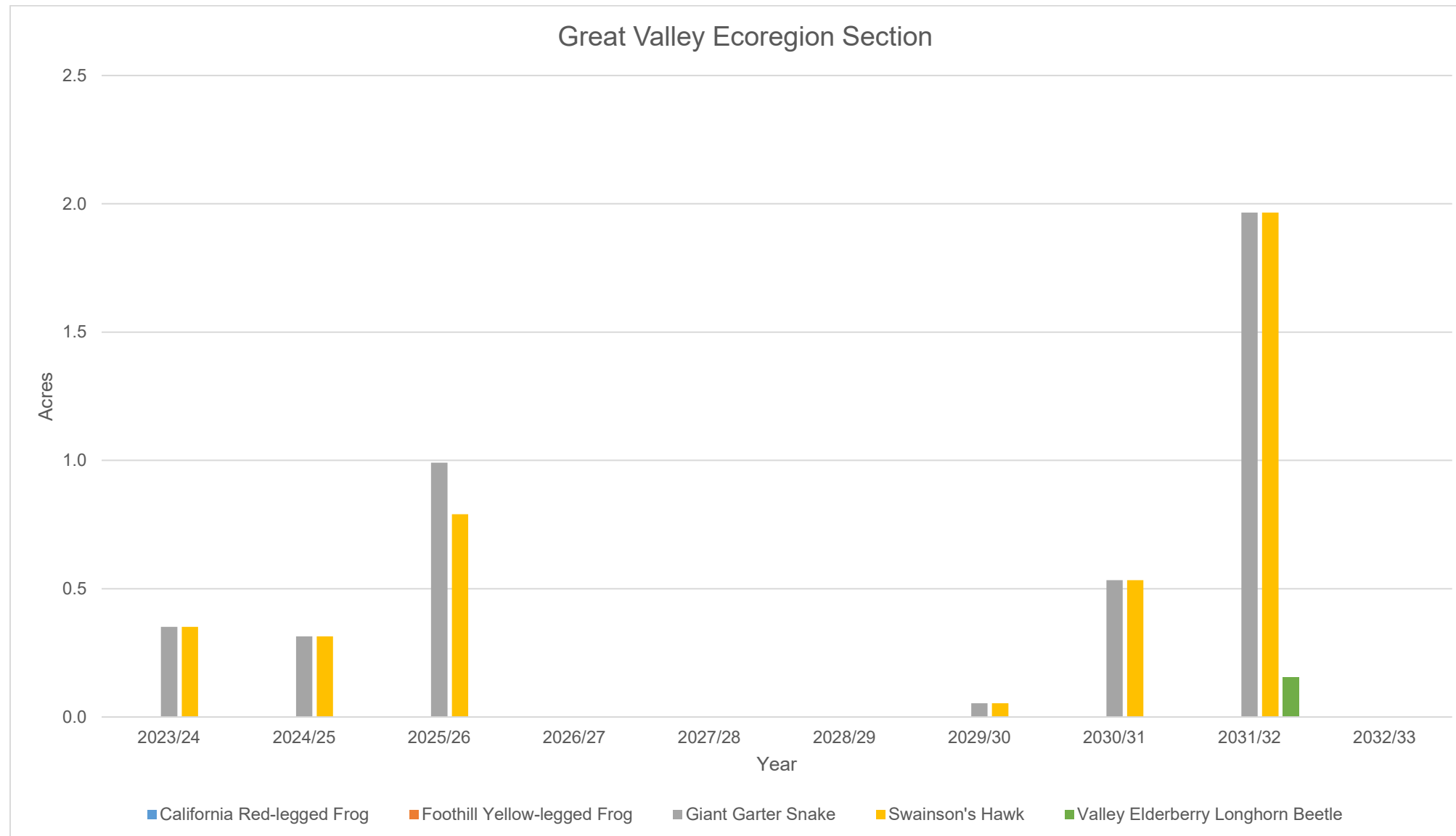


Table 6-2. Sierra Nevada Ecoregion Section: Estimated Impacts on Species of Mitigation Need, by Transportation Project Delivery Year

Expected Advertisement Year	California Red-legged Frog: Number of Transportation Projects	California Red-legged Frog: Estimated Potential Impacts (acres)	Foothill Yellow-legged Frog: Number of Transportation Projects	Foothill Yellow-legged Frog: Estimated Potential Impacts (acres)	Giant Garter Snake: Number of Transportation Projects	Giant Garter Snake: Estimated Potential Impacts (acres)	Swainson's Hawk: Number of Transportation Projects	Swainson's Hawk: Estimated Potential Impacts (acres)	Valley Elderberry Longhorn Beetle: Number of Transportation Projects	Valley Elderberry Longhorn Beetle: Estimated Potential Impacts (acres)
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2029/30	1	32.2	1	32.2	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
2031/32	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
Total ^a	1	32.2	1	32.2	0	0.0	0	0.0	0	0.0

^a Totals may be different due to rounding.

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

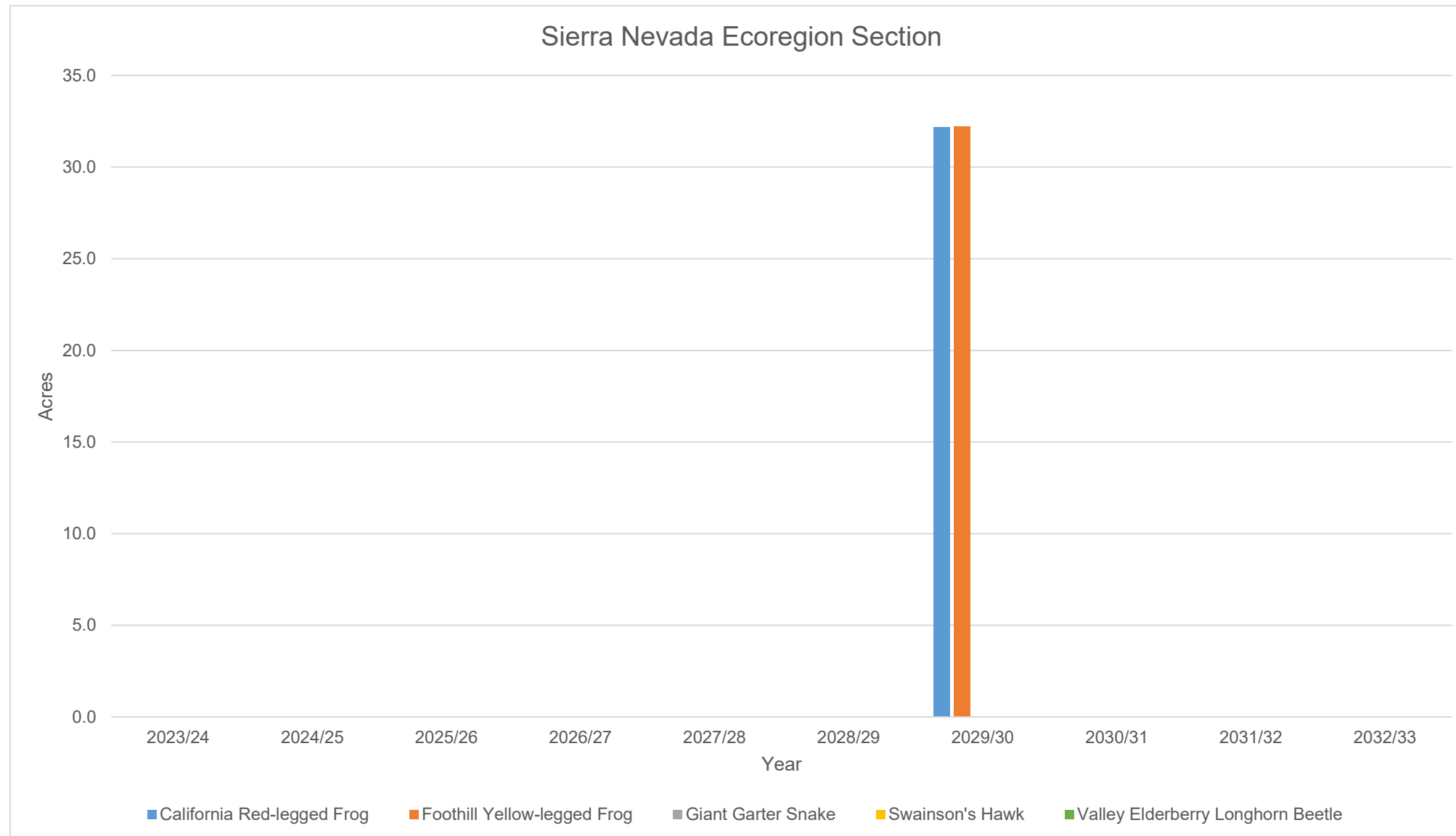


Table 6-3. Sierra Nevada Foothills Ecoregion Section: Estimated Impacts on Species of Mitigation Need, by Transportation Project Delivery Year

Expected Advertisement Year	California Red-legged Frog: Number of Transportation Projects	California Red-legged Frog: Estimated Potential Impacts (acres)	Foothill Yellow- legged Frog: Number of Transportation Projects	Foothill Yellow- legged Frog: Estimated Potential Impacts (acres)	Giant Garter Snake: Number of Transportation Projects	Giant Garter Snake: Estimated Potential Impacts (acres)	Swainson's Hawk: Number of Transportation Projects	Swainson's Hawk: Estimated Potential Impacts (acres)	Valley Elderberry Longhorn Beetle: Number of Transportation Projects	Valley Elderberry Longhorn Beetle: Estimated Potential Impacts (acres)
2023/24	1	0.2	1	0.2	1	0.1	1	0.1	1	0.1
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2027/28	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	1	13.1	1	13.1	0	0.0	0	0.0	1	0.7
2029/30	2	19.4	2	19.4	0	0.0	1	0.9	0	0.0
2030/31	1	7.9	1	7.9	0	0.0	0	0.0	1	<0.1
2031/32	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
Total ^a	5	40.7	5	40.7	1	0.1	2	1.0	3	0.7

^a Totals may be different due to rounding.

Figure 6-4. Sierra Nevada Foothills Ecoregion Section: Estimated Impacts on Species of Mitigation Need, by Transportation Project Delivery Year

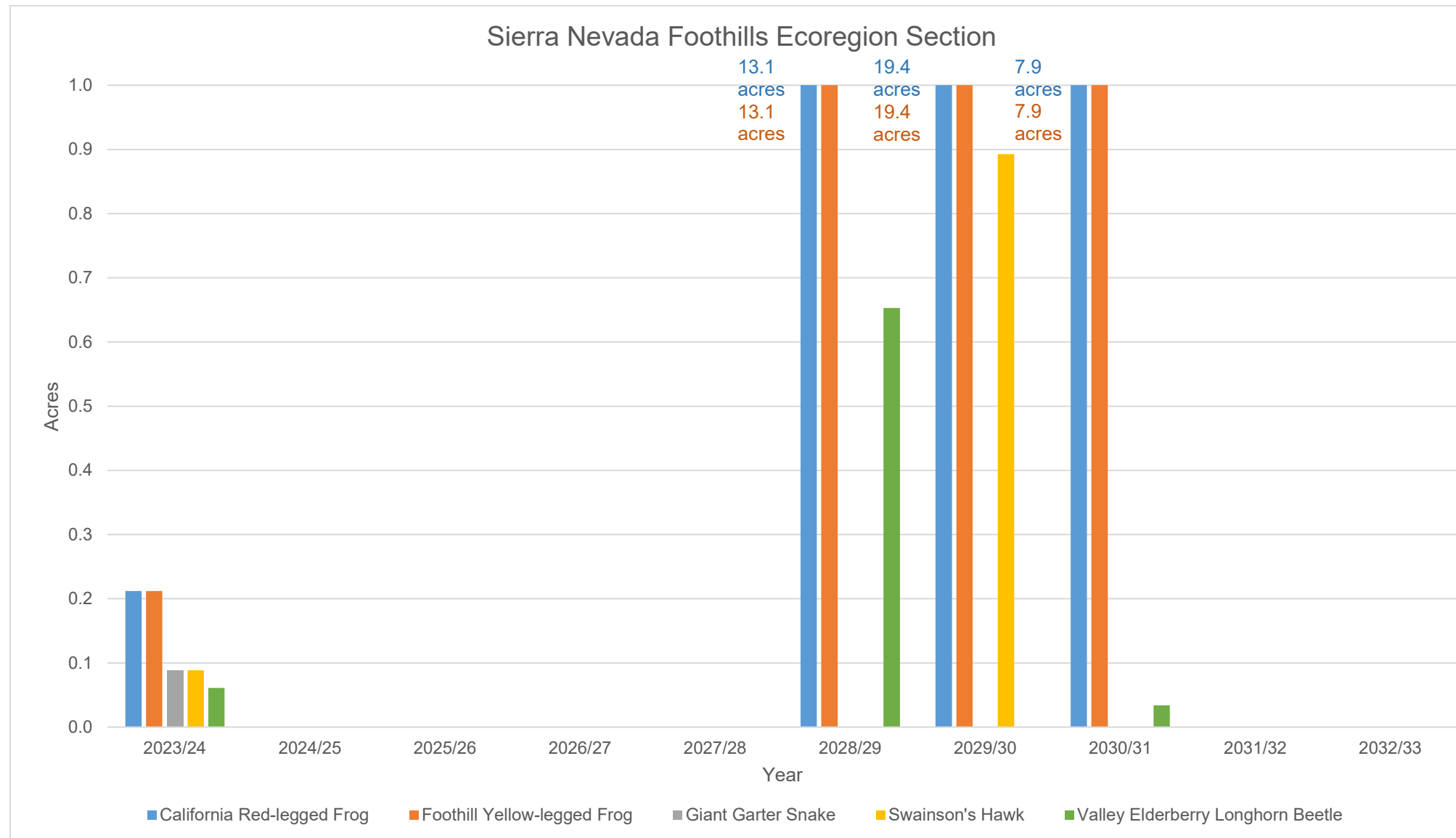


Table 6-4. Upper Cosumnes Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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 Pool: Number of Transportation Projects	Vernal Pool: 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	1	0.2	1	0.1	1	0.3	1	0.0	1.4
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	1	<0.1	1	0.2	1	0.8	1	0.0	0.6
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
2031/32	0	0.0	1	0.1	1	0.2	1	1.4	1	0.0	2.3
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Total^a	0	0.0	3	0.4	3	0.5	3	2.5	3	0.0	4.3

^a Totals may be different due to rounding.

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

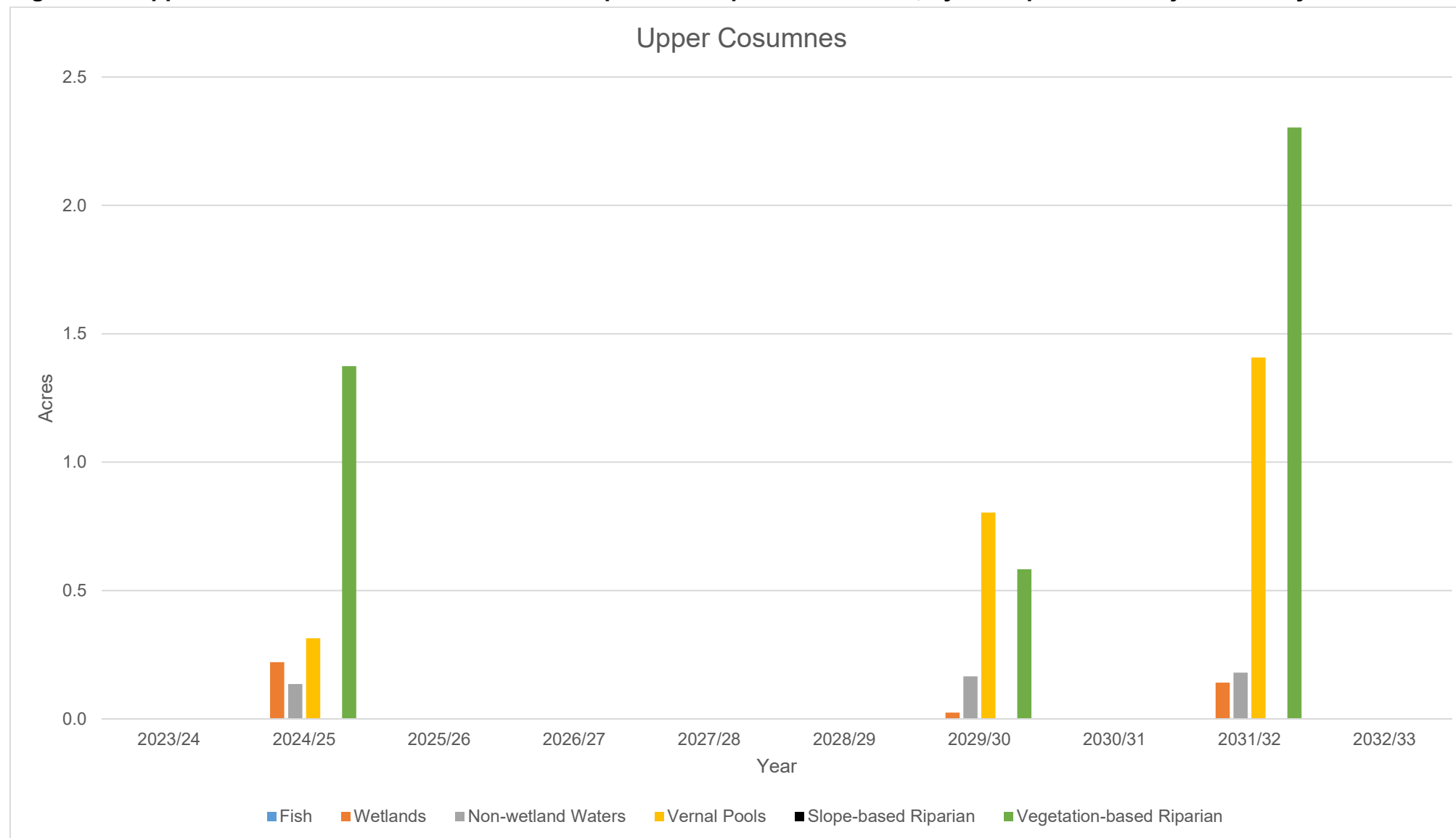


Table 6-5. Upper Mokelumne Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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 Pool: Number of Transportation Projects	Vernal Pool: 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	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	2	0.2	0	0.0	3	0.6	1	0.5	3	<0.1	2.8
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	2.7	0	0.0	1	0.7	11.1
2029/30	1	0.6	1	0.4	1	0.7	1	0.1	1	0.7	13.8
2030/31	0	0.0	0	0.0	1	0.4	1	0.5	2	0.3	2.8
2031/32	0	0.0	0	0.0	1	<0.1	0	0.0	1	0.0	0.3
2032/33	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0.0
Total^a	6	3.6	2	0.7	9	4.5	3	1.1	10	1.7	31.0

^a Totals may be different due to rounding.

