ADVANCE MITIGATION PROGRAM

Klamath Mountains Ecoregion Section Overlapping Caltrans District 2 Regional Advance Mitigation Needs Assessment

Version 1.0

Establishing Caltrans' Need for Advance Mitigation for Caltrans District 2 and Caltrans District 1 for the Klamath Mountains Ecoregion Section forecast fiscal years 2021/2022 to 2030/2031

California Department of Transportation – District 2

February 2023

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LIST OF ACRONYMS

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

HU	hydrologic unit
HUC	hydrologic unit code
HUC-4	hydrologic unit code four-digit
HUC-6	hydrologic unit code six-digit
HUC-8	hydrologic unit code eight-digit
HUC-12	hydrologic unit code twelve-digit
MCA	mitigation credit agreement
MPO	metropolitan planning organization
NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
NFWF	National Fish and Wildlife Foundation
NMFS	National Marine Fisheries Service
NPS	National Park Service
RAMNA	Regional Advance Mitigation Needs Assessment
RCIS	regional conservation investment strategy
RTPA	regional transportation planning agency
RWQCB	Regional Water Quality Control Board
SAMNA	Statewide Advance Mitigation Needs Assessment
SAMNA Reporting Tool	Statewide Advance Mitigation Needs Assessment Reporting Tool
SHC	Streets and Highways Code
SHOPP	State Highway Operation and Protection Program
SHOPP Ten-Year Book	*State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2021/22—2030/31*
SHS	State Highway System
STIP	State Transportation Improvement Program
SWAP	State Wildlife Action Plan
SWRCB	State Water Resources Control Board
TMDL	total maximum daily load
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
WOTUS	waters of the U.S.

EXECUTIVE SUMMARY

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

Background. In 2017, California Streets and Highways Code ("SHC") § 800 et seq. was amended to create the AMP within Caltrans and to provide the seed capital for an Advance Mitigation Account ("AMA"), to be operated by Caltrans as a revolving account. The stated intent of the legislation was for Caltrans, through the AMP, to realize the potential of advance mitigation to "accelerate transportation project delivery" and to "protect natural resources through transportation project [compensatory] mitigation" [SHC § 800(a)]. To this end, SHC § 800.6(a) identifies 11 specific activities as authorized allowable expenditures under the AMA and provides for the AMA to be replenished under specific conditions. The 11 activities authorized by SHC § 800 et seq. consist of purchasing or establishing compensatory mitigation credits[3,4] developed through an authorized regulatory mechanism.[5] Upon delivery, the credits are expected to be both available and at hand for Caltrans and natural resource regulatory agencies to use as offsets to transportation project impacts. The actual finding, however, of a specific credit's adequacy and/or suitability to offset an impact, as well as the placement of natural resource regulatory agency compensatory mitigation conditions on transportation

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

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

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

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

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

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

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

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

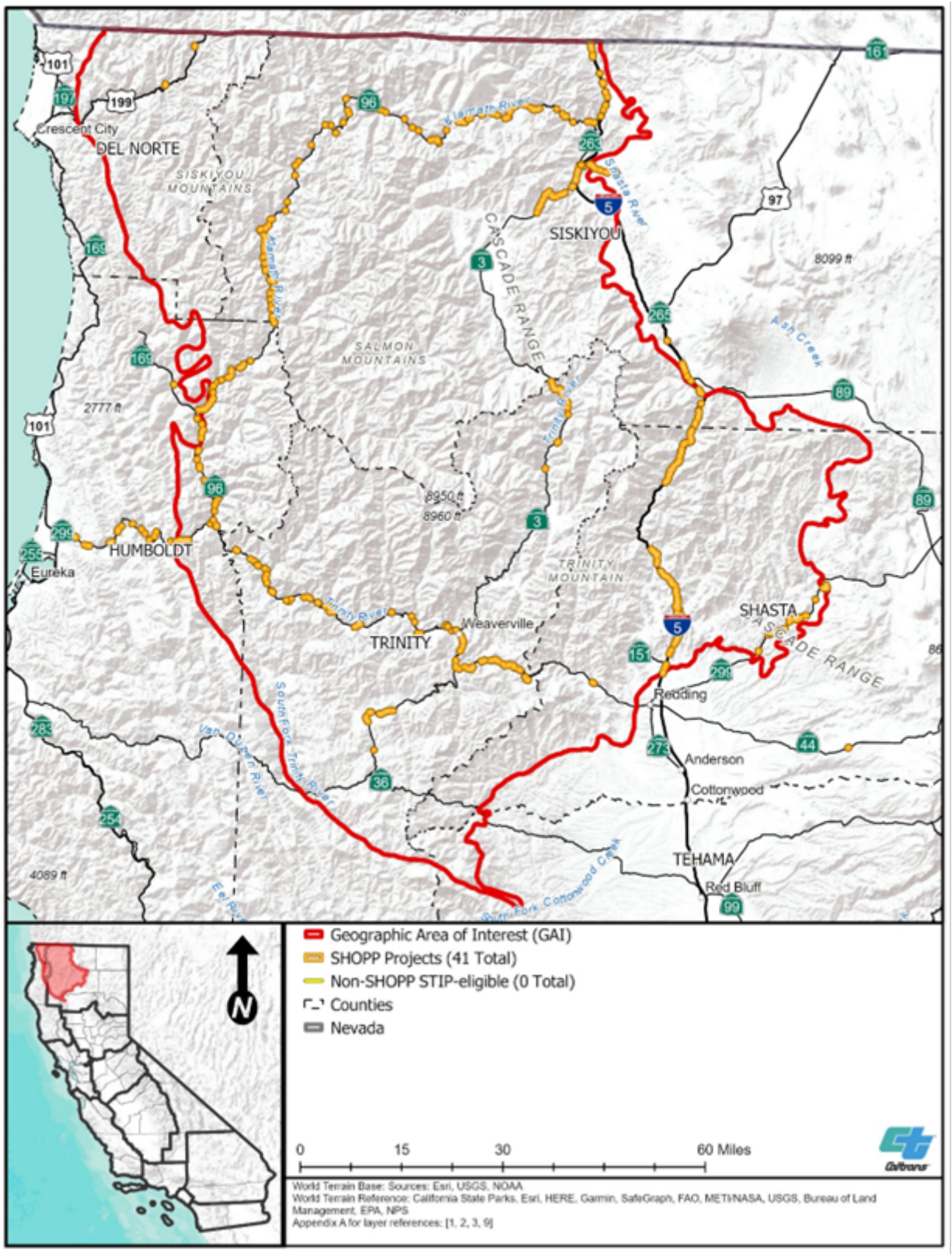
Through the RAMNA's review process, the conservation goals and objectives provided in the RAMNA were vetted with the natural resource regulatory agencies. Caltrans thinks incorporating natural resource regulatory agency goals and objectives into advance mitigation project scopes improves the chances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



Planning Period. The time period assessed in this RAMNA is for fiscal years 2019/20 through 2028/29, 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 2019/20—2028/29* ("SHOPP Ten-Year Book"; Caltrans 2021a). Transportation projects in the SHOPP Ten-Year Book have not undergone the environmental and permitting process.
- Modeled compensatory mitigation needs published in the *Statewide Advance Mitigation Needs Assessment*[6] *Report Second Quarter 2019/20 Fiscal Year* ("SAMNA Report"; Caltrans 2021b). Compensatory mitigation needs in the SAMNA Report are modeled and do not reflect an environmental and permitting process.

Planning Area. The GAI assessed in this RAMNA consists of the Klamath Mountains Ecoregion Section overlapping Caltrans District 2 (Figure ES-1). GAIs are established at an ecoregion or hydrological unit code eight-digit ("HUC-8") subbasin scale to define appropriate planning areas for mitigation implementation and anticipated use areas that align with natural resource regulatory agency practices (Caltrans 2019a). Caltrans District 2, in communication with other transportation agencies, selected the GAI because SAMNA model results for fiscal years 2019/20 through 2028/29 (Caltrans 2021b) indicate that investing AMP funds to implement landscape-scale mitigation in the Klamath Mountains Ecoregion Section is likely to maximize State Highway Operation and Protection Program ("SHOPP")[7] funded transportation project acceleration while maximizing environmental benefits. Also considered were potential non-SHOPP State Transportation Improvement Program ("STIP")[8] eligible transportation project mitigation needs; however, none were identified.

Resource Focus. Because the SAMNA model forecast impacts on hundreds of species' habitats, to further focus the planning effort, Caltrans District 2 identified species for which natural resource regulatory agencies condition transportation projects with off-site compensatory mitigation and transportation projects would most likely benefit from the credits if available. These "species of mitigation need"[9] are species of mitigation need" are foothill yellow-legged frog (*Rana boylii*), Shasta and Samwel salamanders (*Hydromantes shastae* and *H. samweli*), and fisher (*Pekania pennanti*). Because forecast fish species impacts were minimal, and few transportation projects would benefit if mitigation credits were available, no fish species of mitigation need were identified.

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[6] The SAMNA Reporting Tool is a geographic information system ("GIS") overlay model developed by Caltrans to support advance mitigation planning (Caltrans 2018a).
[7] The SHOPP funds the repair and preservation, emergency repairs, safety improvements, and some highway operational improvements on the SHS. Caltrans' implements the SHOPP. SHOPP transportation projects do not typically increase capacity.
[8] The STIP, along with other programs, funds state highway improvements, intercity rail, and regional highway and transit improvements. Local and regional transportation agencies typically implement the STIP. Some STIP transportation projects may increase capacity.
[9] Species of mitigation need are selected to focus the assessment.

Compensatory mitigation for aquatic resources[10] and riparian habitat were 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 and its associated appendices. To develop an understanding of the GAI that is consistent with natural resource regulatory agency tools and references, geospatial data from the SAMNA Reporting Tool, CDFW's BIOS, and other readily available information are summarized and presented. Climate change resiliency, wildlife connectivity, biodiversity, and conserved lands are among the information presented. A critical habitat map is provided.

The GAI consists of approximately 5.6 million acres in northern California, within the Klamath Mountains Ecoregion Section. The Klamath Mountains Ecoregion Section overlapping Caltrans District 2 defines its boundary, which overlaps portions of 17 HUC-8 subbasins: Applegate, Clear Creek-Sacramento River, Cottonwood Creek, Cow Creek, Illinois, Lower Klamath, Lower Pit, Mad-Redwood, McCloud, Sacramento Headwaters, Salmon, Scott, Shasta, Smith, South Fork Trinity, Trinity, Upper Klamath.

ES.3 Relevant Plans, Policies, and Regulations

Compensatory mitigation is informed by regulatory requirements, regulatory mechanisms for credit establishment, and conservation. Laws, regulations, comprehensive plans, conservation plans, and land management plans that are applicable and relevant to the GAI will be consulted by Caltrans to inform both regional understanding and advance mitigation project scoping.