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

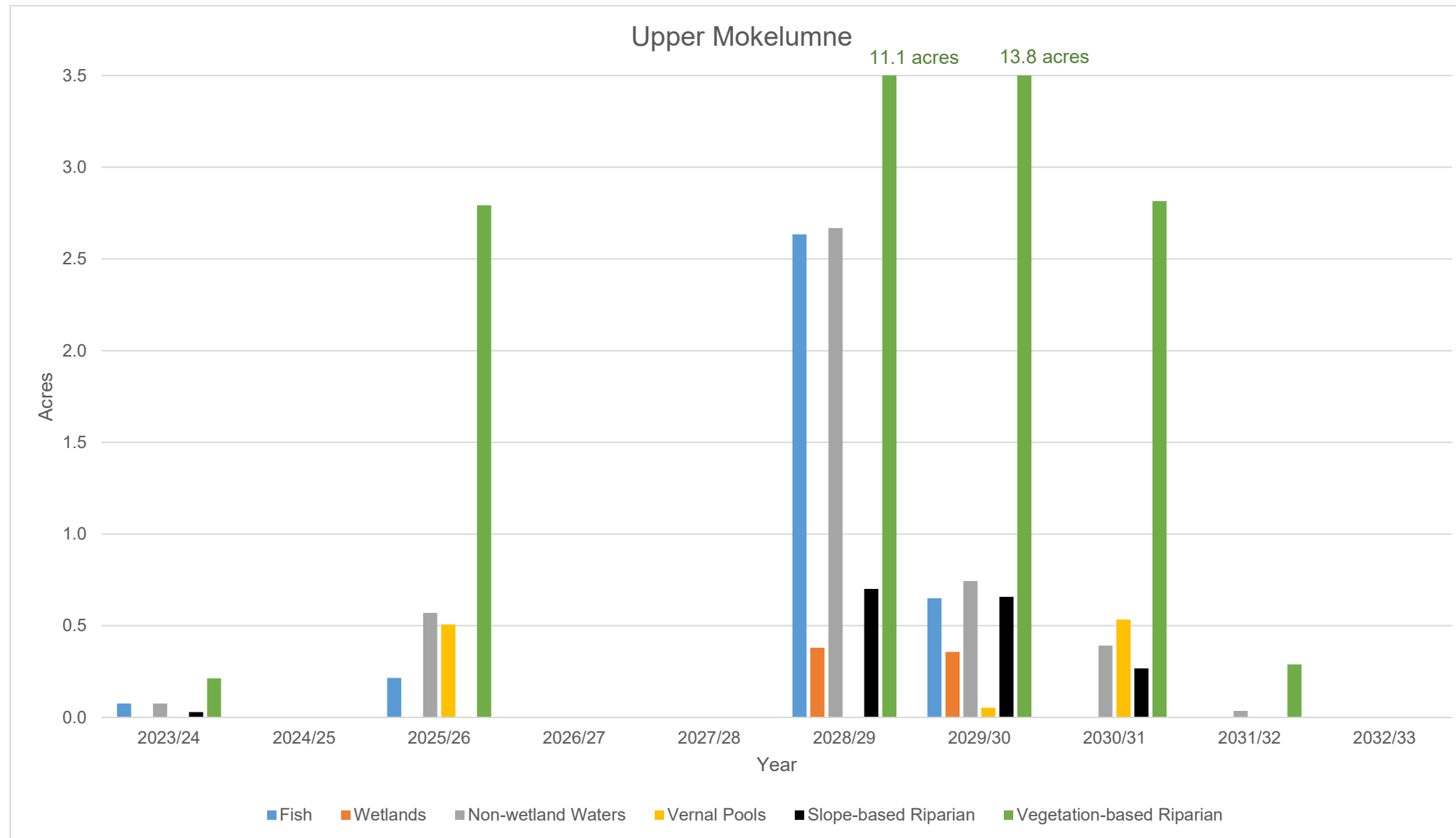
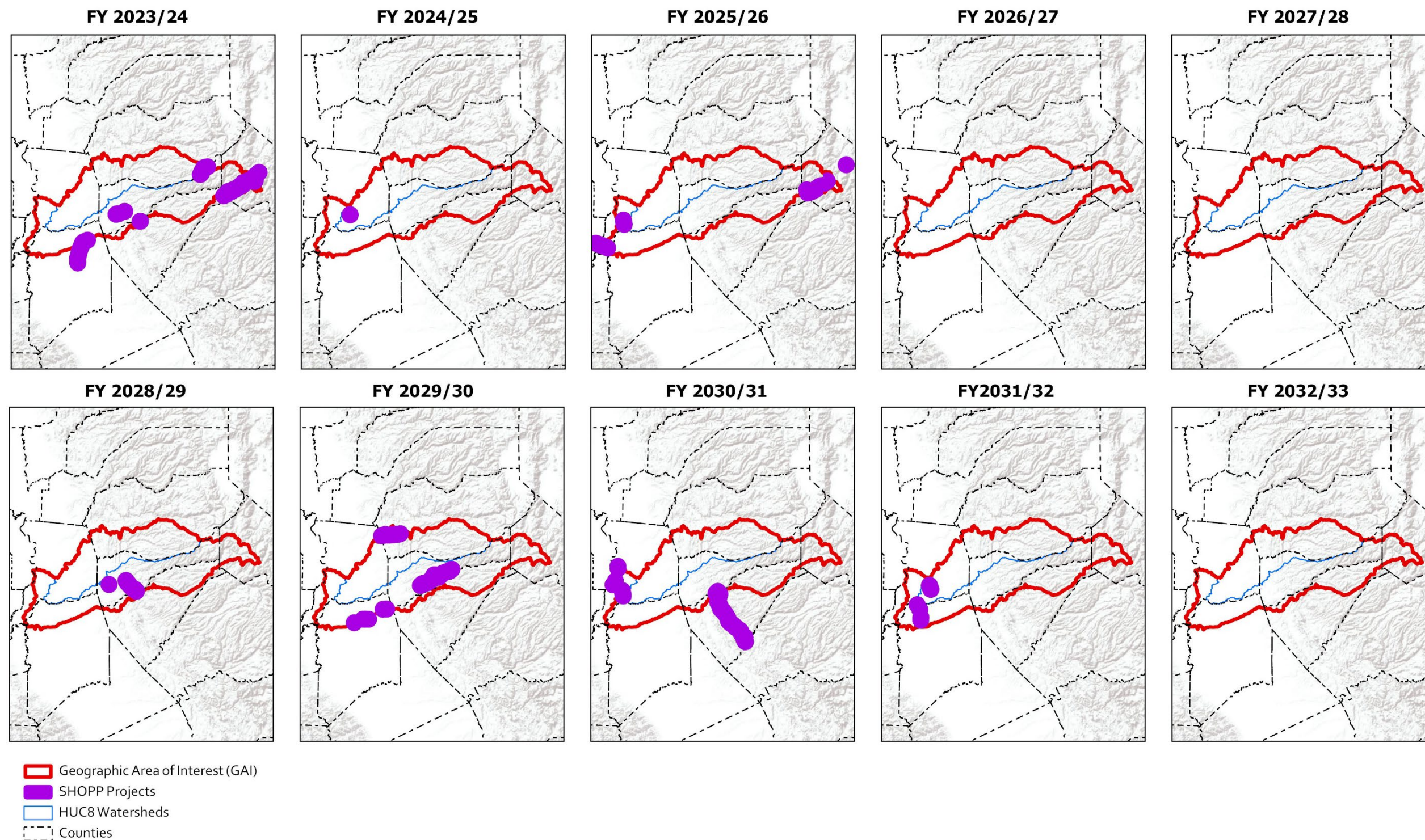


Figure 6-7. Location of SHOPP Estimated Impacts, by Transportation Project Delivery Year



Sources: Esri, USGS, NOAA, USGS

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6.3 Acceleration Priorities

Expressed in the SHS Management Plan, Caltrans District 3's current transportation project priorities consist of transportation projects that generally fall in the beginning and middle of the 10-year project portfolio (Figure 6-7; Caltrans 2023b). Transportation planning is dynamic, however, and delivery schedules associated with transportation projects that informed this RAMNA may change over time. This dynamism will affect Caltrans District 3's needs. For example:

- The impact forecasts presented here are based on the transportation project sequencing provided in the 2023/24 to 2032/33 (Quarter 3) SHOPP Ten-Year Book (Figure 6-7), yet since it was published, the transportation project delivery schedules may have changed, or the projects have been discontinued.
- The 2023 SHS Management Plan gave Caltrans District 3 targets and funding for 408 lane miles of fair (Class 1) pavement. In other words, at this time, Caltrans District 3's priorities are to develop projects that upgrade its 408 lane miles of roadways from fair condition to good condition.

Prior to proposing advance mitigation projects, Caltrans District 3 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 can be applied to advance mitigation projects undertaken in the GAI to offset forecast impacts on wildlife resources from SHOPP transportation projects.

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

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

7.1 Approach

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

To determine the wildlife resource conservation goals and objectives applicable to the GAI:

- First, in Section 7.2, Caltrans identifies the natural resource regulatory agencies with the authority to condition transportation projects with natural resource-related compensatory mitigation in the GAI.

- Then, in Section 7.3, Caltrans summarizes the life history information for the five 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, Caltrans identifies:
 - federal and state binding and non-binding regional conservation and land management plans,
 - current and projected pressures and stressors for which there is a potential transportation nexus,
 - opportunities to enhance the conservation benefits through advance mitigation projects, and
 - opportunities to benefit other special-status and native wildlife species through advance mitigation.
- Last, Caltrans 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 also 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 Wildlife Resources Oversight

Agency ^a	Summary
CDFW	CDFW oversees the conservation, protection, and management of fish, wildlife, native plants, and the habitats necessary for biologically sustainable populations of those species in California. CDFW's Environmental Review and Permitting, Conservation and Mitigation Banking, NCCP, and RCIS programs implement sections of the FGC, Title 14 of the California Code of Regulations, and Public Resources Code § 21000, et seq. These programs help fulfill CDFW's mission to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values. CDFW issues permits and agreements to project proponents under its authorities including incidental take permits and consistency determinations under the 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. In May 2023, FWS issued a Mitigation Policy that builds upon the guidance in the 1981 Mitigation Policy for recommendations and requirements on mitigating adverse impacts of land and water developments on fish and wildlife, and a FESA Compensatory Mitigation Policy that adopts mitigation principles established in the FWS Mitigation Policy, establishes compensatory mitigation standards, and provides guidance for the application of compensatory mitigation through implementation of the FESA. Conservation banking can assist federal and non-federal participants in the Sections 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.

Agency ^a	Summary
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 essential fish habitat (“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.

^a In addition to the agencies listed above, the RWQCBs may exert jurisdiction over species to the extent that cold freshwater habitat; estuarine habitat; fish spawning; freshwater replenishment; groundwater recharge; migration of aquatic organisms; preservation of areas of biological significance; rare, threatened, or endangered species; spawning, reproduction, and/or early development; warm freshwater habitat; and wildlife habitat beneficial uses exist and would be affected by a project.

7.3 Species of Mitigation Need

An overview of wildlife resources is provided in Chapter 2, *Environmental Setting*. As described in Section 1.5, species of mitigation need were selected to focus the planning effort and to 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, foothill yellow-legged frog, giant garter snake, Swainson’s hawk, and valley elderberry longhorn beetle. 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 an estimated 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. The GAI falls within the Sierra Nevada Foothills and Central Valley and North Coast Range Foothills and Western Sacramento River Valley California red-legged frog Recovery Units (FWS 2002).

Typical aquatic breeding habitat for California red-legged frog includes slow-moving streams, pools within streams, and human-made ponds that can support all the species’ aquatic life stages. 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 (FWS 2010; Hayes and Jennings 1988). Aquatic habitat does not need

to be present every year because California red-legged frogs are known to live 8 to 10 years in the wild (FWS 2010). Non-breeding aquatic and riparian 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 the space needed for foraging and cover to sustain individuals, and are particularly important during drought periods and for dispersal to other breeding habitats (Alvarez 2004; FWS 2010). Upland habitats are also important because they buffer aquatic habitats from degradation and provide space for foraging, sheltering, dispersal, and avoiding predation (FWS 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 (FWS 2010; Jennings and Hayes 1994).

7.3.2. Foothill Yellow-legged Frog

Foothill yellow-legged frog is a stream-dwelling frog species that occurs in California from the Oregon border along the Coast Ranges to the San Gabriel Mountains in Southern California, and along the foothills of the western side of the Sierra Nevada south to the edge of the Tehachapi Mountains (Stebbins and McGinnis 2012). The GAI falls within the range of four foothill yellow-legged frog clades: (1) the Northwest/North Coast clade, (2) the North Feather River and Upper Feather River Watershed clade, (3) the Northeast/Northern Sierra clade, and (4) the East/Southern Sierra clade. Of these, the East/Southern Sierra clade is federally and state-listed as endangered, the Feather River clade is federally and state-listed as threatened, the Northeast/Northern Sierra clade is state-listed as threatened, and the Northwest/North Coast clade is a California species of special concern (CDFW 2019d). 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) occur along the margins of relatively shallow and wide portions of the channel. Metamorphosed individuals use a variety of aquatic habitat types, including pools, riffles, and glides (Thompson et al. 2016).

7.3.3. Giant Garter Snake

Giant garter snake is a federally and state-threatened reptile species. It is endemic to California and formerly ranged throughout much of the Central Valley from as far north as Chico to as far south as Bakersfield. However, the species is now considered extirpated from much of its historical range, including Stanislaus County and everywhere south of Fresno (Stebbins and McGinnis 2012).

Typical habitat for this species includes perennial aquatic habitat such as freshwater marshes and sloughs for foraging, bankside basking areas with nearby emergent vegetation for cover, and upland refugia such as small mammal burrows for extended periods of inactivity. In the absence of their natural habitat, giant garter snakes frequently occupy flooded rice fields, irrigation canals, and ditches that simulate their preferred habitat and have connectivity to upland refugia (FWS 2017b).

Giant garter snakes begin mating shortly after emerging from their overwintering sites. Females bear live young from July through September, and most giant garter snakes have returned to underground refugia by October (Stebbins and McGinnis 2012).

7.3.4. Swainson's Hawk

Swainson's hawk is a state-threatened bird species that nests throughout much of western North America, with an isolated breeding population in California's Central Valley from Shasta County south to Kern County (CDFW 2016c). They are primarily a neotropical migrant species, with most birds spending the winter months in Latin America as far south as Argentina, then returning to California to nest in March and early April. A few individuals remain in California over winter, mostly in the Sacramento-San Joaquin River Delta (CDFW 2019a).

Swainson's hawks nest in mature cottonwood-willow riparian woodland; oak savanna; and large, isolated trees in or on the periphery of agricultural fields. Historically, Swainson's hawks foraged primarily in grasslands and open shrublands in the Central Valley. However, as those habitats have been converted for urban development and agricultural production, Swainson's hawks have increasingly foraged in agricultural fields, especially alfalfa and row crops, and some have taken to nesting in urban areas with agricultural fields nearby, such as in the cities of Davis and Sacramento (England et al. 1995). Orchards and vineyards provide less value as foraging habitat for Swainson's hawks because the dense structure of the vegetation incumbers their ability to stoop on prey. Swainson's hawks mainly prey on small mammals, especially California vole (*Microtus californicus*), and a variety of small birds and insects. They are largely monogamous, forming strong pair bonds, and they also exhibit strong site fidelity, often returning to the same nest tree for many successive seasons (CDFW 2016c).

7.3.5. Valley Elderberry Longhorn Beetle

Valley elderberry longhorn beetle is a federally threatened insect species that is endemic to California, occurring in much of the Central Valley from southern Shasta County to northern Fresno County, including the valley floor and lower foothills up to approximately 500 feet in elevation (FWS 2017c).

Valley elderberry longhorn beetles are entirely dependent on their host plant, elderberry (*Sambucus* spp.), upon which they spend their entire life cycle, most of it developing within the pith of the elderberry stems. Adults are only active on the surface of the shrubs for a 1- to 3-week window between March and July, typically coinciding with the elderberry blooming period (FWS 2017c). During this time, they mate, the females lay their eggs on the leaves of the shrub, and when the larvae hatch, they bore into an elderberry stem where they feed and pupate—a process that can take as long as 2 years (Talley et al. 2006). When pupation is complete, the adult beetle emerges from an exit hole it had previously created in the stem. These exit holes are the most readily observed evidence of the presence of the species.

Valley elderberry longhorn beetles most often occupy elderberry shrubs within riparian woodland habitats, although they are sometimes found in elderberry shrubs that are not

associated with riparian corridors in habitats such as valley oak woodland and annual grassland (FWS 2017c).

7.4 Regional Conservation Efforts

Caltrans' understanding of natural resource regulatory agency conservation goals and objectives is that they are generally designed to protect existing populations and habitat, and include acquiring, protecting, restoring, and/or enhancing habitat and linkages. Several conservation and land management plans listed in Table 3-1, relevant to the species of mitigation need, identify key habitats or designate specific lands or areas to protect for conservation of the species of mitigation need in the GAI. These conservation and land management plans are presented in Table 7-2.

The conservation and land management plans include measures to address specific known, ongoing threats to individuals and populations, which are incorporated into and/or inform the advance mitigation conservation goals and objectives compiled below. Caltrans may also use this information during advance mitigation project scoping to help compensatory mitigation efforts in the GAI align with the goals and objectives of natural resource regulatory agencies that approve mitigation.

7.5 Pressures and Stressors

Pressures and stressors refer to environmental trends or physical, chemical, or biological factors or conditions that affect the species of mitigation need or its habitat. According to the SWAP (CDFW 2015), a pressure is defined as “an anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of the target. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target is likely to be significant.” Additionally, stress is defined in the SWAP as “[a] degraded ecological condition of a target that resulted directly or indirectly from negative impacts of pressures (e.g., habitat fragmentation)” (CDFW 2015). The *Recovery Plan for the California Red-legged Frog* (FWS 2002), *A Status Review of the Foothill Yellow-legged Frog (Rana boylei) in California* (CDFW 2019d), *Recovery Plan for the Giant Garter Snake* (FWS 2017b), *Five Year Status Review for Swainson's Hawk* (CDFW 2016c), and *Revised Recovery Plan for Valley Elderberry Longhorn Beetle* (FWS 2019) refer to these pressures and stressors as threats.

The plans included in Table 7-2 identify multiple pressures and stressors contributing to the decline of the species of mitigation need within their ranges (CDFW 2015, 2016c; FWS 2002, 2017c, 2019). These pressures and stressors were evaluated in relation to the types of effects that could result from transportation projects funded through the SHOPP and could benefit from in-kind compensatory mitigation purchased or established through an advance mitigation project.

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

Document	Reference	Areas of Important Habitat
<i>Special-status Species and Sensitive Habitat Documents</i>	See below	See below
<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 wholly or partially in the GAI: ▪ Sierra Nevada Foothills and Central Valley Recovery Unit: – Feather River Core Area – Yuba River – South Fork Feather River Core Area – Traverse Creek/Middle Fork American River/Rubicon Core Area ▪ North Coast Range Foothills and Western Sacramento River Valley Recovery Unit: – Cottonwood Creek Core Area
<i>California Red-Legged Frog (Rana draytonii) 5-Year Review: Summary and Evaluation</i>	FWS 2022	Identifies range and status of the species in the GAI.
<i>Revised Designation of Critical Habitat for the California Red-legged Frog</i>	FWS 2010	Identifies critical habitat for the California red-legged frog.
<i>A Status Review of the Foothill Yellow-legged Frog (Rana boylei) in California</i>	CDFW 2019d	Identifies six foothill yellow-legged frog clades, including the following that occur in the GAI: ▪ Feather River Clade ▪ Northeast/Northern Sierra Clade ▪ East/Southern Sierra Clade ▪ Northwest/North Coast Clade

Document	Reference	Areas of Important Habitat
<i>Recovery Plan for the Giant Garter Snake</i> (Thamnophis gigas)	FWS 2017b	Identifies giant garter snake Recovery Units, including those wholly or partially in the GAI: ▪ Colusa Basin Recovery Unit ▪ Butte Basin Recovery Unit ▪ Sutter Basin Recovery Unit ▪ American Basin Recovery Unit ▪ Yolo Basin Recovery Unit ▪ Cosumnes-Mokelumne Basin Recovery Unit ▪ Delta Basin Recovery Unit
<i>Giant Garter Snake 5-Year Review</i>	FWS 2020	Identifies protected lands that have known occurrences of giant garter snake.
<i>Five Year Status Review for Swainson's Hawk</i> (Buteo swainsoni)	CDFW 2016c	Identifies breeding range and status of the species in the GAI.
<i>Revised Recovery Plan for Valley Elderberry Longhorn Beetle</i>	FWS 2019	Identifies valley elderberry longhorn beetle Management Units, including those wholly or partially in the GAI: ▪ Sacramento River Management Unit ▪ Putah Creek Management Unit ▪ San Joaquin River Management Unit
<i>Valley Elderberry Longhorn Beetle 5-Year Review</i>	FWS 2006	Identifies the range and status of the species in the GAI.
<i>Valley Elderberry Longhorn Beetle Designation of Critical Habitat</i>	FWS 1980	Identifies critical habitat for the valley elderberry longhorn beetle.

Document	Reference	Areas of Important Habitat
Conservation and Land Management Documents	See below	See below
<i>California Essential Habitat Connectivity Project</i>	Spencer et al. 2010	Identifies Natural Landscape Blocks and Essential Connectivity Areas in a set of defined ecoregions. The GAI overlaps two of these ecoregions: ▪ Central Valley Ecoregion: – Notes that there are very few opportunities for upland connectivity in the Central Valley Ecoregion because of habitat conversion for agricultural and urban uses. Most connectivity opportunities are confined to riparian and riverine areas. ▪ Sierra Nevada Ecoregion: – Prioritizes broad north-to-south linkages over the entire ecoregion. Notes that a north-to-south connection across Interstate 80 at the Bear River is an imperiled wildlife linkage.
<i>Delta Adapts: Creating a Climate Resilient Future</i>	Delta Stewardship Council 2024a	Identifies four ecosystem strategies to strengthen the climate adaptation potential of Delta ecosystems: ▪ improve the capacity of ecosystems and native species to adapt to and thrive under future conditions; ▪ protect at-risk ecosystems by halting and reversing subsidence, and reducing the risk of levee failures; ▪ build capacity and coordination to improve ecosystem function and resilience; and ▪ protect and enhance urban ecosystems and use nature-based solutions to increase climate resilience of urban areas in and near the Delta and Suisun Marsh.
<i>The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value</i>	Delta Stewardship Council 2024b	Makes policies and recommendations for restoring the Delta ecosystem, including the following core strategies: ▪ create more natural functional Delta flows ▪ restore habitat ▪ improve water quality to protect the ecosystem ▪ prevent introduction of and manage nonnative species impacts ▪ improve hatcheries and harvest management More details are provided in Chapter 4 of the plan.
<i>Mokelumne Watershed Master Plan</i>	East Bay Municipal Utility District 2008	A strategic plan to manage the watershed of the Mokelumne River. Includes policies to control invasive species, support the recovery of endangered species, and increase the health of riparian habitats.

Document	Reference	Areas of Important Habitat
<i>Cosumnes, American, Bear, and Yuba River Integrated Regional Water Management Plan</i>	Cosumnes, American, Bear, and Yuba River Regional Water Management Group 2021	Identifies California red-legged frogs and foothill yellow-legged frogs as present in the watershed, and identifies the following management actions: ▪ For foothill yellow-legged frogs, remove trout and bullfrogs in 18 acres of high mountain lakes at locations where these frogs can recolonize. ▪ For California red-legged frogs, create 1 acre of pond habitat by 2025 where existing California red-legged frogs reside downstream and have the potential to colonize the new pond habitat.
<i>Prairie City State Vehicular Recreational General Plan</i>	California State Parks 2022	Swainson's hawk is known to occur and valley elderberry longhorn beetle has the potential to occur in the plan area. Includes policies to attain no net loss of wetlands, provide for compensatory mitigation of wetlands and riparian habitats, manage invasive species, and avoid work within 100 feet of elderberry shrubs or 0.25 mile of nesting Swainson's hawks.
<i>Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update</i>	Upper Mokelumne River Watershed Authority 2024	Management plan for watershed resources planning. All target species have the potential to occur within the plan area. Includes policies to restore habitat along the Mokelumne River and remove invasive species.
<i>Sacramento River National Wildlife Refuge Final Comprehensive Conservation Plan</i>	FWS 2005b	FWS' conservation plan for the Sacramento River National Wildlife Refuge. The refuge is known to have occurrences of valley elderberry longhorn beetle, giant garter snake, and Swainson's hawk. Includes goals to: ▪ Restore 3,255 acres of riparian vegetation and upland habitats with the following habitat types as targets: great valley willow scrub; great valley cottonwood forest; great valley mixed riparian forest; great valley oak riparian forest; valley oak savannah; elderberry savanna; and grassland, herbland, and wetland. Specific acreages and areas of restoration are detailed in Table 9 of the document. ▪ Target the following refuge units for invasive species control: Pine Creek, Phelan Island, Capay, La Barranca, Drumheller Slough, Flynn, and Rio Vista.
<i>Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan</i>	FWS 2007	FWS' conservation plan for Stone Lakes National Wildlife Refuge. The refuge is known to have occurrences of Swainson's hawk and giant garter snake. Includes goals to: ▪ Establish 65 acres of valley foothill riparian and oak woodland habitat by restoring and expanding cottonwood riparian forest habitat along the south arm of North Stone Lake, expanding the riparian zone to a range of 150 to 400 feet wide along the Sacramento Drainage Canal, and removing perennial pepperweed in riparian areas. ▪ Enhance 50 acres of seasonal and permanent wetlands in the South Stone Lake Unit. ▪ Maintain 715 acres of deep-water aquatic habitats for giant garter snake.

Document	Reference	Areas of Important Habitat
SWAP	CDFW 2015	The GAI overlaps three of the SWAP's defined geographic provinces: ▪ Central Valley and Sierra Nevada Province: – In the Central Valley and Sierra Nevada Province, all of the species of mitigation need (California red-legged frog, foothill yellow-legged frog, giant garter snake, Swainson's hawk, and valley elderberry longhorn beetle) are considered Species of Greatest Conservation Need. ▪ North Coast and Klamath Province: – In the North Coast and Klamath Province, California red-legged frog and foothill yellow-legged frog are considered Species of Greatest Conservation Need. ▪ Cascades and Modoc Plateau Province: – In the Cascades and Modoc Plateau Province, foothill yellow-legged frog is considered a Species of Greatest Conservation Need. ▪ The SWAP defines a broad target of increasing the acreage of specific vegetation types and habitats available to focal species by 5 percent over their 2015 levels by 2025.
<i>Ukiah Resource Management Plan</i>	BLM 2006	BLM's resource management plan for the area within the Ukiah Field Office's jurisdiction. Includes a general goal to inventory valley elderberry longhorn beetle populations and implement management actions consistent with the species' FWS Recovery Plan.
<i>Forest Plan Direction</i>	USDA 2017	Updated land and resource management plan for Stanislaus National Forest. Includes policies to restore special aquatic features, prevent and control the spread of invasive plant species, and mitigate impacts on listed species.
<i>Yolo Regional Conservation Investment Strategy/Local Conservation Plan ("RCIS/LCP")</i>	Yolo Habitat Conservancy 2020	Identifies conservation goals and objectives and conservation priorities to guide and coordinate future conservation actions throughout Yolo County. Focal species include giant garter snake, Swainson's hawk, and valley elderberry longhorn beetle.
<i>East Bay Regional Conservation Investment Strategy</i>	California State Coastal Conservancy 2021	Identifies conservation goals and objectives and conservation priorities to guide and coordinate future conservation actions throughout Alameda and Contra Costa Counties. Focal species include California red-legged frog, foothill yellow-legged frog, giant garter snake, and Swainson's hawk.

Document	Reference	Areas of Important Habitat
County and City General Plans	See below	See below
<i>Alpine County General Plan</i>	Alpine County 2003	Includes policies protecting wetlands from vegetation removal and protecting critical habitat of any listed species.
<i>Amador County General Plan</i>	Amador County 2016	Identifies open space land use policies to protect wildlife movement corridors, support conservation easements, use native species for revegetation, and protect special-status species.
<i>Calaveras County General Plan</i>	Calaveras County 2019	Includes policies to avoid impacts or mitigate impacts on special-status species habitat and riparian/wetland habitat, protect riparian corridors, protect wildlife dispersal corridors, and eradicate invasive species.
<i>El Dorado County General Plan</i>	El Dorado County 2017	Includes policies to protect wetlands, vernal pools, and riparian areas because of their habitat value. Encourages the inclusion of wetlands and riparian areas into conservation easements, eradication of invasive plants, protection of wildlife corridors, and adoption of a mitigation program.
<i>City of Galt General Plan</i>	City of Galt 2005	Valley elderberry longhorn beetle, foothill yellow-legged frog, giant garter snake, and Swainson's hawk are known to occur in the plan area. Includes policies to protect and improve riparian corridors, require mitigation for impacts to vernal pools, and restore wetlands.
<i>City of Lone General Plan</i>	City of lone 2009	California red-legged frog and Swainson's hawk occur in the plan area. Includes policies to protect significant habitats and wildlife corridors, require mitigation for impacts to special-status species that emphasizes a multispecies approach, maintain wetland and creek corridors, and require wetland setbacks.
<i>City of Isleton 2040 General Plan</i>	City of Isleton 2022	Includes policies to establish buffers around ecologically sensitive habitats, protect Swainson's hawk nests, protect migration routes, and enhance habitat through riparian restoration.
<i>Lodi General Plan</i>	City of Lodi 2010	Includes policies to protect and restore wildlife along the Mokelumne River, eradicate invasive plants, protect riparian vegetation, support establishment of new enhancement areas, mitigate for impacts to Swainson's hawk and vernal pool tadpole shrimp, and establish mitigation banks.
<i>Plymouth General Plan</i>	City of Plymouth 2017	Includes policies that require preservation of sensitive habitats, wetland mitigation, and riparian buffers.

Document	Reference	Areas of Important Habitat
<i>Rancho Cordova General Plan</i>	City of Rancho Cordova 2006	Identifies valley elderberry longhorn beetle and Swainson's hawk as occurring within the city planning area: ▪ Requires the conservation of Swainson's hawk habitat, including the establishment of a Swainson's Hawk Ordinance, where loss of habitat will be mitigated by permanent protection of equivalent or better existing habitat conditions. ▪ Includes a measure requiring mitigation of impacts on any special-status species in coordination with CDFW and FWS to ensure that projects do not contribute to the decline of the affected species populations in the region to the extent that their decline would affect the viability of the regional population.
<i>Sacramento County General Plan</i>	Sacramento County 2010	Includes a policy to protect non-oak native trees in riparian areas that are used by Swainson's hawks.
<i>San Joaquin County General Plan 2035</i>	San Joaquin County 2016	California red-legged frog occurs in the plan area. Policies protect sensitive areas such as wetlands, riparian areas, and vernal pools.
<i>Sutter Creek General Plan</i>	City of Sutter Creek 2019	Includes policies that require mitigation for impacts to wetlands and riparian areas. Includes a Wildlife Habitat Management Plan that has best management practices for valley elderberry longhorn beetle, amphibians, and nesting birds.
<i>Yolo County General Plan</i>	Yolo County 2009	Includes a policy that projects that would affect Swainson's hawk foraging habitat must participate in the <i>Agreement Regarding Mitigation for Impacts to Swainson's Hawk Foraging Habitat in Yolo County</i> , entered into by CDFW and the Yolo County HCP/NCCP Joint Powers Agency, or satisfy other subsequent adopted mitigation requirements consistent with applicable local, state, and federal requirements.

7.5.1. Habitat Loss, Fragmentation, and Degradation

Urbanization and other anthropogenic factors such as roads, poor grazing practices, and habitat invasion by nonnative species have led to the loss and degradation of existing habitat for all species of mitigation need. Additionally, roads and urbanization have resulted in habitat fragmentation and a decrease in connectivity between habitats that support species of mitigation need populations, as well as increased mortality of the species from vehicle strikes.

Roads and highways hinder the movement of California red-legged frogs, foothill yellow-legged frogs, and giant garter snakes, and are considered permanent physical barriers leading to increased habitat fragmentation and isolation of populations (CDFW 2019d; FWS 2002, 2020). 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). The effects of traffic noise and vibrations on vertebrates include hearing loss, increase in stress hormones, altered behaviors, and interference with communication during breeding activities (Forman and Alexander 1998). Roads near aquatic habitats that are poorly constructed or inadequately maintained may lead to increased erosion, sedimentation, and petrochemical runoff, negatively affecting amphibian populations (CDFW 2019d), including California red-legged frog and foothill yellow-legged frog. Culverts under roads may provide some connectivity for various species, but if not constructed properly they also can impede dispersal and trap some species such as foothill yellow-legged frog (CDFW 2019d).

Conversion of agricultural fields to urbanization is seen as a significant threat to Swainson's hawks, which extensively use farm fields as foraging habitat. Swainson's hawks frequently use lone trees along roadsides near suitable foraging areas for nesting, and loss of these types of trees due to road maintenance activities would negatively affect breeding habitat availability for the species (CDFW 2016c).

Conversion of riparian areas and isolation of remaining habitat patches are considered to be significant ongoing threats to valley elderberry longhorn beetle. Because the species has limited dispersal capabilities, roads and highways are believed to be major barriers constraining the species' ability to move between areas of suitable habitat (FWS 2019).

7.5.2. Invasive Species

Transportation projects and associated ongoing maintenance activities have the potential to introduce and/or spread nonnative, invasive species. The entry of invasive, nonnative species into an ecosystem may reduce biodiversity, degrade habitats, alter genetic diversity, shift habitat type, and further threaten already endangered or threatened natural resources.

Introduced fish, crayfish, and bullfrogs are known to predate all life stages of California red-legged frog (FWS 2002) and foothill yellow-legged frog (CDFW 2019d). The effects of invasive plant species on habitat values for the species of mitigation need are not fully

understood, although species such as giant reed (*Arundo donax*) and cape ivy (*Delairea odorata*) may alter the structure of native riparian habitat and decrease available surface water for California red-legged frog (FWS 2002).

Introduced fish, crayfish, and bullfrogs are also known to predate and compete with giant garter snakes. In addition, giant garter snakes face competition from introduced water snakes (*Nerodia* sp.), which have recently established populations in some Central Valley waterways (FWS 2017b). Invasive plant species such as water hyacinth (*Eichornia* sp.) and water-primrose (*Ludwigia* sp.) may have both negative and positive effects on giant garter snakes, choking out open water and thereby reducing edge habitats that are preferred as foraging areas, while simultaneously providing them with cover for basking and predator avoidance (FWS 2020).

Invasive species are not thought to be a significant threat to Swainson's hawks. In fact, they often build nests in invasive nonnative eucalyptus trees (CDFW 2016c).

Valley elderberry longhorn beetles may be negatively affected by Argentine ants (*Linepithema humile*), a widespread invasive species, which have been documented predated the beetle's eggs and larvae. Argentine ants are known to occur in several areas occupied by valley elderberry longhorn beetles (FWS 2019). Impacts from invasive plant species are largely unknown, although the increasing prevalence of nonnative plants in California ecosystems is expected to have negative impacts on native elderberry populations, which are the beetle's obligate host plants (FWS 2014).

7.5.3. Disease and Predation

Disease and predation rates can be affected by habitat loss, fragmentation, and degradation, described in Section 7.5.1. California red-legged frogs and foothill yellow-legged frogs may be affected by chytridiomycosis, a disease caused by a fungal pathogen called chytrid. Although the effects of chytrid on California red-legged frogs and foothill yellow-legged frogs are not well understood, it is known to have caused mass mortality and population declines in other amphibian species (CDFW 2019d; FWS 2002). Giant garter snakes may be susceptible to snake fungal disease, an emerging disease caused by the fungal pathogen, *Ophidiomyces ophidiicola*. This disease has only recently been documented in California and may be spread by invasive water snakes (FWS 2020). Swainson's hawks have been documented suffering mortality from West Nile virus, although relatively few cases have been confirmed and the disease has not been implicated in any population declines (CDFW 2016c). Disease is not thought to be a significant threat to valley elderberry longhorn beetles.

Predation is considered a major threat to several of the species of mitigation need in the GAI. As noted above, California red-legged frogs, foothill yellow-legged frogs, and giant garter snakes are all susceptible to predation from invasive species, including bullfrogs, crayfish, and nonnative fish (CDFW 2019d; FWS 2002, 2017b). Valley elderberry longhorn beetles face predation risks from invasive Argentine ants, which may prey on eggs and larvae (FWS 2019), as mentioned above. Predation is not thought to be threat to Swainson's hawks.

7.5.4. Climate Change, Drought, Wildfire, and Sea Level Rise

Section 2.4 provided a brief overview of the GAI's climate and available planning-level predictions for climate change and sea level rise 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 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).

The lower permeability of roads can exacerbate the risks associated with flooding and erosion. Terrestrial connectivity in the GAI is shown on Figure 2-8. Areas with higher rankings are expected to provide opportunities for the species of mitigation need to respond to climate change stress by preserving large blocks of habitat and linkage areas that will allow migration toward more suitable habitat as the climate changes, and by providing protection for the ecological processes that support key habitat. The terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a) is presented on Figure 2-5. Climate resilience is low throughout the floor of the Central Valley, with much of the area having a rank of only 1 or 2, or having no data. It is in these low-elevation locations that impacts from climate change are expected to be the most severe in the GAI. Projected climate resilience increases with elevation on the mountainous eastern and western edges of the GAI, reaching rankings of 4 or 5 near the highest peaks.

Large populations of California red-legged frog can survive stochastic events such as fires, floods, or drought; however, many populations are small and isolated because of habitat loss and other stressors. These smaller and more vulnerable populations are in danger of extirpation because of climate change. Shorter hydroperiods in aquatic habitats during droughts have the potential to prevent successful reproduction by not allowing sufficient time for larval metamorphosis. Local extirpations could occur if extended periods of drought prevent successful reproduction for several sequential years. However, differing life history traits of invasive species such as bullfrogs may be more affected by drought, thus providing a beneficial scenario for the survival of California red-legged frog that may subsist (FWS 2002).