Caltrans identified 111 documents that may be relevant to advance mitigation planning and advance mitigation project delivery: 27 laws, guidelines, and regulations; 16 statewide and regional planning documents; 14 plans and permits and other documents focused on species of mitigation need; 28 state agency, federal agency, Native American tribal, and local government land management plans; 7 water resources plans and documents; 16 county, city, and local government general plans; and 3 non-governmental organization conservation and management documents. A summary and links to these documents can be found in Chapter 3.

ES.4 Existing Mitigation Opportunities

For the purposes of the RAMNA, existing mitigation opportunities are potential opportunities for Caltrans to use AMA funds to purchase compensatory mitigation credits

[10] For the purposes of this document, aquatic resources include all wetlands and non-wetland waters that may be subject to U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, State Water Resources Control Board and Regional Water Quality Control Board, and/or CDFW regulations, as well as special-status fish that may be subject to CDFW, U.S. Fish and Wildlife Service, and National Marine Fisheries Service regulations.

or values that were previously approved by one or more natural resource regulatory agencies. In accordance with SHC § 800.6(a), the approved credits or values eligible for purchase may have been established through a conservation bank, mitigation bank, natural community conservation plan ("NCCP"), habitat conservation plan ("HCP"), in-lieu fee program, or mitigation credit agreement ("MCA") developed in accordance with a CDFW-approved regional conservation investment strategy ("RCIS").

Chapter 4 presents readily available information regarding existing mitigation opportunities for the GAI. In brief, Caltrans identified no HCP/NCCPs where Caltrans is a participant or may be eligible to participate, 15 pending or active conservation and mitigation banks, one in-lieu fee program, and no MCAs. Through the RAMNA review process, however, Caltrans became aware of an RCIS in its early development stage.

Existing mitigation opportunities can also inform both regional understanding and advance mitigation project scoping because they may be expressions of resource agency conservation goals and objectives[11] and may be suitable for concurrent transportation project mitigation.

ES.5 Estimated Impacts

Prior to developing a focused advance mitigation project scope to purchase or establish mitigation credits or values, as authorized by SHC § 800.6(a), Caltrans must determine whether it needs advance mitigation credits. Since environmental and permitting processes have not yet taken place, Caltrans must rely on estimating future SHOPP transportation project[12] impacts through the SAMNA model, as well as qualitative assessments of STIP-eligible transportation project needs,[13] to define the range of its potential advance mitigation needs.

Chapter 5 provides transportation project impact estimates for fiscal years 2019/20 through 2028/29. In the GAI, 41 SHOPP transportation projects and no non-SHOPP STIP-eligible transportation projects are in their conceptualization phase for the planning period. Many of these planned transportation improvements are not forecast to affect terrestrial or aquatic resources and many forecast impacts may be avoided during transportation project delivery. Nevertheless, the compensatory mitigation estimates presented reflect the best available information about compensatory mitigation needs at this time.

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[11] 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.

[12] 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

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

Impact estimates for the species of mitigation need are summarized in Tables ES-1 and ES-2. Since natural resource regulatory agencies routinely place species of mitigation need conditions on transportation projects, it is likely that Caltrans transportation project schedules would benefit from available credits for these species. Similarly, impact estimates for wetland and non-wetland aquatic resources are summarized in Tables ES-3 and ES-4, while riparian habitat impact forecasts are provided in Table ES-5. When Caltrans scopes advance mitigation projects to establish mitigation, Caltrans intends to center the advance mitigation projects on the species of mitigation need and/or aquatic resources, and to address conservation benefits and values for other special-status terrestrial species and resources. It is likely that, if planned in the future, STIP-eligible transportation projects would have compensatory mitigation conditions placed on them by natural resource regulatory agencies, similar to conditions placed on SHOPP transportation projects.

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

Ecoregion Section	Foothill Yellow-legged Frog: Number of Caltrans SHOPP Projects[a]	Foothill Yellow-legged Frog: Estimated Habitat Impact (acres)[b]	Shasta Salamander: Number of Caltrans SHOPP Projects[a]	Shasta Salamander: Estimated Habitat Impact (acres)[b]	Fisher: Number of Caltrans SHOPP Projects[a]	Fisher: Estimated Habitat Impact (acres)[b]	Total
Klamath Mountains	38	55.8	5	4.4	29	23.9	55.9

[a] Transportation projects are listed in Appendix B.
[b] Excludes urban

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

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Bull Trout	California Central Valley DPS Steelhead	Chinook Salmon – Spring-run	Longfin Smelt	Rough Sculpin	Total[c]
Clear Creek-Sacramento River	18020154	1	0.0	0.7	0.7	0.0	0.0	**0.7**
Lower Klamath	18010209	5	0.0	0.0	0.0	0.9	0.0	**0.9**
Lower Pit	18020003	2	0.0	0.0	0.0	0.0	0.3	**0.3**
McCloud	18020004	1	0.5	0.0	0.0	0.0	0.0	**0.5**
Total	Not applicable	**9**	**0.5**	**0.7**	**0.7**	**0.9**	**0.3**	**2.4**

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

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

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Freshwater Emergent Wetland	Freshwater Forested/ Shrub Wetland	Total[b]
Cow Creek	18020151	2	0.0	0.4	**0.4**
Lower Klamath	18010209	1	0.0	<0.1	**<0.1**
Lower Pit	18020003	1	0.0	0.1	**0.1**
Sacramento Headwaters	18020005	3	0.0	<0.1	**<0.1**
Scott	18010208	1	<0.1	0.0	**<0.1**
Shasta	18010207	2	<0.1	<0.1	**0.1**
South Fork Trinity	18010212	1	0.0	0.1	**0.1**
Trinity	18010211	3	0.0	0.2	**0.2**
Upper Klamath	18010211	3	0.1	0.3	**0.3**
Total[b,c]	Not applicable	**17**	**0.1**	**1.2**	**1.3**

[a] The SAMNA forecasts impacts on wetlands for 9 of the 17 HUC-8s in the GAI.
[b] Totals may be different on account of rounding.
[c] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect wetlands.