Increased variability and changes in the type, magnitude, and timing of precipitation suggested by climate change models will result in more variable and extreme flows in river systems that support foothill yellow-legged frog (CDFW 2019d). This has the potential to increase the likelihood of egg mass scouring and tadpole stranding. The magnitude and nature of these effects will vary regionally and locally based on several underlying factors. For example, given the projected increase in temperatures, a correlating reduction in seasonal snowpack is expected. Such a reduction could disrupt the timing and duration of peak stream flows, which could result in increased sedimentation and other negative effects on foothill yellow-legged frog breeding habitat. Foothill yellow-legged frog populations in the GAI associated with stream and river systems of the Sierra Nevada foothills would be particularly susceptible to this type of climate change effect. Furthermore, the northern Sierra (Feather, Yuba, and American

River watersheds) is expected to experience more severe impacts from the reduction in snowmelt than southern parts of the foothill yellow-legged frog's range (CDFW 2019d).

Potential effects of climate change on giant garter snake remain under-studied, although longer and more extreme droughts will likely have negative impacts on the species because of its highly aquatic nature. Less available water will decrease habitat availability and suitability, and has the potential to exacerbate other pressures and stressors affecting giant garter snake populations (FWS 2020).

The more extreme weather events predicted by climate change models may affect Swainson's hawks through increased winter flooding, potentially affecting riparian habitats, and sea level rise inundating low-lying nesting and foraging habitats, especially in the low-lying Delta portions of the GAI. Decreased water availability also has the potential to incentivize the Central Valley agriculture industry to shift away from crops providing suitable foraging habitat such as alfalfa or crops that require less water but are lower-quality foraging habitats. A widespread shift away from low-growing crops to taller-stature crops and trees would likely cause significant impacts on Swainson's hawk populations because they require shorter vegetation for effective foraging (CDFW 2016c).

Potential impacts on valley elderberry longhorn beetles from climate change are difficult to predict and quantify. However, available models broadly indicate that climate change will have negative effects on available habitat for the species throughout its range (FWS 2014).

7.5.5. Contaminants

Pollutants have been associated with roads and industrial activity. Petroleum products from roadside runoff, pesticides, herbicides, mineral fertilizers, industrial chemicals, and airborne pollutants are known to have negative effects on amphibians. Amphibians are especially susceptible to contaminants in their environment because of their highly permeable skin. California-red legged frog is especially affected by aqueous pesticides because of the many life stages that take place within aquatic environments (FWS 2002). Foothill yellow-legged frogs are also highly susceptible to toxicity from herbicides and pesticides (CDFW 2019d). Contaminants are not thought to be a significant threat to giant garter snakes (FWS 2017b).

Mass mortality of Swainson's hawks as a result of organophosphate and carbamide pesticide toxicity has been documented near agricultural fields in Argentina, which is the southern extent of the species' migratory range. Such mass mortality events have not been documented in California, although this does demonstrate that pesticides can have severe impacts if not regulated properly (CDFW 2016c). Anticoagulant rodenticides are widely used in agricultural areas where Swainson's hawks forage and may cause secondary toxicity through ingestion of poisoned prey. CDFW's Wildlife Investigations Laboratory has documented at least one case of direct mortality of a Swainson's hawk in California attributable to anticoagulant rodenticide toxicity, although this does not appear to be a major source of impacts on the species (CDFW 2016c).

While the specific effects of contaminants on valley elderberry longhorn beetles have not been well-studied, it is likely that they are susceptible to impacts from drift of broad-spectrum pesticides near habitats that they are occupying (FWS 2014). Areas where pesticides are in use may also function as dispersal barriers if they are located between patches of suitable elderberry shrub habitat (FWS 2019).

7.6 Multi-species Benefits

While the species of mitigation need identified for this GAI are California red-legged frog, foothill yellow-legged frog, giant garter snake, Swainson's hawk, and valley elderberry longhorn beetle, several other special-status species share habitat with these species, which may be addressed under CDFW's Lake and Streambed Alteration Agreement program. These species include, but are not limited to:

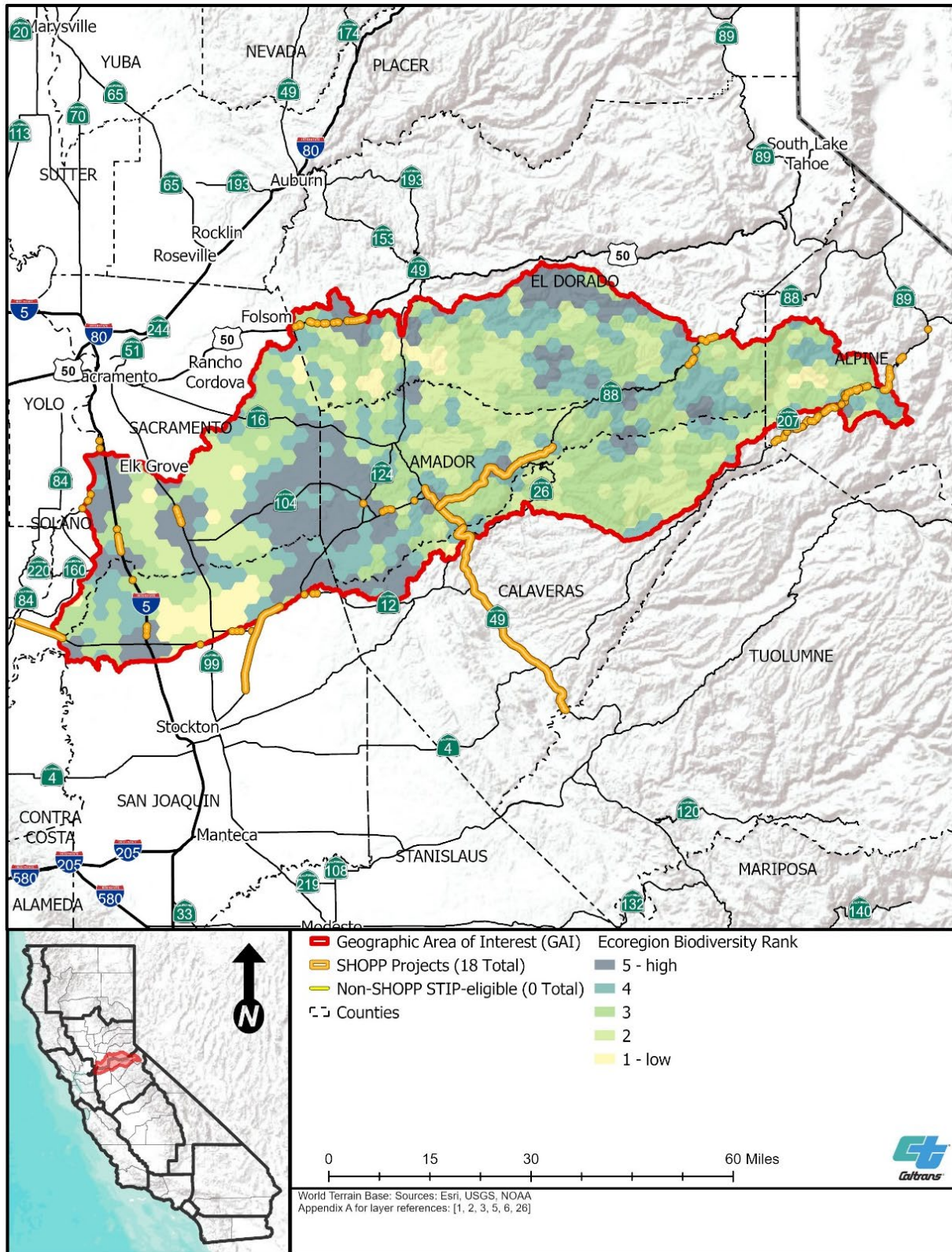
- Blainville's horned lizard (*Phrynosoma blainvillii*)
- tricolored blackbird (*Agelaius tricolor*)
- American badger (*Taxidea taxus*)

A complete list of co-benefiting species based on forecast impacts from the SAMNA model is included in Tables 5-3 to 5-5.

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

As described in Chapter 4, *Existing Mitigation Opportunities*, one HCP that covers multiple species occurs in the GAI. While the primary purpose of the plan is to benefit the covered species addressed in each plan through acquisition, protection, and restoration of covered species habitat, these actions will benefit a variety of species that utilize these habitats. It is likely that any Caltrans mitigation requirements that are addressed through these plans will also provide benefits to other co-occurring species in addition to the covered species.

Figure 7-1. Terrestrial Biodiversity in the GAI



Other efforts, such as planting Caltrans easements with species beneficial to pollinators, are expected to contribute to biodiversity protection and enhancement in the GAI. In addition, planting native plants in Caltrans easements enhances biodiversity by reducing invasive species cover. The installation of culvert ramps and fence jump-outs to facilitate safe movement across highways would also benefit numerous terrestrial wildlife species. Advance mitigation purchased or established to address anticipated impacts on species of mitigation need may also provide mitigation to compensate for impacts on these other species. Caltrans will consider the special-status species with the potential to co-occur in covered species habitats in order to inform advance mitigation scoping and thereby improve the conservation benefits of mitigation in the GAI.

7.7 Advance Mitigation Conservation Goals and Objectives

The conservation goals and objectives compiled in Table 7-3 are intended to be relevant to anticipated future SHOPP transportation project mitigation needs, be consistent with the goals and objectives of natural resource regulatory agencies for the species of mitigation need, address pressures and stressors, and support species of mitigation need population recovery and success in the GAI. Each conservation goal is supported by one or more conservation objectives and is meant to further guide Caltrans District 3 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 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 the species of mitigation need in the GAI. Sub-objectives also capture specific measures from conservation and land management plans that address threats to the species of mitigation need. 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.

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

Objective	Sub-Objective	Affected Species ^a	Alignment with Conservation and Management Plans ^b
Goal WILD-1: Conserve and expand habitat for species of mitigation need 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 the species of mitigation need is provided, including consolidating compensatory mitigation. Sub-Objective WILD-1.1.2: Prioritize key areas, such as designated critical habitat, movement corridors, and buffer zones. Sub-Objective WILD-1.1.3: Prioritize acquisition and/or protection of large blocks of suitable, occupied habitat for the species of mitigation need; lands adjacent to occupied habitat; and/or land that expands or buffers existing occupied protected habitats. Sub-Objective WILD-1.1.4: Prioritize land acquisition and/or protection that supports key populations.^c Sub-Objective WILD-1.1.5: Prioritize acquisition, protection, and/or enhancement of SWAP (CDFW 2015) conservation targets: wet mountain meadow, western upland grasslands, salt marsh, Pacific Northwest subalpine forest, north coastal mixed evergreen and montane conifer forests, north coastal and montane riparian forest and woodland, montane chaparral, freshwater marsh, chaparral, California grassland and flowerfields, California foothill and valley forests and woodlands, California foothill and coastal rock outcrop vegetation, American southwest riparian forest and woodland, and alpine vegetation (Figure 7-2) that coincide with the species of mitigation need range, as well as other locally or regionally important habitat types. Sub-Objective WILD-1.1.6: Create, enhance, or restore breeding habitat in protected areas where it is limited.^c	- California red-legged frog - foothill yellow-legged frog - giant garter snake - Swainson’s hawk - valley elderberry longhorn beetle	- SWAP (CDFW 2015) and companion plans (CDFW 2016a, 2016b) - CEHC (Spencer et al. 2010) - Delta Adapts: Creating a Climate Resilient Future (Delta Stewardship Council 2024a) - The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value (Delta Stewardship Council 2024b) - Recovery Plan for the California Red-legged Frog (Rana aurora draytonii) (FWS 2002) - Considerations for Conserving the Foothill Yellow-Legged Frog (CDFW 2018c) - A Status Review of the Foothill Yellow-legged Frog (Rana boylei) in California (CDFW 2019d) - Recovery Plan for the Giant Garter Snake (Thamnophis gigas) (FWS 2017b) - Giant Garter Snake 5-Year Review (FWS 2020) - Five Year Status Review for Swainson’s Hawk (Buteo swainsoni) (CDFW 2016c) - Staff Report Regarding Mitigation for Impacts to Swainson’s Hawks (Buteo swainsoni) in the Central Valley of California (California Department of Fish and Game 1994) - Revised Recovery Plan for Valley Elderberry Longhorn Beetle (FWS 2019) - Valley Elderberry Longhorn Beetle 5-Year Review (FWS 2006) - Cosumnes, American, Bear, and Yuba River Integrated Regional Water Management Plan (Cosumnes, American, Bear, and Yuba River Regional Water Management Group 2021) - Forest Plan Direction (USDA 2017) - Mokelumne Watershed Master Plan (East Bay Municipal Utility District 2008) - Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update (Upper Mokelumne River Watershed Authority 2024) - Sacramento River National Wildlife Refuge Final Comprehensive Conservation Plan (FWS 2005b) - Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan (FWS 2007) - Prairie City State Vehicular Recreation Area General Plan (California State Parks 2022) - City of Lone General Plan (City of Lone 2009) - City of Isleton General Plan (City of Isleton 2024) - City of Galt General Plan (City of Galt 2009) - Rancho Cordova General Plan (City of Rancho Cordova 2006) - Alpine County General Plan (Alpine County 2003) - Amador County General Plan (Amador County 2016) - Calaveras County General Plan (Calaveras County 2019) - El Dorado County General Plan (El Dorado County 2017) - Lodi General Plan (City of Lodi 2010) - Plymouth General Plan (City of Plymouth 2013) - Sacramento County General Plan (Sacramento County 2010) - San Joaquin County General Plan (San Joaquin County 2016) - Sutter Creek General Plan (City of Sutter Creek 2019) - Yolo RCIS/LCP (Yolo Habitat Conservancy 2020)

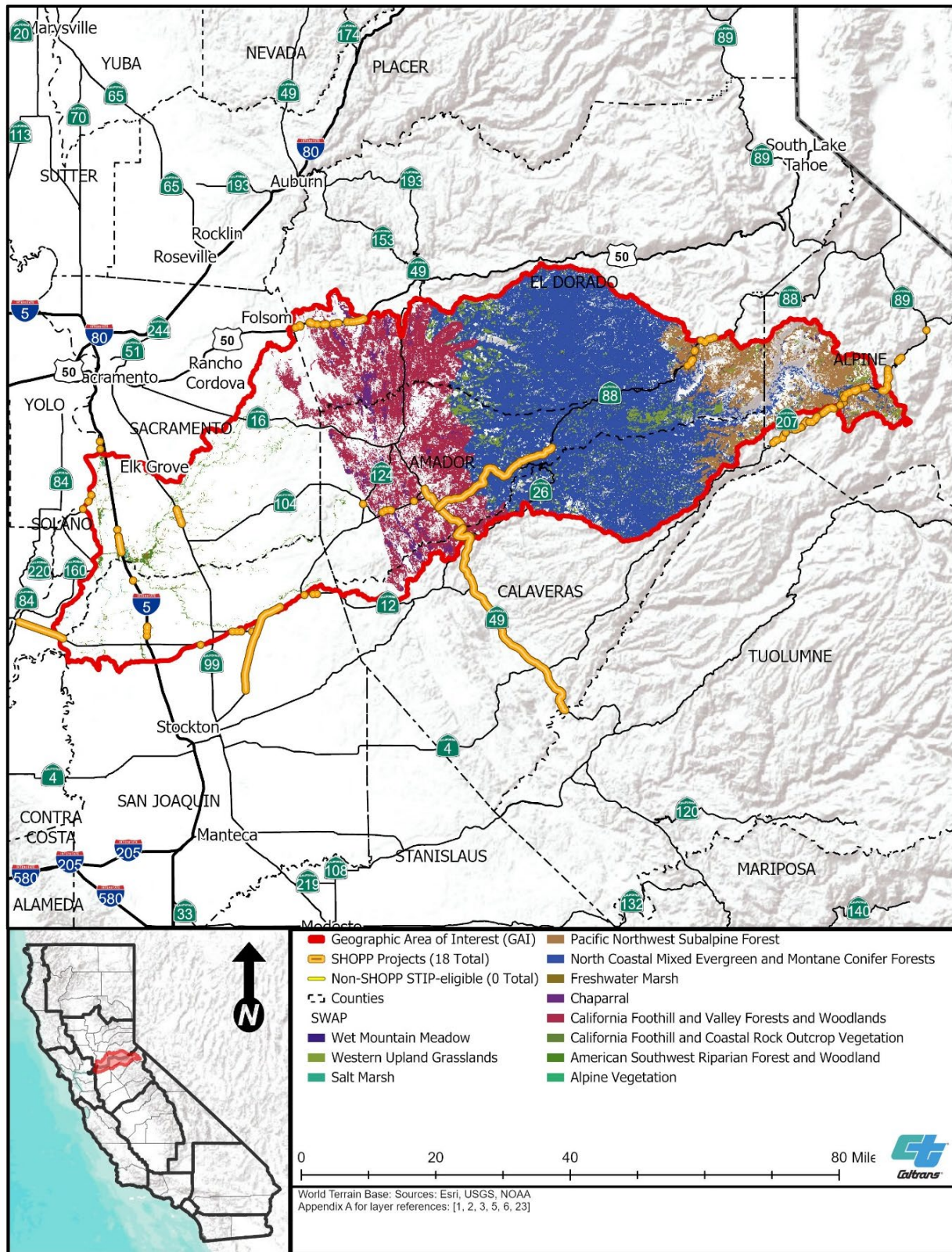
Objective	Sub-Objective	Affected Species ^a	Alignment with Conservation and Management Plans ^b
Goal WILD-2: Preserve, enhance, and increase connectivity between blocks of habitat supporting species of mitigation need to allow for dispersal that will maintain resilience and variability of populations.	See below	See below	See below
Objective WILD- 2.1: Acquire, protect, restore, and/or enhance movement corridors in the GAI in advance of transportation project impacts.	Sub-Objective WILD-2.1.1: Identify movement corridors for the species of mitigation need in the GAI and acquire, protect, restore, and/or enhance corridors such that the greatest functional lift for the species of mitigation need is provided. Sub-Objective WILD-2.1.2: Prioritize habitat in key linkage areas, between habitat areas, and/or areas that provide a buffer to key or existing corridors.^c Sub-Objective WILD-2.1.3: Identify areas that will enhance connectivity between existing protected breeding locations and create new breeding habitat for the species of mitigation need.^c	- California red-legged frog - foothill yellow-legged frog - giant garter snake	- SWAP (CDFW 2015) and companion plans (CDFW 2016a, 2016b) - CEHC (Spencer et al. 2010) - Recovery Plan for the California Red-legged Frog (<i>Rana aurora draytonii</i>) (FWS 2002) - A Status Review of the Foothill Yellow-legged Frog (<i>Rana boylei</i>) in California (CDFW 2019d) - Recovery Plan for the Giant Garter Snake (<i>Thamnophis gigas</i>) (FWS 2017b) - Giant Garter Snake 5-Year Review (FWS 2020) - Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan (FWS 2007) - City of Lone General Plan (City of Lone 2009) - City of Isleton General Plan (City of Isleton 2024) - Rancho Cordova General Plan (City of Rancho Cordova 2006) - Amador County General Plan (Amador County 2016) - Calaveras County General Plan (Calaveras County 2019) - El Dorado County General Plan (El Dorado County 2017) - Sacramento County General Plan (Sacramento County 2010) - Yolo RCIS/LCP (Yolo Habitat Conservancy 2020)
Goal WILD-3: Support resiliency of the landscape to climate change and sea level rise.	See below	See below	See below
Objective WILD-3.1: Acquire, protect, restore, and/or enhance habitat that supports resilience to climate change and sea level rise 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 the species of mitigation need in the GAI (Figure 2-5). Sub-Objective WILD-3.1.2: Prioritize management of invasive species in key areas, such as movement corridors, that may be exacerbated by climate change and sea level rise and that would provide functional lift for the species of mitigation need.	- California red-legged frog - foothill yellow-legged frog - giant garter snake - Swainson's hawk - valley elderberry longhorn beetle	- SWAP (CDFW 2015) and companion plans (CDFW 2016a, 2016b) - CEHC (Spencer et al. 2010) - Delta Adapts: Creating a Climate Resilient Future (Delta Stewardship Council 2024a) - The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value (Delta Stewardship Council 2024b) - Recovery Plan for the California Red-legged Frog (<i>Rana aurora draytonii</i>) (FWS 2002) - A Status Review of the Foothill Yellow-legged Frog (<i>Rana boylei</i>) in California (CDFW 2019d) - Recovery Plan for the Giant Garter Snake (<i>Thamnophis gigas</i>) (FWS 2017b) - Giant Garter Snake 5-Year Review (FWS 2020) - Five Year Status Review for Swainson's Hawk (<i>Buteo swainsoni</i>) (CDFW 2016c) - Revised Recovery Plan for Valley Elderberry Longhorn Beetle (FWS 2019) - Valley Elderberry Longhorn Beetle 5-Year Review (FWS 2006) - Cosumnes, American, Bear, and Yuba River Integrated Regional Water Management Plan (Cosumnes, American, Bear, and Yuba River Regional Water Management Group 2021) - El Dorado County General Plan (El Dorado County 2017) - Calaveras County General Plan (Calaveras County 2019) - Sacramento County General Plan (Sacramento County 2010) - Yolo RCIS/LCP (Yolo Habitat Conservancy 2020)

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 the species of mitigation need. Prioritize areas where invasive species reduction would provide the greatest functional lift to species of mitigation need and their habitat. Sub-Objective WILD-4.1.2: Prioritize restoration of native plant species in key areas, such as critical habitat, movement corridors, and buffer zones.	- California red-legged frog - foothill yellow-legged frog - giant garter snake - valley elderberry longhorn beetle	- SWAP (CDFW 2015) and companion plans (CDFW 2016a, 2016b) - CEHC (Spencer et al. 2010) <i>Recovery Plan for the California Red-legged Frog</i> (Rana aurora draytonii) (FWS 2002) <i>Considerations for Conserving the Foothill Yellow-Legged Frog</i> (CDFW 2018c) <i>A Status Review of the Foothill Yellow-legged Frog</i> (Rana boylei) in California (CDFW 2019d) <i>Recovery Plan for the Giant Garter Snake</i> (Thamnophis gigas) (FWS 2017b) <i>Giant garter snake 5-Year Review</i> (FWS 2020) <i>Revised Recovery Plan for Valley Elderberry Longhorn Beetle</i> (FWS 2019) <i>Valley Elderberry Longhorn Beetle 5-Year Review</i> (FWS 2006) <i>Cosumnes, American, Bear, and Yuba River Integrated Regional Water Management Plan</i> (Cosumnes, American, Bear, and Yuba River Regional Water Management Group 2021) <i>Forest Plan Direction</i> (USDA 2017) <i>Mokelumne Watershed Plan</i> (East Bay Municipal Utility District 2008) <i>Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update</i> (Upper Mokelumne River Watershed Authority 2024) <i>Sacramento River National Wildlife Refuge Final Comprehensive Conservation Plan</i> (FWS 2005b) <i>Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan</i> (FWS 2007) <i>Prairie City State Vehicular Recreation Area General Plan</i> (California State Parks 2022) <i>El Dorado County General Plan</i> (El Dorado County 2017) <i>Lodi General Plan</i> (City of Lodi 2010) <i>Sacramento County General Plan</i> (Sacramento County 2010) <i>Yolo RCIS/LCP</i> (Yolo Habitat Conservancy 2020)
Objective WILD-4.2: Reduce impacts from nonnative 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 with a hydrologic regime that would discourage bullfrogs from establishing.	- California red-legged frog - foothill yellow-legged frog - giant garter snake	- SWAP (CDFW 2015) and companion plans (CDFW 2016a, 2016b) - CEHC (Spencer et al. 2010) <i>Recovery Plan for the California Red-legged Frog</i> (Rana aurora draytonii) (FWS 2002) <i>Considerations for Conserving the Foothill Yellow-Legged Frog</i> (CDFW 2018c) <i>A Status Review of the Foothill Yellow-legged Frog</i> (Rana boylei) in California (CDFW 2019d) <i>Recovery Plan for the Giant Garter Snake</i> (Thamnophis gigas) (FWS 2017b) <i>Giant Garter Snake 5-Year Review</i> (FWS 2020) <i>Five Year Status Review for Swainson's Hawk</i> (Buteo swainsoni) (CDFW 2016c) <i>Revised Recovery Plan for Valley Elderberry Longhorn Beetle</i> (FWS 2019) <i>Valley Elderberry Longhorn Beetle 5-Year Review</i> (FWS 2006) <i>Cosumnes, American, Bear, and Yuba River Integrated Regional Water Management Plan</i> (Cosumnes, American, Bear, and Yuba River Regional Water Management Group 2021) <i>Sacramento River National Wildlife Refuge Final Comprehensive Conservation Plan</i> (FWS 2005b) <i>Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan</i> (FWS 2007) <i>Sacramento County General Plan</i> (Sacramento County 2010) <i>Yolo RCIS/LCP</i> (Yolo Habitat Conservancy 2020)
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 the species of mitigation need to them.	- California red-legged frog - foothill yellow-legged frog - giant garter snake	- SWAP (CDFW 2015) and companion plans (CDFW 2016a, 2016b) <i>Recovery Plan for the California Red-legged Frog</i> (Rana aurora draytonii) (FWS 2002) <i>A Status Review of the Foothill Yellow-legged Frog</i> (Rana boylei) in California (CDFW 2019d) <i>Recovery Plan for the Giant Garter Snake</i> (Thamnophis gigas) (FWS 2017b) <i>Giant Garter Snake 5-Year Review</i> (FWS 2020) <i>Calaveras County General Plan</i> (Calaveras County 2019) <i>Yolo RCIS/LCP</i> (Yolo Habitat Conservancy 2020)

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 for special-status species that may co-occur with the species of mitigation need and that will provide functional lift to other special-status species in the GAI. Sub-Objective WILD-5.1.2: Identify SHS right-of-way areas where enhancement efforts may benefit pollinators, as well as the species of mitigation need, such as low traffic areas and other areas that would support pollinators and species of mitigation need, while reducing road-associated mortality. Sub-Objective WILD-5.1.3: 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.	▪ California red-legged frog ▪ foothill yellow-legged frog ▪ giant garter snake ▪ Swainson's hawk ▪ valley elderberry longhorn beetle	▪ SWAP (CDFW 2015) and companion plans (CDFW 2016a, 2016b) ▪ CEHC (Spencer et al. 2010) ▪ <i>Delta Adapts: Creating a Climate Resilient Future</i> (Delta Stewardship Council 2024a) ▪ <i>The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value</i> (Delta Stewardship Council 2024b) ▪ <i>Recovery Plan for the California Red-legged Frog</i> (Rana aurora draytonii) (FWS 2002) ▪ <i>A Status Review of the Foothill Yellow-legged Frog</i> (Rana boylei) in California (CDFW 2019d) ▪ <i>Recovery Plan for the Giant Garter Snake</i> (Thamnophis gigas) (FWS 2017b) ▪ <i>Giant Garter Snake 5-Year Review</i> (FWS 2020) ▪ <i>Five Year Status Review for Swainson's Hawk</i> (Buteo swainsoni) (CDFW 2016c) ▪ <i>Staff Report Regarding Mitigation for Impacts to Swainson's Hawks</i> (Buteo swainsoni) in the Central Valley of California (California Department of Fish and Game 1994) ▪ <i>Revised Recovery Plan for Valley Elderberry Longhorn Beetle</i> (FWS 2019) ▪ <i>Valley Elderberry Longhorn Beetle 5-Year Review</i> (FWS 2006) ▪ <i>Forest Plan Direction</i> (USDA 2017) ▪ <i>Prairie City State Vehicular Recreation Area General Plan</i> (California State Parks 2022) ▪ <i>Sacramento River National Wildlife Refuge Final Comprehensive Conservation Plan</i> (FWS 2005b) ▪ <i>City of Lone General Plan</i> (City of Lone 2009) ▪ <i>City of Isleton General Plan</i> (City of Isleton 2024) ▪ <i>City of Galt General Plan</i> (City of Galt 2009) ▪ <i>El Dorado County General Plan</i> (El Dorado County 2017) ▪ <i>Lodi General Plan</i> (City of Lodi 2010) ▪ <i>Rancho Cordova General Plan</i> (City of Rancho Cordova 2006) ▪ <i>Sacramento County General Plan</i> (Sacramento County 2010) ▪ <i>Yolo RCIS/LCP</i> (Yolo Habitat Conservancy 2020)

^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*, and Chapter 4, *Existing Mitigation Opportunities*.
^c As identified in recovery plans and other pertinent documents (see Table 7-2).

Figure 7-2. State Wildlife Action Plan Conservation Target Habitats



7.8 Summary

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

- habitat loss, fragmentation, and degradation;
- invasive species;
- disease and predation;
- climate change, drought, wildfire, and sea level rise; and
- contaminants.

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 function lift or conservation benefit and by mitigating the pressures and stressors on wildlife resources in the GAI. To summarize Table 7-3:

- **Goals WILD-1 and WILD-2** seek to conserve and expand 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 the species of mitigation need, and that provide a conservation benefit in terms of size, connectivity, quality, and contribution to the climate resilience of habitat in the GAI. By increasing connectivity for species of mitigation need, Caltrans anticipates that co-occurring species will realize these same benefits. These goals and objectives were selected to address habitat loss, fragmentation, and degradation and to address impacts from climate change, drought, and wildfires. Further, Caltrans anticipates that actions completed through restoration, enhancement, and/or preservation may also provide opportunities to address invasive species, predation, and road-associated mortality.
- **Goal WILD-3** seeks to support landscape resiliency for species of mitigation need habitat in the GAI. The primary objectives are to reduce the effects of climate change and sea level rise on these species by increasing the protection and functionality of land that is identified as crucial for climate resiliency, including corridors that allow the wildlife species to migrate from areas of low climate resilience into areas with higher resilience and addressing the climate change-related threat from invasive species. In addition to addressing climate change in general, these goals and objectives address habitat loss, fragmentation, and degradation, and invasive species.
- **Goal WILD-4** seeks to decrease mortality of species of mitigation need from known immediate and ongoing threats to individuals or populations by protecting native

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

- **Goal WILD-5** seeks to guide advance mitigation scoping to prioritize multi-species and multi-resource benefits to maximize ecological benefits in the GAI. Advance mitigation provides the opportunity to maximize Caltrans' benefit to conservation in the GAI, including to species other than the species of mitigation need and other land management objectives. Goal WILD-5 was developed to include conservation for multiple species.

Each of the goals and objectives have sub-objectives intended to guide advance mitigation scoping toward natural resource regulatory agencies' regional conservation goals. These sub-objectives will prompt Caltrans to incorporate priority habitat or corridors into advance mitigation scopes and address important threats in the area through an advance mitigation project. This concept is an important way Caltrans seeks to use advance mitigation scoping to set the stage, once funding approval is received, for specific advance mitigation projects that will provide a functional lift for the species of mitigation need and maximize conservation benefits from mitigation 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, 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 restoration, enhancement, and preservation, and to provide 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 to 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 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 riparian habitat restoration and enhancement, and should yield compensatory mitigation usable by future transportation projects, as specified in SHC § 800. 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.¹ Transportation projects must still go through environmental and permitting processes, and must demonstrate avoidance and minimization efforts prior to compensation.

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).

8.1 Approach

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

To determine the aquatic resource conservation goals and objectives applicable to the GAI:

- First, in Section 8.2, Caltrans 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, Caltrans summarizes information for 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, Caltrans 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 analyzes 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 the habitats necessary for biologically sustainable populations of those species in California. California law (FGC § 1602) also requires an entity to notify CDFW prior to commencing any activity that may substantially divert or obstruct the natural flow of any river, stream, or lake; substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or deposit or dispose of debris, waste, or other materials containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. CDFW issues agreements to project proponents under its authorities, including Lake and Streambed Alteration Agreements, conservation and mitigation bank approvals, MCA and RCIS approvals, and NCCP permits. Under the 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. According to the 2008 mitigation rule, in general it is the preference of the Corps to use the following order of priority for mitigation: mitigation bank, in-lieu fee program, permittee-responsible mitigation under the watershed approach, on-site permittee responsible mitigation, and off-site permittee responsible mitigation, but the preference may change based on what is environmentally preferable.
EPA	EPA has authority under the CWA (33 USC § 11251–1357) to restore and maintain the chemical, physical, and biological integrity of the nation's waters. EPA and the Corps jointly implement the CWA Section 404 program, which regulates discharge of dredge or fill material into WOTUS. Federal authorizations also need to be reviewed for compliance with CWA Section 401. EPA has been delegated the responsibility of implementing CWA Section 401 for projects on tribal land, unless EPA has delegated 401 authority to a recognized tribe.

Agency	Summary
FWS	FWS has jurisdiction over a broad range of fish and wildlife resources. FWS does not, however, have jurisdiction over anadromous fish. FWS authorities related to these resources are codified under multiple statutes, including, but not limited to, the 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. In May 2023, FWS issued a Mitigation Policy that builds upon the guidance in the 1981 Mitigation Policy for recommendations and requirements on mitigating adverse impacts of land and water developments on fish and wildlife, and an FESA Compensatory Mitigation Policy that adopts mitigation principles established in the FWS Mitigation Policy, establishes compensatory mitigation standards, and provides guidance for the application of compensatory mitigation through implementation of the FESA. Conservation banking can assist federal and non-federal participants in the Sections 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.

Agency	Summary
Water Boards	The Porter-Cologne Act governs water quality regulation in California and gives the Water Boards the authority to condition projects, through waste discharge requirements, to protect water quality and the beneficial uses of waters of the state, as identified in Basin Plans. Basin Plans, adopted by the RWQCBs, incorporate the beneficial use designation of waters of the state and must take into consideration the use and value of water for protection and propagation of fish, shellfish, and wildlife. The Water Boards have been delegated the responsibility of implementing CWA Section 401, which regulates the discharge of pollutants into WOTUS. The Water Boards may determine that compensatory mitigation is necessary to offset unavoidable impacts on aquatic resources. Compensatory mitigation can be achieved through the purchase of credits, as outlined in the <i>State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State</i> (SWRCB 2019). Projects that occur in one region are regulated by that regional board, whereas projects that cross regions (or have statewide significance) are regulated by SWRCB.

8.3 Aquatic Resources

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

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

Upper Mokelumne HUC-8 18040012	Upper Cosumnes HUC-8 18040013
▪ Antelope Creek ▪ Bear River ▪ Cache Creek ▪ Camanche Reservoir ▪ Coyote Creek ▪ Dry Creek ▪ Mill Creek ▪ Mokelumne River ▪ Pardee Reservoir ▪ Sacramento River Drainage Canal ▪ Stony Creek	▪ Badger Creek ▪ Ban Ponds ▪ Butte Creek ▪ Clear Creek ▪ Cosumnes River ▪ Cougar Wetlands ▪ Deer Creek ▪ Folsom South Canal ▪ Horseshoe Marsh ▪ Lost Slough ▪ Lost Slough East ▪ Snake Marsh ▪ Valensin Badger Creek Ponds ▪ West Bottoms ▪ Willow Creek ▪ Willow Slough

8.3.1. Wetlands and Non-wetland Waters

In the GAI, the major stream systems include the Mokelumne, Cosumnes, and Bear Rivers as well as Cache, Clear, Deer, and Stony Creeks (Central Valley RWQCB 2018). Additionally, there are hundreds of named and unnamed tributaries, the majority of which flow into these rivers. Flow into these systems originates from rainfall and snowfall in the Sierra Nevada (Figure 2-4).

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 106,085 acres of aquatic habitat, consisting of 35 wetland habitats listed in Table 2-6 (Caltrans 2024f). Five 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 2-5).

Vernal Pool Habitat

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

8.3.2. Riparian Habitat

Riparian habitat information was excerpted from the SAMNA's vegetation layer. The riparian habitats identified in the GAI are blue oak woodland, valley foothill riparian, riverine, lacustrine, montane riparian, fresh emergent wetland, saline emergent wetland, and wet meadow (Table 2-3). 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. Fish Species of Mitigation Need

Threatened and endangered fish species were identified in Section 2.15.2 and are described below.

Chinook Salmon

Two ESUs of Chinook salmon overlap the GAI: Central Valley spring-run ESU and Sacramento River winter-run ESU (Section 2.15.2). The Central Valley spring-run ESU is federally listed as threatened and state listed as endangered. The Sacramento River winter-run ESU is federally listed as endangered and state listed as threatened. Designated critical habitat for the Central Valley spring-run ESU of this species does occur in the GAI; however, designated critical habitat for the Sacramento River winter-run ESU of this species does not occur in the GAI (Section 2.8). The Sacramento River winter-run ESU includes all spawned winter-run Chinook salmon originating from the Sacramento River and its tributaries. It also includes winter-run Chinook salmon from the Livingston Stone National Fish Hatchery [81 *Federal Register* 72761]. The Central Valley spring-run ESU includes all naturally spawned spring-run Chinook salmon originating from the Sacramento River and its tributaries, and also spring-run Chinook salmon from the Feather River Hatchery Spring-run Chinook Program [70 *Federal Register* 37159].

Adult spring-run Chinook salmon migrate through the bay delta and into the lower Sacramento River between March and September, primarily between May and June. They remain in the lower Sacramento River for several months as they mature and move into the mainstem of the Sacramento River to spawn between mid-August and early October, primarily in September. Embryos generally require 40 to 60 days to hatch,

remaining as alevins for another 4 to 6 weeks, and then emerge as fry between November and March. They generally remain in the river for 12 to 16 months before migrating down through the bay delta and out to the ocean (NMFS 2014).

Adult winter-run Chinook salmon migrate through the bay delta and into the lower Sacramento River between December and July. They remain in the lower Sacramento River as they mature. Winter-run Chinook salmon spawn between late-April and mid-August, but mostly between June and July (NMFS 2014).

Habitat requirements for both runs of Chinook salmon generally consist of deep, cool, well-oxygenated water for immature adults migrating to spawn, clean loose gravel in swift shallow waters for spawning, and cold water during and after spawning to protect eggs and embryos from ambient heat. Juvenile Chinook salmon require riparian vegetation and substrates that allow for sources of invertebrates for food and strongly prefer shallow water habitats as they migrate outward from the Sacramento River (NMFS 2014).