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

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Lake/ Pond	Stream/ River	Total[b]
Clear Creek-Sacramento River	18020154	2	0.7	0.1	**0.8**
Cow Creek	18020151	1	0.0	<0.1	**<0.1**
Lower Klamath	18010209	5	0.0	0.9	**0.9**
Lower Pit	18020003	2	0.0	0.3	**0.3**
McCloud	18020004	1	0.0	0.5	**0.5**
Sacramento Headwaters	18020005	5	0.0	2.5	**2.5**
Scott	18010208	2	0.0	0.2	**0.2**
Shasta	18010207	3	0.0	0.2	**0.2**
Smith	18010101	2	0.0	<0.1	**<0.1**
South Fork Trinity	18010212	1	0.0	0.1	**0.1**
Trinity	18010211	11	0.0	2.1	**2.1**
Upper Klamath	18010206	3	0.0	2.4	**2.4**
Total[b,c]	Not applicable	**33**	**0.7**	**9.3**	**10.1**

[a] The SAMNA forecasts impacts for 12 of the 17 HUC-8s in the GAI.
[b] Totals may be different on account of rounding.
[c] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect non-wetland waters.

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

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Montane Riparian	Valley Foothill Riparian	Total[b, c]
Lower Klamath	18010209	3	0.7	0.0	**0.7**
Sacramento Headwaters	18020005	2	0.0	0.4	**0.4**
Salmon	18010210	1	0.2	0.0	**0.2**
Scott	18010208	1	<0.1	0.0	**<0.1**
Trinity	18010211	3	1.4	0.0	**1.4**
Upper Klamath	18010209	1	0.2	0.0	**0.2**
Total[c,d]	Not applicable	**8**	**2.5**	**0.4**	**2.9**

[a] The SAMNA forecasts impacts for 6 of the 17 HUCs in the GAI.
[b] The sum of montane riparian and valley foothill riparian habitat impacts is provided.
[c] Totals may be different on account of rounding.
[d] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect riparian habitat.

ES.6 Benefiting Transportation Project Considerations

One intent of the AMP's founding legislation is for Caltrans to realize the potential of advance mitigation to accelerate transportation project delivery. At this time (February of fiscal year 2022/23), Caltrans is almost 3 years into the SHOPP Ten-Year Book planning period. Hence, for the time period under consideration, fiscal years 2019/20 through 2028/29, Caltrans District 2 intends to prioritize purchasing or developing mitigation credits or values that are planned for the middle and end of the 10-year planning period.

Given the expected timing of mitigation need, at this time (February of fiscal year 2022/23) credits or values that can be purchased or established by 2023/2024 (within the next 2 years) within the GAI could address a subset of the impacts presented in Chapter 5. For example, mitigation credits purchased or established in 2 years could potentially address:

- 8.8 acres of Foothill yellow-legged frog habitat impacts, potentially contributing to the acceleration of 4 transportation projects
- 4.4 acres of fisher habitat impacts, potentially contributing to the acceleration of 3 transportation projects

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

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

ES.7 Conservation Goals and Objectives

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

Wildlife Resources Goals and Objectives

When establishing wildlife resources compensatory mitigation credits in accordance with SHC § 800.6(a), Caltrans will seek to align advance mitigation project scopes with the conservation goals and objectives of the multiple natural resource regulatory agencies with the authority to approve wildlife resource-related credit establishment and with the authority to approve their application to offset transportation project-related impacts. At a broad scale, Caltrans' understanding of the wildlife resources goals and objectives presented in this RAMNA encompasses protecting, preserving, and enhancing large-scale ecological processes, environmental gradients, biological diversity, and regional linkages. Informed by relevant plans, policies, and regulations, the goals and objectives

presented summarize how state and federal natural resource regulatory agencies, land managers, and other interested parties have prioritized regional conservation that preserves intact habitat and provides habitat linkages and connectivity. In recognition of transportation project acceleration needs, wildlife goals and objectives place an emphasis on species of mitigation need habitats in the GAI; however, advance mitigation for the benefit of species of mitigation need is anticipated to have broader benefits for multiple special-status species that rely on the same habitats. Caltrans' understanding of natural resource regulatory agency wildlife goals gathered for this RAMNA include:

- Conserving and expanding habitat for species of mitigation need
- Preserving, enhancing, and increasing connectivity between blocks of species of mitigation need habitat
- Supporting resiliency of the landscape to climate change
- Decreasing mortality and protecting population health of species of mitigation need
- Providing multi-species and multi-resource benefits

Objectives and sub-objectives are provided under each of the above goals in Chapter 7 to guide Caltrans advance mitigation project scoping toward those actions that would create the greatest functional lift for wildlife resources in the GAI. Sub-objectives capture more specific measures from conservation and land management plans that address threats to the aforementioned resources.

Aquatic Resources Goals and Objectives

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

- Providing for no net loss of area, functions, values, and conditions of wetland and non-wetland water resources
- Restoring and/or enhancing the chemical, physical, and biological integrity of wetlands and non-wetland waters
- Restoring or enhancing and expanding habitat for fish species of mitigation need
- Supporting resiliency of aquatic resources to climate change
- Providing multi-resource benefits

Sub-objectives are included for each goal in Chapter 8 to guide Caltrans project scoping toward those actions that would create the greatest functional lift for aquatic resources in the GAI. Sub-objectives also capture more specific measures from conservation and land management plans that address threats to the aforementioned resources.

ES.8 Authorized Activity Summary

A summary of Caltrans' need for compensatory mitigation credits in the GAI and the feasibility of each SHC § 800.6(a) authorized activity to address is provided in Chapter 9. As pointed out in Chapter 6, given the expected timing of mitigation need, at this time (February of fiscal year 2022/23) mitigation that can be purchased or established by 2023/24 (within the next 2 years) could potentially address the following:

- 8.8 acres of Foothill yellow-legged frog habitat impacts, potentially contributing to the acceleration of 4 transportation projects
- 4.4 acres of fisher habitat impacts, potentially contributing to the acceleration of 3 transportation projects

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

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 (February of fiscal year 2022/2023), 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 availably 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, the Federal Highway Administration, metropolitan planning organizations, regional transportation planning

agencies, other public agencies that implement transportation improvements, Native American tribes, interested parties, and the public; feasibility in consideration of mitigation need and timing; and other information presented here and that is publicly available to develop a high-level advance mitigation project scope to be included in an advance mitigation project's nomination materials. Once a nominated advance mitigation project is approved by the Caltrans Director, the Caltrans District will begin advance mitigation project delivery, which includes stakeholder engagement, project alternative analysis, coordination with natural resource regulatory agencies with the authority to approve compensatory mitigation, contracting with third parties and/or credit sponsors, and developing an agency-approved instrument and/or one or more advance mitigation project-specific interagency agreement.

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

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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 *Klamath Mountains Ecoregion Section Overlapping Caltrans District 2 Regional Advance Mitigation Needs Assessment* ("RAMNA"), the California Department of Transportation ("Caltrans") District 2:

- presents its forecast of natural resource compensatory mitigation[1] needs for the Klamath Mountains Ecoregion Section and
- assesses the feasibility of advance mitigation to address all or some of its compensatory mitigation needs for a 10-year planning horizon.

Sources used for this RAMNA are cited throughout this document, and links to geographic information system ("GIS") sources are provided in Appendix A, *GIS Sources*.

The RAMNA was developed with the goal of realizing the benefits of advance mitigation, which:

- anticipates that unavoidable impacts will be identified in the future and
- consists of having compensatory mitigation available that has already been vetted and agreed upon by natural resource regulatory agencies as representing mitigation actions before transportation projects are completely designed and funded.

When compensatory mitigation actions are independent of transportation project delivery timelines, there is an opportunity to (1) improve the schedule and cost predictability of complying with natural resource regulatory agency compensatory mitigation conditions on transportation projects and (2) consolidate the anticipated compensatory mitigation from multiple transportation projects into fewer and larger mitigation actions, establishing mitigation credits that provide a greater ecological value than implementing multiple small project-by-project actions. Credits are the usual currency of advance mitigation actions.

This document is intended to be both an internal communication tool between Caltrans' Functional Units[2] and an external communication tool for Caltrans to communicate with the Federal Highway Administration ("FHWA"), natural resource regulatory agencies, other transportation agencies (that is, metropolitan planning organizations ["MPOs"], regional transportation planning agencies ["RTPAs"], and other public agencies that

[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.

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.

1.1 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 State Highway Operation and Protection Program ("SHOPP") or State Transportation Improvement Program ("STIP") funded 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)

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

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

1.1.1. AMP Guidelines

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

Figure 1-1. Advance Mitigation Planning Phase

Source: Caltrans (2019a)

Figure 1-2. Advance Mitigation Project Delivery Phase

Source: Caltrans (2019a)

1.1.2. Advance Mitigation Planning Phase

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

Caltrans District 2 will first use the information and analysis presented in this RAMNA to inform Step 4 of the advance mitigation planning phase. Step 4 is the point in the advance mitigation planning process when Caltrans justifies, proposes, and scopes an advance mitigation project based on its needs (Caltrans 2019a). Advance mitigation project scopes informed by this RAMNA will provide enough information, at the appropriate level of detail,

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

for an advance mitigation project to be nominated to the Caltrans Director for funding approval. The advance mitigation planning phase will conclude when the Caltrans Director approves a specific nominated Caltrans District 2 advance mitigation project for funding (Step 5; Caltrans 2019a). Thereafter, Caltrans District 2 will use the RAMNA as a reference (Caltrans 2019a).

1.1.3. Advance Mitigation Project Delivery Phase

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

1.1.4. 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

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

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

- Regulatory agency approvals are discretionary and often conditional; well-executed advance mitigation does not necessarily increase the likelihood of obtaining agency approval for any particular transportation project.
- The 2008 Mitigation Rule expresses a preference for advance mitigation (in several forms) but also provides flexibility for off-site and out-of-kind mitigation where important aquatic resources in a watershed area have been identified as priority areas because of the importance of such resources, widespread loss of such resources, and/or the likelihood of successful execution of mitigation at priority sites.
- Advance mitigation projects should optimize their conservation benefit in such a way that the number and types of mitigation credits (or similar) are maximized.
- Advance mitigation projects, like transportation projects and conservation projects, have financial, technical, and strategic risks and require a scope, schedule, and budget.
- Advance mitigation projects to establish credits should allow for longer timelines for plant establishment, which is crucial to success.
- Transportation projects must include mitigation costs in the scoping and programming of their budgets because they are required by law to reimburse the AMA for use of mitigation produced by the AMP [SHC § 800.6(b)].
- The AMA is a revolving account. With a revolving account, reimbursed funds are reinvested into new advance mitigation projects.