Delta Smelt

Delta smelt is federally listed as threatened and state listed as endangered. Critical habitat has been designated for this species (Sections 2.8 and 2.15.2). Delta smelt are endemic to the upper Sacramento-San Joaquin estuary and occur in the Sacramento-San Joaquin River Delta primarily below Isleton on the Sacramento River, below Mossdale on the San Joaquin River, and in Suisun Bay. They move into freshwater between January to July for spawning. Spawning generally takes place in areas of relatively cool water and high oxygen concentrations in the Sacramento River as high as Sacramento, the Mokelumne River system, the Cache Slough region, the Sacramento-San Joaquin River Delta, and the Montezuma Slough area of the estuary. During high outflow periods, they may be washed into San Pablo Bay, but they do not establish permanent populations there. Delta smelt tolerates a wide range of salinities but generally occurs in areas of no more than one-third that of sea water (FWS 1996).

Green Sturgeon

The Southern ESU of green sturgeon is a federally threatened species and a state species of special concern, and designated critical habitat for this species occurs in the GAI (Sections 2.8 and 2.15.2). This ESU includes naturally spawned green sturgeon originating in the Sacramento, Feather, and Yuba Rivers [71 *Federal Register* 17757]. Green sturgeon use riverine, estuary, and marine habitats along the western coast of California, spending most of their life cycle in marine waters. Adults enter San Francisco Bay in late winter through early spring and spawn in the upper portions of the Sacramento River from April through early July. Post spawn fish typically hold for several months in the Sacramento River prior to out-migrating to the San Francisco Bay Delta Estuary or the Pacific Ocean during fall or winter. Juveniles leave from the Sacramento River after 6 months to 2 years to the San Francisco Bay area and into the Pacific Ocean (NMFS 2021a).

Longfin Smelt

Longfin smelt is a federally endangered and state-threatened species. Designated critical habitat has been proposed for this species (Sections 2.8 and 2.15.2). In California, longfin smelt occur from the Klamath River to San Francisco Bay and rivers that exit into the bay, such as the Sacramento and San Joaquin Rivers. Longfin smelt larvae flow outward to the ocean during winter to spring, with short to long retention in coastal bays and estuaries. Mature longfin smelt return to river waters for spawning, which typically occurs during late fall through spring. Longfin smelt require cool water, no warmer than 72 degrees Fahrenheit, and spawn in sandy substrates in low-velocity streams (California Department of Fish and Game 2009).

Steelhead

The Central Valley DPS of steelhead is a federal 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 Rivers 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 and the Mokelumne River Hatchery Program [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, which is 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).

8.4 Regional Conservation Efforts

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

Table 8-3. 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>	<i>73 Federal Register</i> 19593	Corps' ruling to establish standards and criteria for the use of all types of compensatory mitigation, including on- and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts on WOTUS. Recognizes that consolidating mitigation may be environmentally preferable for linear projects (because advance or at least concurrent compensatory mitigation is environmentally preferable, but not always possible to achieve) (Preamble and 33 Section 332.3).
<i>2020 Fish Passage Annual Legislative Report</i>	Caltrans 2021	In compliance with SHC § 156, this report identifies priority fish passage barriers on the SHS. Priorities are determined through FishPAC collaboration and are based on: ▪ Species diversity – listed threatened and endangered salmon and steelhead species currently or historically present in the watershed; ▪ Habitat – suitable habitat quality and quantity above each crossing, relative to recovery of threatened and endangered species; and ▪ Best professional knowledge – professional, discretionary value for science-based information known to fisheries and engineering subject matter experts. Subject matter experts include CDFW, NMFS, FWS, CCC, CalTrout, Pacific States Marine Fisheries Commission, and other local fish passage advocates.
<i>303(d) List of Impaired Water Bodies</i>	SWRCB 2021	Section 303(d) of the CWA requires that every 2 years, each state submits to EPA a list of rivers, lakes, and reservoirs in the state for which pollution control or requirements have failed to provide for water quality. Based on a review of this list and its associated Total Maximum Daily Load Priority Schedule (Appendix F in this document), 15 waterbodies are listed as impaired in the GAI. Of the 15, none have an established TMDL.
<i>California Wetlands Conservation Policy</i>	Executive Order W-59-93	The “No Net Loss Policy” for wetlands aims to “[e]nsure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship and respect for private property.”

Document	Reference	Information Identified
<i>National Wetlands Mitigation Action Plan</i>	EPA and Corps 2002	An EPA and Corps comprehensive, interagency document to further achievement of the goal of no net loss of wetlands. The goals and objectives of the <i>National Wetlands Mitigation Action Plan</i> were incorporated into the 2008 Final Compensatory Mitigation Rule, which was updated in 2015 and includes the no net loss policy.
<i>Final 2015 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.
<i>Water Quality Control Plan for the Central Valley Basin</i>	Central Valley RWQCB 2018	Identifies water quality objectives and beneficial uses for the Sacramento River Basin.
Special-Status Species and Sensitive Habitat Documents	See below	See below
<i>Delta Smelt Resiliency Strategy</i>	CDFW 2016d	Includes a number of goals for improving the delta smelt population condition, including: ▪ removal of aquatic invasive species ▪ addition of supplemental sediment into the low-salinity zone of the Sacramento River Delta ▪ implementation of habitat restoration projects in seven locations in the Sacramento River Delta

Document	Reference	Information Identified
<i>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</i>	NMFS 2014	Includes the following goal for improving the Chinook salmon and steelhead population condition in the Sacramento River Delta: - Conduct aquatic habitat restoration such that it contributes to an overall goal of 17,000 to 20,000 acres of restored habitat in the Sacramento and San Joaquin River Delta. Includes goals to generally restore habitat for salmonids in the GAI at the following locations with specific measures: - Antelope Creek – specifically improve water quality, restore connectivity of the migration corridor, restore side channel habitats, create and restore riparian and floodplain habitat, develop and implement TMDLs, and utilize bio-technical techniques for riparian restoration for river bank stabilization - Mill Creek – specifically improve water quality and enhance riparian habitat - Deer Creek – specifically implement vegetation and fuel treatments to reduce severity of wildfires, conduct meadow restoration, enhance streamside vegetation and reduce bank disturbance, and improve water quality - Dry Creek – specifically control nonnative predators such as striped bass, largemouth bass, and smallmouth bass; remove fish barriers; and utilize bio-technical techniques for riparian restoration for river bank stabilization - Stony Creek – specifically restore meadows to increase summer flows and reduce local water temperatures, increase riparian shade, increase floodplain habitat, and improve water quality - Clear Creek – specifically restore meadows and forested areas, restore floodplain habitat, reduce sediment, and utilize bio-technical techniques for riparian restoration for river bank stabilization - Mokelumne River – specifically manage water temperature in cold water pools in Camanche and Pardee reservoirs, develop fish passage programs, improve water quality, and implement projects to minimize predation - Cosumnes River – specifically implement projects to minimize predation and entrainment
<i>Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes</i>	FWS 1996	Includes general goals to restore the population of delta smelt and longfin smelt sufficient to delist delta smelt and prevent longfin smelt from becoming listed.

Document	Reference	Information Identified
<i>Recovery Plan for the Southern Distinct Population Segment of North American Green Sturgeon</i> (<i>Acipenser medirostris</i>)	NMFS 2018	Includes goals to reduce contaminants, enhance and/or restore habitat, and reduce the presence of nonnative species that likely consume green sturgeon as well as to preferentially perform these actions in the San Joaquin watershed, which includes a portion of the Upper Cosumnes and Upper Mokelumne HUC-8s.
<i>Department of Fish and Game Report to the Fish and Game Commission: A Status Review of the Longfin Smelt</i> (<i>Spirinchus thaleichthys</i>) in California	California Department of Fish and Game 2009	Includes recovery measures to attempt and determine the extent of their benefit to longfin smelt. These measures include: ▪ reducing water pollution ▪ managing nonnative fish that consume longfin smelt ▪ enhancing and/or creating habitat for longfin smelt
<i>Endangered and Threatened Wildlife and Plants; Endangered Species Status for the San Francisco Bay-Delta Distinct Population Segment of the Longfin Smelt</i>	FWS 2024	Enumerates the FWS' determination that longfin smelt (<i>Spirinchus thaleichthys</i>) have been granted endangered species status under the FESA. This rule extends the protections of the FESA to this DPS and adds it to the list of endangered and threatened wildlife.
<i>Endangered and Threatened Wildlife and Plants; Designation of Critical Habitat for the San Francisco Bay- Delta Distinct Population Segment of the Longfin Smelt</i>	FWS 2025	Proposes to designate critical habitat for the San Francisco Bay-Delta DPS of longfin smelt (<i>Spirinchus thaleichthys</i>) under the FESA. In total, approximately 91,630 acres in California fall within the boundaries of the proposed critical habitat designation.
<i>Steelhead Restoration and Management Plan for California</i>	California Department of Fish and Game 1996	Identified restoration recommendations in the Mokelumne River and in Antelope, Butte, Deer, and Mill Creeks. Recommendations consist generally of habitat restoration and improving stream flow.

Document	Reference	Information Identified
<i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i>	FWS 2005a	The following vernal pool regions and core areas occur in the GAI: ▪ Southeastern Sacramento Valley region – Mather, Cosumnes/Rancho Seco, and Southeast Sacramento Valley core areas Listed species for recovery that use aquatic habitat in the core areas include False venus' looking glass (<i>Legenere limosa</i>), Boggs Lake hedgehyssop (<i>Gratiola heterosepala</i>), slender Orcutt grass (<i>Orcuttia tenuis</i>), Sacramento Orcutt grass (<i>Orcuttia viscida</i>), vernal pool fairy shrimp (<i>Branchinecta lynchi</i>), conservancy fairy shrimp (<i>Branchinecta conservatio</i>), and vernal pool tadpole shrimp (<i>Lepidurus packardi</i>). Additional species expected to benefit from recovery actions in these areas include Ahart's dwarf rush (<i>Juncus leiospermus</i> var. <i>ahartii</i>), mid-valley fairy shrimp (<i>Branchinecta mesovallensis</i>), California fairy shrimp (<i>Linderiella occidentalis</i>), and western spadefoot toad (<i>Spea hammondi</i>).
Conservation and Land Management Documents	See below	See below
<i>2014 Eastern San Joaquin Integrated Regional Water Management Plan Update</i>	Eastern San Joaquin County Groundwater Basin Authority 2014	Includes a goal to improve water quality in the plan area, which is in portions of the Upper Mokelumne HUC-8.
<i>American River Basin Integrated Regional Water Management Plan</i>	Regional Water Authority 2018	Includes general goals to improve riparian habitat and reduce invasive species in the plan area, which includes portions of the Upper Cosumnes HUC-8. Restoration goals cumulatively include: ▪ 182 acres of riparian habitat ▪ 33 acres of elderberry habitat ▪ 124 acres of woodland habitat ▪ salmonid habitat enhancement

Document	Reference	Information Identified
<i>Cosumnes River Preserve Management Plan</i>	CDFW 2008	Includes goals to: ▪ Restore the quality and diversity of the valley oak riparian forest and the freshwater seasonal wetlands ▪ Control nonnative invasive species (such as perennial pepperweed, water primrose [<i>Ludwigia peploides</i>], and water hyacinth) in riparian and floodplain habitats ▪ Restore approximately 500 acres of seasonally flooded riparian habitat on the Preserve's Denier II property ▪ Implement restoration plans for 500 acres of riparian-floodplain habitat ▪ Create at least 2,750 acres of flooded agriculture as seasonal wetland habitat ▪ Restore tidal freshwater wetlands ▪ Restore and/or create approximately 140 acres of managed freshwater wetlands (including Valensin Badger Creek Ponds, Horseshow Marsh, Snake Marsh, Lost Slough East, Ban Ponds, Lost Slough, Willow Slough, West Bottoms, and Cougar Wetlands) ▪ Restore perennial wetland habitat in the Badger Creek watershed for the giant garter snake ▪ Restore existing 135 acres of perennial habitat at Snake Marsh ▪ Implement weed control measures to minimize impact of invasive water primrose in Snake Marsh and upstream sources in Badger and Willow Creeks ▪ Enhance river flows to reconnect the Cosumnes River during the October to December flow period ▪ Enhance spawning habitat in the Cosumnes River between Highway 16 and Meiss Road within 10 years
<i>Delta Adapts: Creating a Climate Resilient Future</i>	Delta Stewardship Council 2024a	Identifies four ecosystem strategies to strengthen the climate adaptation potential of Delta ecosystems: ▪ Improve the capacity of ecosystems and native species to adapt to and thrive under future conditions ▪ Protect at-risk ecosystems by halting and reversing subsidence and reducing the risk of levee failures ▪ Build capacity and coordination to improve ecosystem function and resilience ▪ Protect and enhance urban ecosystems and use nature-based solutions to increase climate resilience of urban areas in and near the Delta and Suisun Marsh

Document	Reference	Information Identified
<i>The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value</i>	Delta Stewardship Council 2024b	Makes policies and recommendations for restoring the Delta ecosystem, including the following core strategies: ▪ Create more natural functional Delta flows ▪ Restore habitat ▪ Improve water quality to protect the ecosystem ▪ Prevent introduction of and manage nonnative species impacts ▪ Improve hatcheries and harvest management More details are provided in Chapter 4 of the plan.
<i>Eagle Lake Field Office Proposed Resource Management Plan and Final Environmental Impact Statement</i>	BLM 2007	Includes a goal to improve 35 miles of perennial or intermittent streams and 33 acres of riparian/wetland areas in the management area.
<i>Final 2022 Prairie City State Vehicular Recreation Area Wildlife Habitat Protection Plan</i>	California State Parks 2022	Includes a goal to restore 20 acres of eroded area along Coyote Creek as part of the Coyote Gulch project. Medusahead and barbed goatgrass have a high priority of removal within the vernal pool management areas.
<i>Groundwater Sustainability Plan Cosumnes Subbasin</i>	EKI Environment and Water, Inc. 2021	Includes goals to improve flows for fish migration from Folsom South Canal into the Cosumnes River within the Upper Cosumnes HUC-8.
<i>Cosumnes, American Bear, and Yuba Watersheds Integrated Regional Watershed Management Plan</i>	Cosumnes, American, Bear, and Yuba River Regional Water Management Group 2021	Includes the following goals in the plan area, which includes portions of the Cosumnes River HUC-8: ▪ Restore the natural sediment regime in at least three river reaches ▪ Enhance and/or restore at least 4 miles of streams ▪ Treat at least 50 acres of riparian habitat for nonnative plant species
<i>Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update</i>	Upper Mokelumne River Watershed Authority 2024	Includes goals to improve fish passage for Chinook salmon and steelhead populations in the Mokelumne River.

Document	Reference	Information Identified
<i>San Joaquin County Multi-Species Habitat Conservation and Open Space Plan (SJMSCP)</i>	San Joaquin Council of Governments 2000	Includes general goals to minimize the effect of land conversion on aquatic habitats. Specific goals include: ▪ creating new submerged aquatic habitats at a ratio of 3:1 following conversion ▪ providing construction buffers of at least 100 feet throughout the construction process from riparian habitats
<i>Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement</i>	USFS 2004	Includes a goal to restore aquatic habitats in the national forests of the GAI.
<i>Stanislaus National Forest – Forest Plan Direction</i>	USFS 2017	Includes objectives to: ▪ Restore water quality ▪ Restore habitat to support viable populations of riparian-dependent species ▪ Restore the distribution and health of biotic communities in special aquatic habitats ▪ Restore spatial and temporal connectivity for aquatic and riparian species as well as floodplains and channels ▪ Restore the physical structure and condition of stream banks and shorelines ▪ Improve quality of spawning gravels for fish
<i>Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan</i>	FWS 2007	Only the northernmost approximately 12 acres of the Stone Lakes National Wildlife Refuge is inside of the GAI; however, the following goals of the refuge are pertinent to the GAI: ▪ Expand the riparian zone to a range of 150 to 400 feet wide along the Sacramento Drainage Canal ▪ Remove perennial pepperweed in riparian areas
SWAP	CDFW 2015	Identified American Southwest riparian forest, and woodland and freshwater marsh as conservation targets. Includes goals to increase freshwater emergent wetland habitat by 5% and increase functional riparian habitat by 5% by 2025 from 2,015 acres. Identifies Brazilian waterweed (<i>Egeria densa</i>), Eurasian watermilfoil (<i>Myriophyllum spicatum</i>), hydrilla, water hyacinth, and parrot feather (<i>Myriophyllum aquaticum</i>) as invasive species that invades aquatic habitats in the GAI.

8.5 Pressures and Stressors

Pressures and stressors refer to environmental trends or physical, chemical, or biological factors or conditions that affect aquatic resources. According to the SWAP (CDFW 2015), a pressure is defined as “an anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of the target. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target is likely to be significant.” Additionally, stress is defined in the SWAP as “[a] degraded ecological condition of a target that resulted directly² or indirectly from negative impacts of pressures (e.g., habitat fragmentation)” (CDFW 2015). 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 the SHOPP and could benefit from in-kind mitigation purchased or established through an advance mitigation project.

8.5.1. Habitat Loss, Fragmentation, and Degradation

Urbanization and other anthropogenic factors such as roads, poor grazing practices, and habitat invasion by nonnative species have led to the loss and degradation of aquatic resources. Additionally, the expansion of roads and urbanization have resulted in habitat fragmentation and a decrease in connectivity between habitats that support different life stages, and the contribution of 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 2015, 2016a). In the GAI, the majority of urbanization and development has occurred in the central western portion between Interstate 5 and State Route 99, and south of Interstate 80 (Figure 2-6).

Habitat loss, fragmentation, and degradation have been described as a factor in the decline of longfin smelt, delta smelt, Chinook salmon, and steelhead (California Department of Fish and Game 2009; FWS 2004; NMFS 2016a, 2016c). Reduction of spawning habitat is described as the principal factor in the decline of the Southern DPS of green sturgeon (NMFS 2021a).

8.5.2. Invasive Species

Transportation projects and associated ongoing maintenance activities have the potential to introduce and/or spread nonnative, invasive species. When invasive, nonnative species enter an ecosystem, they can disrupt the natural balance, resulting in a reduction of biodiversity, degradation of habitats, alteration of native genetic diversity, shifting of

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

wetland type, disruption of aquatic and terrestrial connectivity, and further threats to already endangered or threatened natural resources. Invasive plant species that affect aquatic resources in the GAI include giant reed (*Arundo donax*), water hyacinth (*Eichhornia crassipes*), Himalayan blackberry (*Rubus armeniacus*), tree of heaven (*Ailanthus altissima*), hydrilla (*Hydrilla* sp.), and perennial pepperweed (*Lepidium latifolium*) (Cal-IPC 2024; CDFW 2015). Invasive wildlife species that affect riparian systems in the GAI include striped bass, black crappie, bluegill, red eared slider, Chinese mitten crab, and American bullfrog (CDFW 2015).

Invasive species known or strongly assumed to negatively affect Chinook salmon and steelhead include striped bass, smallmouth bass (*Micropterus dolomieu*), largemouth bass (*Micropterus salmoides*), American shad (*Alosa sapidissima*), giant reed, and tamarisk (NMFS 2014, 2016a, 2016b, 2016c). Invasive species known to negatively affect both delta smelt and longfin smelt include striped bass, overbite clam (*Potamocorbula amurensis*), and an exotic copepod (*Sinocalanus doerrii*) (FWS 1996). Delta smelt is also more recently negatively affected by inland silverside (*Menidia beryllina*) (FWS 2004). Overbite clam is known to negatively affect green sturgeon, and invasive invertebrates such as European green crab (*Carcinus maenas*) have affected the green sturgeon's food web (NMFS 2018, 2021a).