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

1.2 Caltrans District 2 Transportation Infrastructure[5]

Headquartered in Redding, Caltrans District 2 is responsible for maintaining and operating 1,750 centerline miles in Lassen, Modoc, Plumas, Shasta, Siskiyou, Tehama, and Trinity Counties and in portions of Buttte and Sierra Counties. The SHS roadways range from scenic two-lane highways to controlled-access freeways. US 395 and Interstate 5 are two major north-to-south routes connecting northern and southern California. State Routes 299 and 36 are two major east-to-west routes connecting US 1 in the west with US 395 in the east.

Other transportation agencies that implement transportation improvements within Caltrans District 2's boundaries (MPOs, RTPAs, and other public agencies) are the Lassen County Transportation Commission, Modoc County Transportation Commission, Plumas County Transportation Commission, Shasta Regional Transportation Agency, Siskiyou County Local Transportation Agency, Tehama County Transportation

[5] Adapted from: https://dot.ca.gov/caltrans-near-me/district-2/d2-popular-links/d2-about

Commission, and Trinity County Transportation Commission. The aforementioned transportation agencies are eligible for STIP funding.

Figure 1-3 shows the road infrastructure in the geographic area of interest ("GAI") for this RAMNA.

1.3 Potentially Benefitting Transportation Projects

As pointed out in Section 1.1, only SHOPP- and STIP-funded transportation projects are authorized to benefit from mitigation credits or values purchased or established with AMA funds [SHC § 800(b)].

- The SHOPP funds repair and preservation, emergency repairs, safety improvements, and some highway operational improvements on the SHS. Caltrans implements the SHOPP. SHOPP transportation projects do not typically increase capacity.
- The STIP, along with other programs, funds state highway improvements, intercity rail, and regional highway and transit improvements. Local and regional transportation agencies typically implement the STIP. Some STIP transportation projects may increase capacity.

More details regarding Caltrans District 2 SHOPP transportation projects—and the hydrologic unit code eight-digit ("HUC-8"), ecoregion section, advertised year, and planned activities for each planned transportation project—are provided in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*, of this RAMNA. No STIP transportation projects were identified for the GAI and planning period.