8.5.3. Altered Hydrology, Geomorphology, and Water Quality

Water quality and hydrology can be directly altered by physical barriers such as culverts, dams (including cofferdams), dikes, trash racks, bridges, roads, canals, and other human-made infrastructure, which can have effects both upstream and downstream by truncating connectivity, altering sediment transport processes, altering natural flow regimes, and changing water surface elevations, adding to the downstream loss of habitat. Stable geomorphology and sediment transport are critical to maintaining healthy streams so that degradation and aggradation do not destroy habitats in the stream, 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 2015, 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 2005a).

The supply of sand used by longfin smelt for spawning has been reduced by the placement of dams and water diversions, and a number of contaminants such as mercury, selenium, and organochlorines are present in their spawning areas (California Department of Fish and Game 2009). Selenium is also listed as a potential factor for green sturgeon (NMFS 2021a). Changes in hydrology from water resource development upstream of the Sacramento River Delta are a factor in delta smelt's decline and sustained low abundance (FWS 2004), and have similarly affected Chinook salmon and steelhead (NMFS 2016a, 2016b, 2016c). Additionally, issues with water pollution in the

Sacramento River and tributaries are known as a factor in the decline of Chinook salmon (NMFS 2016a, 2016b).

8.5.4. Climate Change and Drought

Section 2.4 provided a brief overview of the GAI's climate and available planning-level predictions for climate change for the region. In the next 30 years, the climate is expected to change. Expected changes include increases in heavier-than-average precipitation events coupled with increased risk of flash flood events, sea-level rise, storm surges, and an increased risk of wildfire, which is coupled with increased flooding and erosion risk (Caltrans 2019b). The lower permeability of roads can exacerbate the risks associated with flooding and erosion.

Drought in the Sacramento Valley area affects the abilities of species to migrate to different areas by reducing resource availability in other areas, which compounds the effects of climate change. It also greatly amplifies wildfire risk (Houlton and Lund 2018).

Drought was found to be a major factor in the decline of longfin smelt as a significant reduction in juvenile fish maturing to adults was noticed after the 1987 to 1992 drought. Climate change is considered to likely affect longfin smelt habitat by changing temperatures, increasing flood events, and increasing salt concentration (California Department of Fish and Game 2009). Climate change and drought are expected to have increasingly significant effects on Chinook salmon and steelhead from reduction in snowpack flows of freshwater, increases in ambient warming, and reduced overall flows (NMFS 2016a, 2016b, 2016c).

8.5.5. Wildfire Risk

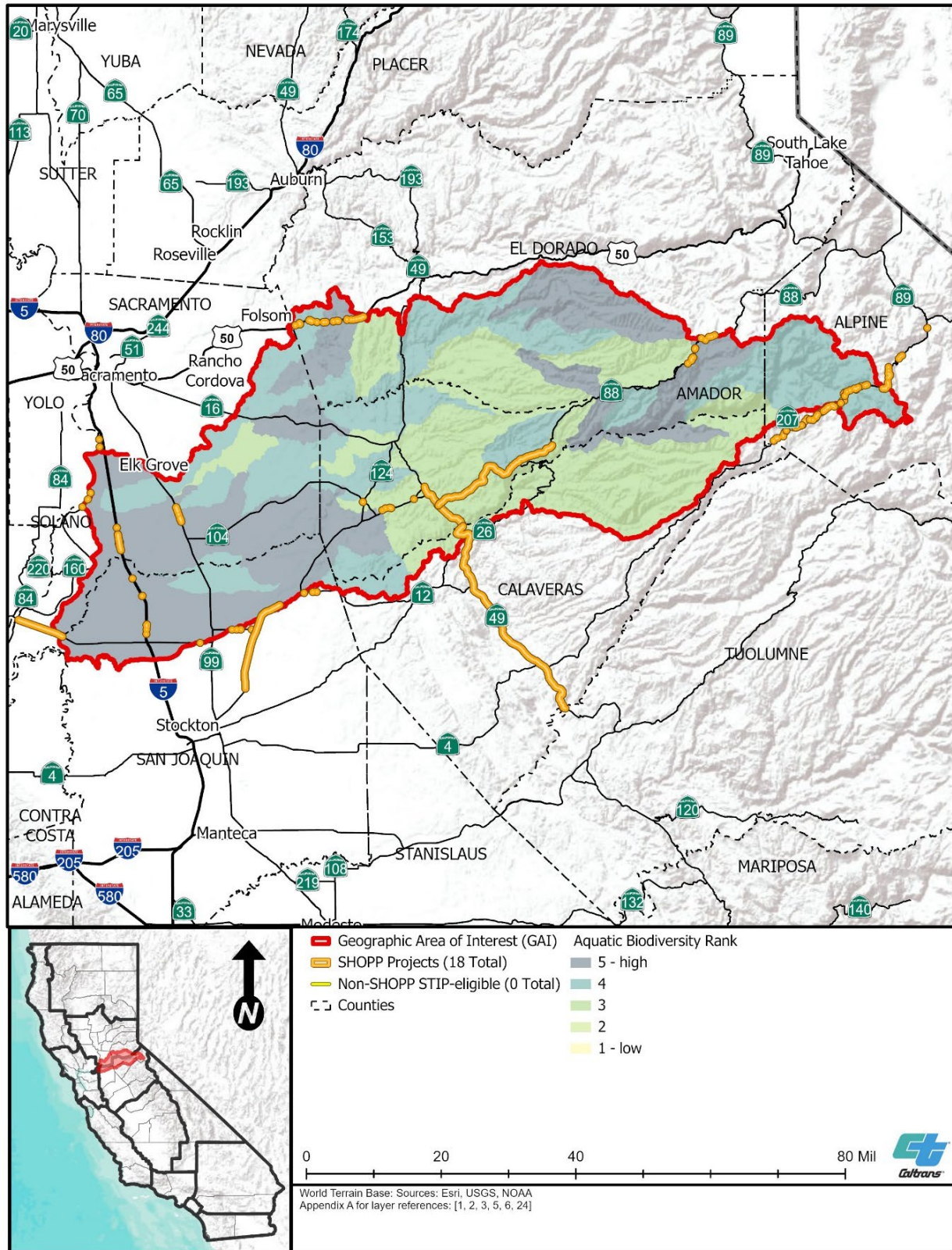
Vegetation can be altered by large-scale wildfire effects from altering microclimatic regimes, increasing runoff and river discharge, and enhancing erosion and sediment inputs, transport, and deposition. Fires can also affect the physical characteristics of riparian and wetland ecosystems by transitioning 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 2015). All of these effects would be expected to affect fish species.

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 aquatic resources.

- Figure 8-1 illustrates the regional aquatic biodiversity in the GAI, as provided by CDFW's ACE GIS dataset. According to these data, high to moderate aquatic biodiversity dominates the GAI. These areas are located along the SHS with planned SHOPP projects.

Figure 8-1. Aquatic Biodiversity of the GAI



- Enhancing and/or restoring the aquatic resources of the GAI is expected to contribute to biologically sustainable populations of special-status aquatic, wetland, and riparian plant and wildlife species. For example, 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 Lahontan cutthroat trout (*Oncorhynchus clarkii henshawi*), as well as other aquatic species such as the Wawona riffle beetle (*Atractelmis wawona*), the Ricksecker's water scavenger beetle (*Hydrochara rickseckeri*), and Sanford arrowhead (*Sagittaria sanfordii*).
- 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 waterways could sequester contaminants on waterways identified as 303(d) impaired and/or with an established TMDL.

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

8.7 Advance Mitigation Conservation Goals and Objectives

The conservation goals and objectives compiled in Table 8-4 are intended to be relevant to anticipated future SHOPP transportation project compensatory mitigation needs, be consistent with the goals and objectives of natural resource regulatory agencies for aquatic resources, address pressures and stressors on aquatic resources, and support mitigation success in the GAI. Each conservation goal is supported by one or more conservation objective; objectives are more specific, measurable, achievable, relevant, and time-bound measures that align to a desired result specified by a goal. At the broad scale, these aquatic 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, objectives, and sub-objectives presented in Table 8-4 reflect Caltrans' intention to develop advance mitigation project scopes for in-kind mitigation and are intended to reflect 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—a topographic watershed-based system depending on the size and location of a transportation or other project (Corps 2015). The Water Boards generally subscribe to an approach for compensatory mitigation decisions that follows the Corps' watershed approach; however, the HU classification system may be used on a case-by-case basis (SWRCB 2019).

Fish barrier removal priorities exist both on and off the SHS. However, on-system fish passage barriers take priority over off-system barriers until such time that no feasible on-system barriers exist. Caltrans and CDFW agree to a collaborative barrier prioritization process through the FishPACs. This prioritization is updated each year in the *Fish Passage Annual Legislative Report* (Caltrans 2021). The priorities on the SHS are dynamic, changing as they are addressed and as funding becomes available.

For the SHS, priority barriers are determined in coordination with the six regional FishPACs and reported to the Legislature in October of each year, in accordance with SHC § 156.1-3 (Senate Bill 857, Kuehl, Chapter 589, Statutes of 2005). Priority fish passage barriers currently account for an estimated 330 miles of currently blocked habitat for threatened and endangered salmon and steelhead along the California coastline and inland Central Valley. Full-span solutions allow Caltrans to reduce the overall number of known barriers on the SHS, provide access to the highest-quality habitat, and reduce rework and partial solutions, which require long-term monitoring and costly maintenance until the end of the facility's service life—when the full-span solution will be required. Priority locations are ranked by considering a species' listing status and diversity, quality and quantity of habitat for recovery, and related best professional knowledge. FishPAC's subject matter experts include CDFW, NMFS, FWS, CCC, CalTrout, Pacific States Marine Fisheries Commission, other local fish passage advocates, and Caltrans.

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 to area, functions, values, and condition of wetland and non-wetland water resources.	See below	See below
Objective AR-1.1: Improve quality and function of wetland and non-wetland water resources.	Sub-Objective AR-1.1.1: Enhance and/or rehabilitate wetland and non-wetland water resources such that the greatest functional lift to the aquatic resource is provided, including by consolidating compensatory mitigation consistent with Executive Order W-59-93. 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, CDFW recovery plans, and other land management plans identified in Table 8-3. Sub-Objective AR-1.1.3: Prioritize enhancement and/or restoration of riparian vegetation in the HUC-8s of the GAI, particularly Deer Creek and Willow Slough, the Cosumnes and Mokelumne Rivers, as well as other named and unnamed tributaries, many of which are listed in Table 8-2. Sub-Objective AR-1.1.4: Enhance and/or rehabilitate wetland and non-wetland water resource functions, such as connectivity, abundance of native plants, stream geomorphology, hydrologic regime, substrate diversity and complexity, and water quality, that define habitat value for aquatic organisms and increase basin-wide value of resources.	▪ <i>303(d) List of Impaired Water Bodies</i> (SWRCB 2021) ▪ <i>American River Basin Integrated Regional Water Management Plan</i> (Regional Water Authority 2018) ▪ <i>California Wetlands Conservation Policy</i> (Executive Order W-59-93) ▪ <i>Cosumnes River Reserve Management Plan</i> (SWRCB 2008) ▪ <i>Delta Smelt Resiliency Strategy</i> (CDFW 2016d) ▪ <i>Eagle Lake Field Office Proposed Resource Management Plan and Final Environmental Impact Statement</i> (BLM 2007) ▪ <i>Groundwater Sustainability Plan Cosumnes Subbasin</i> (EKI Environment and Water, Inc. 2021) ▪ <i>Final 2022 Prairie City State Vehicular Recreation Area Wildlife Habitat Protection Plan</i> (California State Parks 2022) ▪ <i>Integrated Regional Water Management Plan Cosumnes American Bear Yuba Watersheds, California</i> (Cosumnes, American, Bear, and Yuba River Regional Water Management Group 2021) ▪ <i>Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update</i> (Upper Mokelumne River Watershed Authority 2024) ▪ <i>National Wetlands Mitigation Action Plan</i> (EPA and Corps 2002) ▪ <i>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</i> (NMFS 2014) ▪ <i>Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes</i> (FWS 1996) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005a) ▪ <i>Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement</i> (USFS 2004) ▪ <i>Stanislaus National Forest – Forest Plan Direction</i> (USFS 2017) ▪ <i>State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State</i> (SWRCB 2019) ▪ <i>Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan</i> (FWS 2007) ▪ <i>SWAP</i> (CDFW 2015) ▪ <i>Water Quality Control Plan for the Central Valley Basin</i> (Central Valley RWQCB 2018)
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 water aquatic resources, particularly in key wetland and non-wetland water habitats that are identified in the SWAP, FWS recovery plans, CDFW 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 of the GAI, particularly in the Mokelumne and Cosumnes Rivers, Deer Creek, Dry Creek, Coyote Creek, and Badger Creek as well as other named and unnamed tributaries into the Cosumnes, Bear, and Mokelumne Rivers, many of which are listed in Table 8-2.	▪ All documents noted for 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: Restore and/or enhance water quality.	Sub-Objective AR-2.1.1: In coordination with the RWQCB, restore and/or enhance wetland and non-wetland waters with RWQCB biology-related beneficial use designations, such as cold freshwater habitat; freshwater replenishment; spawning, reproduction, and/or early development; warm freshwater habitat; and wildlife habitat. Sub-Objective AR-2.1.2: In coordination with natural resource regulatory agencies, address aggradation, erosion, nutrients, contaminants, sedimentation, and temperatures in the HUC-8s identified in Table 8-2. Sub-Objective AR-2.1.3: In coordination with the RWQCB, implement habitat restoration and enhancement actions that address water quality for aquatic resources, for example, at Antelope Creek, Cache Creek, Deer Creek, Stony Creek, Bear River, and vernal pools. Sub-Objective AR-2.1.4: Restore and/or enhance areas upstream of places with high water quality protection and remediation values, such as areas of special biological significance. Sub-Objective AR-2.1.5: 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-2.1.6: Rehabilitate and/or enhance small streams and sections of larger streams to remove nonnative plant species that degrade stream water quality, such as giant reed, perennial pepperweed, water hyacinth, and nonnative water primroses. Sub-Objective AR-2.1.7: Improve stream temperatures by increasing shaded riverine aquatic habitat in the Cosumnes, Bear, and Mokelumne Rivers for fish and other aquatic life.	▪ <i>Delta Adapts: Creating a Climate Resilient Future</i> (Delta Stewardship Council 2024a) ▪ <i>The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value</i> (Delta Stewardship Council 2024b) ▪ <i>2014 Eastern San Joaquin Integrated Regional Water Management Plan Update</i> (Eastern San Joaquin County Groundwater Basin Authority 2014) ▪ <i>303(d) List of Impaired Water Bodies</i> (SWRCB 2021) ▪ <i>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</i> (NMFS 2014) ▪ <i>Stanislaus National Forest – Forest Plan Direction</i> (USFS 2017) ▪ <i>Water Quality Control Plan for the Central Valley Basin</i> (Central Valley RWQCB 2018)
Objective AR-2.2: Improve surface water hydrology.	Sub-Objective AR-2.2.1: Restore and/or enhance natural hydrologic regimes, natural sediment transport, and geomorphic processes. Sub-Objective AR-2.2.2: Reconnect severed aquatic systems and improve connectivity in aquatic and riparian systems, with particular focus on reconnecting higher watershed areas with lower watershed areas, such as reconnecting tributaries to the Cosumnes, Bear, and Mokelumne Rivers. Sub-Objective AR-2.2.3: Reestablish hydrologic regimes or drainage patterns for better function of depressional, freshwater emergent wetland, freshwater forested/shrub wetland, individual vernal pool, vernal pool system, freshwater pond, lake, and riverine habitats.	▪ <i>303(d) List of Impaired Water Bodies</i> (SWRCB 2021) ▪ <i>American River Basin Integrated Regional Water Management Plan</i> (Regional Water Authority 2018) ▪ <i>Delta Smelt Resiliency Strategy</i> (CDFW 2016d) ▪ <i>Final 2022 Prairie City State Vehicular Recreation Area Wildlife Habitat Protection Plan</i> (California State Parks 2022) ▪ <i>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</i> (NMFS 2014) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005a) ▪ <i>Sierra Nevada Forest Plan Amendment Final Supplemental Environmental Impact Statement</i> (USFS 2004)

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
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 adjacent to streams to enhance groundwater-surface water dynamics in tributaries.	▪ <i>Groundwater Sustainability Plan Cosumnes Subbasin</i> (EKI Environment and Water, Inc. 2021)
Goal AR-3: Restore 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 years' Fish Passage Annual Report to 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>Caltrans Fish Passage Annual Legislative Report</i> (Caltrans 2021) ▪ <i>Delta Adapts: Creating a Climate Resilient Future</i> (Delta Stewardship Council 2024a) ▪ <i>The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value</i> (Delta Stewardship Council 2024b) ▪ <i>Department of Fish and Game Report to the Fish and Game Commission: A Status Review of the Longfin Smelt</i> (<i>Spirinchus thaleichthys</i>) in California (California Department of Fish and Game 2009) ▪ <i>Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update</i> (Upper Mokelumne River Watershed Authority 2024) ▪ <i>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</i> (NMFS 2014) ▪ <i>Recovery Plan for the Sacramento-San Joaquin Delta Native Fishes</i> (FWS 1996) ▪ <i>Recovery Plan for the Southern Distinct Population Segment of North American Green Sturgeon</i> (<i>Acipenser medirostris</i>) (NMFS 2018) ▪ <i>Stanislaus National Forest – Forest Plan Direction</i> (USFS 2017) ▪ <i>Steelhead Restoration and Management Plan for California</i> (California Department of Fish and Game 1996) ▪ <i>SWAP</i> (CDFW 2015)

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
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 central portion of the GAI, 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 and sea-level rise such as aquatic features with hydrologic connection to the Mokelumne, Cosumnes, and Bear Rivers, as well as Antelope, Dry, Mill, Stony, and Clear Creeks, such that the potential for aquatic resource migration increases. Sub-Objective AR-4.1.3: Prioritize riparian areas of the HUC-8s identified in Table 8-2 and implement improvements that involve enhancement and/or restoration to improve freshwater quantity and quality, floodplain connectivity, and instream cover continuity. Sub-Objective AR-4.1.4: Enhance, rehabilitate, establish and/or reestablish aquatic habitats by using native species such as Fremont’s cottonwood (<i>Populus fremontii</i>), white alder (<i>Alnus rhombifolia</i>), willows (<i>Salix</i> sp.), cattails (<i>Typha</i> spp.), rushes (<i>Juncus</i> sp.), and bulrushes (<i>Schoenoplectus</i> sp.) 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 the Mokelumne, Cosumnes, and Bear Rivers, and streams associated with the Central Valley Basin. Sub-Objective AR-4.1.6: Prioritize habitat establishment and reestablishment in areas that can also reduce risk in floodprone systems, in particular areas along the Mokelumne, Cosumnes, and Bear Rivers, and Antelope, Dry, Mill, Stony, and Clear Creeks.	▪ <i>American River Basin Integrated Regional Water Management Plan</i> (Regional Water Authority 2018) ▪ <i>Cosumnes River Reserve Management Plan</i> (SWRCB 2008) ▪ <i>Delta Adapts: Creating a Climate Resilient Future</i> (Delta Stewardship Council 2024a) ▪ <i>The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value</i> (Delta Stewardship Council 2024b) ▪ <i>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</i> (NMFS 2014) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005a) ▪ <i>Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan</i> (FWS 2007) ▪ <i>SWAP</i> (CDFW 2015)
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, cattails, and willows. Sub-Objective AR-4.2.2: Prioritize management of invasive species that occur in large contiguous areas in aquatic habitats, such as New Zealand mud snails, water perennial pepperweed, and nonnative water primroses that may be exacerbated by climate change such that the greatest functional lift is provided. Sub-Objective AR-4.2.3: Enhance and/or restore small (that is, low order) tributaries/streams that discharge into larger rivers such as the Mokelumne, Cosumnes, and Bear Rivers.	▪ <i>American River Basin Integrated Regional Water Management Plan</i> (Regional Water Authority 2018) ▪ <i>Cosumnes River Reserve Management Plan</i> (SWRCB 2008) ▪ <i>Delta Smelt Resiliency Strategy</i> (CDFW 2016d) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005a) ▪ <i>Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan</i> (FWS 2007) ▪ <i>SWAP</i> (CDFW 2015)

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
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 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>American River Parkway Natural Resource Management Plan</i> (Sacramento County and Sacramento County Regional Parks 2021) ▪ <i>Cosumnes River Reserve Management Plan</i> (SWRCB 2008) ▪ <i>Delta Adapts: Creating a Climate Resilient Future</i> (Delta Stewardship Council 2024a) ▪ <i>The Delta Plan: Ensuring a Reliable Water Supply for California, a Healthy Delta Ecosystem, and a Place of Enduring Value</i> (Delta Stewardship Council 2024b) ▪ <i>Final 2022 Prairie City State Vehicular Recreation Area Wildlife Habitat Protection Plan</i> (California State Parks 2022) ▪ <i>Mokelumne/Amador/Calaveras Integrated Regional Water Management Plan Update</i> (Upper Mokelumne River Watershed Authority 2024) ▪ <i>Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon</i> (FWS 2005a) ▪ <i>Stanislaus National Forest – Forest Plan Direction</i> (USFS 2017) ▪ <i>Stone Lakes National Wildlife Refuge Comprehensive Conservation Plan</i> (FWS 2007) ▪ <i>SWAP</i> (CDFW 2015)

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8.8 Summary

Caltrans anticipates that future SHOPP 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. The pressures and stressors include:

- habitat loss, fragmentation, and degradation;
- invasive species;
- altered hydrology, geomorphology, and water quality;
- climate change and drought; and
- wildfire risk.