1.4 Regulatory Framework Summary

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

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

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

Figure 1-3. GAI Road Infrastructure

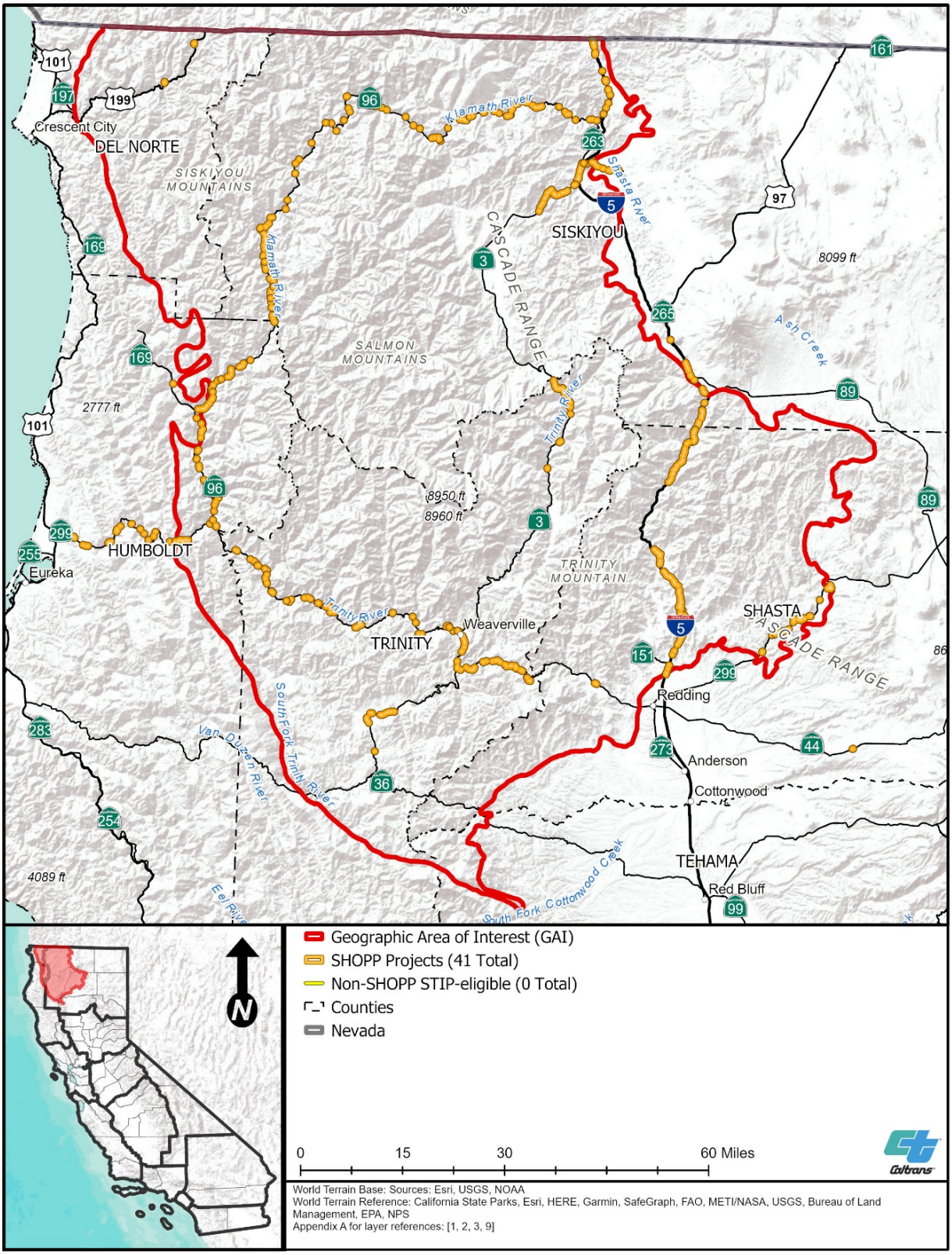


Table 1-2. Natural Resource Regulatory Agencies with Oversight over Natural Resources in the GAI

Partner	Web Address
CDFW, Northern Region	https://wildlife.ca.gov/Regions/1
California State Water Resources Control Board ("SWRCB")	https://www.waterboards.ca.gov/
California Regional Water Quality Control Board ("RWQCB"), Central Valley	https://www.waterboards.ca.gov/centralvalley/
California RWQCB, North Coast	https://www.waterboards.ca.gov/northcoast/
National Marine Fisheries Service ("NMFS") West Coast, California Coastal Office	https://www.westcoast.fisheries.noaa.gov/
U.S. Army Corps of Engineers, South Pacific Division ("Corps"), Sacramento District	https://www.spk.usace.army.mil/
Corps, San Francisco District[a]	https://www.spn.usace.army.mil/
U.S. Environmental Protection Agency ("EPA"), Region 9	http://www.epa.gov/region9/
U.S. Fish and Wildlife Service ("FWS"), Arcata Field Office	https://www.fws.gov/arcata/
FWS, Klamath Falls Field Office	https://www.fws.gov/klamathfallsfwo/
FWS, Sacramento Field Office	https://www.fws.gov/sacramento/
FWS, Yreka Field Office	https://www.fws.gov/yreka/

[a] Although a small portion of the GAI falls within the jurisdiction of the Corps' Portland District, the San Francisco Corps performs permitting for the area.

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

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

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

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

As discussed previously, credits are the usual currency of mitigation established through an advance mitigation project; however, other values may also be established. Establishing conservation banks, mitigation banks,[6] and in-lieu fee programs requires an instrument. Existing policies and regulations prescribe what an instrument must contain and address, as well as the terms of use for the credits generated by the mitigation bank, conservation bank, or in-lieu fee program. Similarly, establishing HCPs and NCCPs requires an agreement.

1.5 SAMNA

Predicting likely future transportation project effects on natural resources takes place at the intersection of transportation planning and conservation planning. In 2020, consistent with Step 1 of the advance mitigation planning process (Figure 1-1), the AMP forecast Caltrans' statewide compensatory mitigation needs for the transportation improvements conceptualized in the *State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2021/22—2030/31* ("SHOPP Ten-Year Book") for fiscal years 2022 to 2031 (Caltrans 2021a). The forecast was performed using the Caltrans Statewide Advance Mitigation Needs Assessment Reporting Tool ("SAMNA Reporting Tool"), a GIS overlay model developed by Caltrans to support advance mitigation planning (Caltrans 2021b). Potential impacts for all 12 Caltrans Districts were estimated. Statewide, almost 1,000 transportation projects and over 600 wildlife and aquatic resources were evaluated through the SAMNA Reporting Tool, yielding thousands of results (Caltrans 2021a). The SAMNA results for all of Caltrans District 2 are provided in Appendix B of Caltrans 2021a.

For consistency and as appropriate, tables, figures, and information presented throughout this document, including in Chapter 2, *Environmental Setting*, are consistent with the geospatial data within the SAMNA Reporting Tool. SAMNA Reporting Tool geospatial data and model assumptions are described more fully in Caltrans 2021a. Results are presented in four different reports: terrestrial and aquatic species and subspecies, special-status fish, waters, and wetlands. The unit of measure for impacts is acres.

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

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 2021a). The SAMNA results:

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

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

1.6 GAI and Resource Focus

Given the quantity of resources evaluated through the SAMNA, limited AMA funding, and the need for the AMP to revolve the account, Caltrans focused this analysis on a geographic area with wildlife habitats and aquatic resources where planned transportation project schedules would likely benefit from (1) having compensatory mitigation credit purchase transactions complete and/or (2) compensatory mitigation credit supplies increased.

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

1.6.1. GAI

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

- Reviewed the entirety of Caltrans District 2's SAMNA results by HUC-8 sub-basin and ecoregion (Caltrans 2021a; www.dot.ca.gov/programs/environmental-analysis/biology/advancemitigation);
- Reviewed the SAMNA results' associated future transportation project locations and activities anticipated for the SHOPP (Caltrans 2021a);

- Reviewed non-SHOPP STIP-eligible transportation improvement plans for the next 10 years;
- Observed that the portions of Caltrans District 2 located within the Klamath Mountains Ecoregion Section have forecast compensatory mitigation needs during the planning period; and
- Identified the Klamath Mountains Ecoregion Section as a location where Caltrans District 2 and other public agencies that implement transportation improvements could benefit from advance mitigation planning—hereafter called the "GAI" (Figure 1-3).