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

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

- **Goal AR-1** seeks to achieve no net loss of area, functions, values, and the condition of wetland and non-wetland water resources in the GAI. The primary objectives associated with this goal are to improve existing wetland and non-wetland water resources and create new ones. The sub-objectives were selected to address the following pressures and stressors: altered hydrology, geomorphology, and water quality; habitat loss, fragmentation, and degradation; invasive species; and wildfire risk.
- **Goal AR-2** seeks to restore and maintain the chemical, physical, and biological integrity of waters. The primary objectives associated with this goal are to restore and/or 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 restore or enhance and expand habitat for fish species of mitigation need. The primary objective associated with this goal is to restore and/or enhance habitat. The sub-objectives were selected to address habitat restoration and enhancement actions, and to implement FishPAC and legislative priorities.
- **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 to improve aquatic habitat climate resiliency. The sub-objectives were selected to address the following pressures and stressors: climate change, 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-objectives of this goal describe what additional benefits exist for other resources in the GAI, including benefits to upland terrestrial habitat. Goal AR-5 was developed to include conservation for multiple resources while seeking to address in-kind transportation projects' effects on aquatic resources.

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

9. ASSESSMENT OF AUTHORIZED ACTIVITIES

Informed by this RAMNA and its reviewers' comments and feedback, Caltrans District 3 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 3 with scoping of SHC § 800.6(a)-authorized activities to be considered further for potential funding by the AMA (see Step 4 of Figure 1-1 and Section 9.4).

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

9.1 Overview of Advance Mitigation Project Scope Development

Advance mitigation project scopes will provide enough information, at the appropriate level of detail, for the Caltrans Director to concur with funding. Appropriately, advance mitigation project scopes will address transportation project delivery acceleration and environmental objectives:

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

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

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

Advance mitigation project scopes must:

Be an authorized activity in accordance with SHC § 800.6(a).

Benefit multiple transportation projects' delivery schedules.

Deliver mitigation anticipated to be needed to fulfill the mitigation requirements of transportation improvements.^a

Be consistent with natural resource regulatory agency goals and objectives.

Yield mitigation in units and terms approved by natural resource regulatory agencies with the authority to condition transportation project permits with compensatory mitigation.

Employ, as appropriate, existing applicable state and federal standards and instruments, mitigation-related agreements, advance mitigation project-specific agreements,^{b,c} and contracts with qualified third parties.^d

Address overlapping mitigation requirements.

Implement the state's competitive proposal and bidding processes, 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 transportation projects to natural resources is shown on figures throughout this document; non-SHOPP, STIP-eligible projects were not identified for the planning period, and so are not shown. 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 3 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 2026/27), mitigation that can be purchased or established by fiscal year 2028/29 (within the next 2 years) could potentially address approximately:

- 1.0 acre of giant garter snake habitat and 0.8 acre of Swainson's hawk habitat impacts in the Great Valley Ecoregion Section, potentially contributing to the acceleration of 2 and 2 transportation projects, respectively
- 0.2 acre of fish habitat, 0.6 acre of non-wetland waters, 0.5 acre of vernal pools, and up to 2.8 acres of area of potential riparian function in the Upper Mokelumne sub-basin, potentially contributing to the acceleration of 2, 3, 1, and 3 transportation projects, respectively

All or some of these needs could form the basis for Caltrans District 3 to develop an advance mitigation project scope.

9.3 Authorized Activity Summary

Advance mitigation project scope options that have a high probability of successfully meeting the AMP's objectives are feasible. Below, a brief description of each of the 11 SHC § 800.6(a)-authorized advance mitigation project types is provided, followed by a discussion of its feasibility. Listed in Table 9-3, some advance mitigation project types are not currently feasible because they are not available in the GAI. Others are not currently feasible because a regulatory and administrative pathway is not available. Still others have potential but may not be feasible to implement on a schedule to contribute to accelerated transportation project delivery. Further, the activity authorized by SHC § 800.6(a)(4) is only feasible if § 800.6(a)(1)–(3) options are not feasible. Results of the feasibility analysis are summarized in the subsections below, and in Table 9-4 (wildlife resources) and Table 9-5 (aquatic resources) later in this chapter.

Table 9-3. Advance Mitigation Project Types^a

Advance Mitigation Project Type	Authorization	Section
Caltrans pays mitigation fees or other costs or payments associated with coverage of transportation projects under an approved NCCP ^b and/or an approved HCP.	SHC § 800.6(a)(2)	9.3.1
Caltrans purchases credits from an existing conservation bank.	SHC § 800.6(a)(1)	9.3.2
Caltrans purchases credits from an existing mitigation bank.	SHC § 800.6(a)(1)	9.3.3
Caltrans purchases credits from an existing in-lieu fee program.	SHC § 800.6(a)(1)	9.3.4
Caltrans purchases credits developed through an MCA, established under a CDFW-approved RCIS. ^c	SHC § 800.6(a)(3)(A)	9.3.5
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated conservation bank, in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)	9.3.6
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated mitigation bank in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)	9.3.7
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated in-lieu fee program in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)	9.3.8
Caltrans funds the implementation of conservation actions and habitat enhancement actions ^{c,d} to generate mitigation credits pursuant to an MCA ^b established under a CDFW-approved RCIS. ^c The scope may include Caltrans first entering into or funding the preparation of an MCA. ^c The scope may also include Caltrans first entering into or funding the preparation of an RCIS. ^c	SHC § 800.6(a)(3) SHC § 800.6(a)(3)(A)	9.3.9

Advance Mitigation Project Type	Authorization	Section
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

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

Caltrans is a Participating Transportation Agency to one NCCP/HCP with a plan area that overlaps the GAI and includes transportation-related projects (Table 4-2, Figure 4-1).

Feasibility. 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,¹ at which point, the credits or values would be available to transportation projects.

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. Twenty-two conservation banks have service areas that at least partially overlap the GAI. Of these, CDFW is a signatory to 10 active and 2 pending conservation banks, 11 of which offer credits for at least 1 of the species of mitigation need (Table 4-3). FWS is a signatory to 19 active and 2 pending conservation banks, 17 of which offer

¹ Caltrans contracting processes and agency interactions are incorporated into this time estimate.

credits for at least 1 species of mitigation need. CDFW and FWS are cosignatories to 10 active and 2 pending of the conservation banks referenced above.

Conservation bank service areas are shown in Appendix H, *Conservation and Mitigation Bank Service Areas*, and the anticipated transportation project impact forecast on terrestrial species of mitigation need is presented by year on Figures 6-2 through 6-4. 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 2026/27, when the credits might contribute to transportation project acceleration.

Feasibility. This authorized activity may be feasible. Caltrans District 3 may be able to address some of its giant garter snake and Swainson's hawk mitigation need through credits purchased previously through the SHOPP (Table 4-1). However, additional purchases to address other needs may be made. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years, at which point the credits or values would be available to transportation projects. The Caltrans District will need to approach each bank to confirm the availability of credits and bulk credit purchase terms. Bulk credits purchased through an advance mitigation project might, with CDFW approval, be applied to meet future CDFW permit conditions on transportation projects. Since the giant garter snake is a dually listed species, it is probable that compensatory mitigation will be incorporated into future FESA biological assessments/opinions in coordination with FWS. Pre-permit purchases must be authorized in a BEI for this authorized activity to be feasible. For existing banks, a BEI amendment would be required to formalize a process for bulk pre-permit credit purchases, which must be completed before undertaking this authorized activity. The decision to amend a BEI is at the discretion of the bank sponsor and, if needed, additional Caltrans-specific terms would also need to be negotiated with bank sponsors.

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. Ten mitigation banks in the GAI provide wetland and/or non-wetland water credits; the Corps is a signatory to all of them (Table 4-3). In addition, many of these mitigation banks offer credits for species of mitigation need.

Feasibility. 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. The mitigation bank service areas are shown in Appendix H, *Conservation and Mitigation Bank Service Areas*, and the anticipated transportation project impact forecast to aquatic resources is shown in Figures 6-5 and 6-6. Pre-permit purchases must be authorized in the BEI for this authorized activity to be feasible. Pre-permit credit purchases are included in the BEI for one of the existing mitigation banks

(Bullock Bend), and an amendment to the BEI that would allow pre-permit credit purchases is pending for the Elsie Gridley Mitigation Bank. However, for most existing banks, a BEI amendment would be required to formalize a process for bulk pre-permit credit purchases, which must be completed before undertaking this authorized activity. The decision to amend a BEI is at the discretion of the bank sponsor and, if needed, additional Caltrans-specific terms would also need to be negotiated with bank sponsors.

9.3.4. In-lieu Fee Credit Purchase

In-lieu fee programs are discussed in Section 4.4.² 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.³ The in-lieu fee program's alignment with natural resource protection is documented through its enabling instrument and will be incorporated into future biological opinions on transportation projects.

There is one active in-lieu fee program with a service area that overlaps the GAI: the NFWF Sacramento District In-Lieu Fee Program (Figure 4-2). This in-lieu fee program's enabling instrument includes allowances for pre-transfer credit purchases.

Feasibility. This authorized activity is feasible. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years, at which point the credits or values would be available to transportation projects. Bulk credits purchased from an 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.⁴ There are no approved or pending RCISs with service areas that overlap the GAI. Therefore, no MCAs have been developed in the GAI.

Feasibility. At this time (July of fiscal year 2026/27), this authorized activity is not feasible because no MCA credits are available for purchase in the GAI.

² 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>

³ https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/banking_faq.pdf

⁴ <https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation>

9.3.6. Conservation Bank Establishment

Instructions and guidance for establishing conservation banks are available from CDFW⁵ and FWS.⁶ Conservation banks are species-focused, and each bank's alignment with wildlife 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, *Wildlife Resources Conservation Goals and Objectives*, Caltrans analyzed and synthesized the relevant and applicable information listed in Chapter 3, *Relevant Plans, Policies, and Regulations*, to develop its understanding of natural resource regulatory agency goals and objectives for the GAI. In brief, it is Caltrans' understanding that a conservation bank that addresses the following goals would be consistent with CDFW and FWS goals:

- Conserve and expand habitat for species of mitigation need 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 habitat supporting species of mitigation need to allow for dispersal that will maintain resilience and variability of populations (WILD-2).
- 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 wildlife resources through transportation project mitigation.

⁵ <https://wildlife.ca.gov/Conservation/Planning/Banking/Templates>

⁶ <https://www.fws.gov/service/conservation-banking>

Feasibility. This authorized activity may be feasible. As stated 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*

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

Mitigation banks are wetland- and waters-focused, and each bank's alignment with aquatic 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

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

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

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 to area, functions, values, and condition of wetland and non-wetland water resources⁹ (AR-1).
- Restore and/or enhance the chemical, physical, and biological integrity of wetlands and non-wetland waters (AR-2).
- Restore 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 aquatic resources through transportation project mitigation.

Feasibility. This authorized activity may be feasible. As discussed above, instructions and guidance for establishing mitigation banks are available from the Corps and CDFW and, 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.¹⁰ 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*

⁹ Preservation alone is not recognized by the Corps or RWQCB as providing no net loss.

¹⁰ <https://www.spl.usace.army.mil/Missions/Regulatory/Mitigation/>

- Appendix G, *Aquatic Resource Locations*

To support future transportation project permits, Caltrans would seek CWA credit establishment under the Corps (WOTUS) and RWQCB's (waters of the state) jurisdiction. 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.

At this time, Caltrans cannot be an MCA sponsor.¹¹ 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.

¹¹ CDFW's legislation requires that MCA securities take the form of a letter of credit or cash according to FGC § 1856 subdivision (g)(17), which includes and references all of § 1798.5 subdivision (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.

- 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.¹²

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 credits¹³ 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.¹⁴ 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 2026/27), RCIS program guidelines, which include guidance for the creation of MCAs, are available (CDFW 2023).¹⁵ 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 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 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

¹² 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.

¹³ Caltrans is the Lead Agency under CEQA; CDFW's permitting authority does not include conditioning transportation projects under CEQA (Section 7).

¹⁴ Parallel evaluations are undertaken when, for the same environmental enhancement/action, two or more agencies must employ different mechanisms to approve the credits.

¹⁵ <https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation>

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 preservation¹⁶ 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 2026/27), this authorized activity is not feasible because no RCIS programs are established in the GAI. A supportive regulatory and administrative pathway for a natural resource regulatory agency to recognize credits or values outside 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.

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

¹⁶ SWRCB does not typically approve establishment of or accept preservation credits.

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 2026/27), 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 2023/24 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 2026/27), a few authorized activities appear to be feasible and, under several scenarios, advance mitigation project scopes could cover multiple resources and address overlapping natural resource regulatory agency jurisdictions (see Section 9.2). Under some conditions, establishing new mitigation credits through existing mechanisms may also be possible.

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 and/or HCP fees	Yes	Yes, there is 1 active NCCP/HCP with valley elderberry longhorn beetle, California red-legged frog, foothill yellow-legged frog, giant garter snake, and/or Swainson's hawk credits	Yes, CDFW and FWS	1 to 3 years
Purchase conservation bank credits	Yes, may require instrument amendment	Yes, 17 active or pending FWS-approved banks, 4 NMFS-approved banks, and 12 CDFW-approved banks in the GAI with California red-legged frog, Swainson's hawk, valley elderberry longhorn beetle, Chinook salmon, delta smelt, green sturgeon, longfin smelt, and/or steelhead credits	Yes, CDFW and FWS for dually listed species	1 to 3 years
Purchase in-lieu fee program credits	No	No, although there is one in-lieu fee program in the GAI, it is not approved by FWS and does not offer species-specific credits	Not available	Not available
Purchase MCA credits	No	Not available	Not available	Not available
Establish conservation bank	Yes	Yes, with CDFW, FWS, and NMFS	Yes, with CDFW, FWS, NMFS	2 to 6 years
Establish in-lieu fee program	Yes	Yes, with FWS and NMFS	Yes, with FWS and NMFS Potential to align with Corps in-lieu fee program	2 to 6 years
Establish MCA credits or values	No	Not available	Not available	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 ^b	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, no RCISs established in the GAI	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.

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, 10 mitigation banks have service areas that overlap the GAI	Yes, Corps, EPA, RWQCB, CDFW, FWS, and NMFS	1 to 3 years
Purchase in-lieu fee credits ^b	Yes	Yes, there is one Corps in-lieu fee program in the GAI	No	1 to 3 years
Purchase MCA credits	No	Not available	Not available	Not available
Establish mitigation bank	Yes	Yes, Corps, EPA, RWQCB, CDFW, FWS, and NMFS	Yes, Corps, EPA, RWQCB, CDFW, FWS, and NMFS	2 to 6 years
Establish in-lieu fee program	Yes	Yes, Corps, EPA, RWQCB, FWS, and NMFS	Maybe, Corps, FWS, NMFS, EPA, and RWQCB	2 to 6 years
Establish MCA credits or values ^c	No, not at this time	There are no RCISs in the GAI; RCISs are a requirement for MCA creation	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 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

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

^a Caltrans contracting processes and agency interactions are incorporated into this time estimate.

^b Applies to the purchase of in-lieu fee credits at in-lieu fee programs associated with an HCP/NCCP.

^c Either Caltrans or a third party would be the signatory with CDFW.

9.4 Next Steps

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

Caltrans District 3 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 3 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, Caltrans District 3 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.

Caltrans District 3 will submit a nominated advance mitigation project's scope, schedule, and budget to the Caltrans Director for approval. When the Director concurs and funding is approved, Caltrans District 3 will commit to delivering the advance mitigation project within the scope, schedule, and budget communicated with nomination materials. At that point, Caltrans District 3 will initiate project delivery (see Steps 6 through 10 on Figure 1-2; Caltrans 2019a). 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, MCAs, and the identification of new acquisitions. When a competitive bid process is used, sites are subject to what bid respondents put forward in their proposals. Site selection should be consistent with appropriate conservation goals and objectives identified in Chapter 7, *Wildlife Resources Conservation Goals and Objectives*, and Chapter 8, *Aquatic Resources Conservation Goals and Objectives*.
- When appropriate for the advance mitigation project type, it may be necessary to identify the steps required to meet the goal of satisfying overlapping jurisdictional mitigation requirements.
- Instruments and advance mitigation project-specific interagency agreements will specify the terms of use of the credits, including the service areas. Service areas will be defined based on feedback from the natural resource regulatory agencies. It is intended for the ecological units used for this RAMNA to lead to ecologically based advance mitigation project scopes and service areas; Caltrans uses HUC-8 sub-basins to be consistent with the 2008 Mitigation Rule and ecoregions to be consistent with the SWAP.

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

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