As pointed out in Section 1.5, the RAMNA is designed to be consistent with SAMNA Reporting Tool geospatial data and model assumptions. One of those decisions is the areal presentation of modeled results. In consultation with the natural resource regulatory agencies, it was determined that presenting SAMNA results by HUC-8 and ecoregion section, and not political boundaries, would steer advance mitigation planning toward better ecological outcomes: the 2008 Mitigation Rule specifies the HUC-8 as the basis of service areas for mitigation banks, and CDFW's State Wildlife Action Plan ("SWAP") is organized by ecoregion. Because the Klamath Mountains Ecoregion forms an ecological boundary and not a political boundary, some portions of the GAI overlap Caltrans District 1. In addition to Caltrans District 2, Caltrans District 1 may choose to take the lead on an advance mitigation project that would address its needs within the GAI.

1.6.2. Species of Mitigation Need

Compensatory mitigation for species in the GAI was identified as both a historical and anticipated future transportation project compensatory mitigation need within District 2. 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. Hence, to further focus the planning effort, Caltrans District 2 identified species that, if compensatory mitigation credits were available, transportation projects could potentially benefit. The determination was made after reviewing SAMNA results for the planning period. These "species of mitigation need" are foothill yellow-legged frog (*Rana boylii*), Shasta and Samwel salamanders (*Hydromantes shastae* and *H. samweli*),[7] and fisher (*Pekania pennanti*), all terrestrial wildlife species. Within the GAI, foothill yellow-legged frog is a state species of special concern. Shasta and Samwel salamander are state listed as threatened. Fisher is a state species of special concern. Because fish species impact forecasts were minimal, and few transportation projects

[7] The Shasta salamander complex includes populations of Shasta salamander, Samwel salamander, and Wintu salamander (*Hydromantes wintu*), all of which occur in the GAI; however, only Shasta and Samwel salamander would be affected by proposed transportation projects in the GAI in the planning period.

would benefit if mitigation credits were available, no fish species of mitigation need were identified.

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

1.6.3. Aquatic Resources

For the purposes of this document, aquatic resources include all wetlands and non-wetland waters that may be subject to Corps, EPA, RWQCB, and/or CDFW regulations, as well as special-status fish[8] that may be subject to CDFW, FWS, and/or NMFS regulations.

Compensatory mitigation needs for aquatic resources and riparian habitat in the GAI were identified as both historical transportation project compensatory mitigation needs and anticipated future transportation project compensatory mitigation needs within Caltrans District 2. SHOPP transportation projects have historically been conditioned by natural resource regulatory agencies for these resources and have benefited from mitigation credits, when available.

Wetland, non-wetland water, and riparian habitat compensatory mitigation needs are anticipated for 11 of the 17 HUC-8 sub-basins that overlap the Klamath Mountains Ecoregion Section in the GAI:

- Clear Creek-Sacramento River (18020154)
- Cow Creek (18020151)
- Lower Klamath (18010209)
- Lower Pit (18020003)
- McCloud (18020004)
- Sacramento Headwaters (18020005)
- Scott (18010208)
- Shasta (18010207)
- South Fork Trinity (18010212)
- Trinity (18010211)
- Upper Klamath (18010206)

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

[8] See Section 1.6.2.

1.7 RAMNA

This RAMNA is a planning-level document that:

- Provides a desktop analysis of relevant available information pertaining to the Klamath Mountains Ecoregion Section, referred to as the GAI;
- Applies to fiscal years 2021/22 to 2030/31 (planning period), which is concurrent with the time period addressed by the SHOPP Ten-Year Book (Caltrans 2021a);
- Discusses potential compensatory mitigation conditions that may be placed on future transportation projects by the seven resource and regulatory agency signatories[9] to the *Master Process Agreement for Planning and Developing Advance Mitigation throughout California for the California Department of Transportation Advance Mitigation Program* (Caltrans et al. 2020);
- Focuses on wildlife habitats and aquatic resources that have a high probability of requiring transportation project-related compensatory mitigation in the GAI and planning period;
- Documents Caltrans' forecast of potential wildlife and aquatic resource[10] compensatory mitigation needs for the GAI and planning period, as reported by the SAMNA (Caltrans 2021a);
- 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).

[9] Natural resource regulatory signatories are CDFW; SWRCB; Corps Los Angeles, Sacramento, and San Francisco Districts; EPA; FWS; NMFS; and California Coastal Commission ("CCC").
[10] Aquatic resources are discussed in Section 1.6.3.

1.8 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.

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

The AMP guidelines state that Caltrans will contact MPOs, RTPAs, and other public agencies that implement transportation projects to request specific information about their potential STIP transportation projects, to help inform the potential demand for compensatory mitigation in that area (Section 7.2 of Caltrans 2019a). Caltrans District 2 Transportation Planning conducted outreach and contacted the partners listed in Table 1-3.

Table 1-3. Regional Transportation Interaction and Outreach Summary

Date	Description
January 14, 2022	Caltrans-regional partner advance mitigation coordination

1.8.2. 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 October 2022, 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 1-4 lists the commenters and the date of their communication. All comments received were considered, addressed, and incorporated into the document, as appropriate.

Table 1-4. Comments Received by Caltrans on the RAMNA

Commenter	Date of Comment Letter
CDFW[a]	December 6, 2022
SWRCB	December 2, 2022
Corps, Sacramento District	December 2, 2022
FWS	November 30, 2022
EPA	December 6, 2022
NMFS	Not provided

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

1.8.3. 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 1-5. The discussion has informed this document.

Table 1-5. Interagency Meetings

Meeting Participants	Meeting Date
CDFW; Corps, Sacramento District; EPA; FWS; NMFS; and EPA[a]	November 16, 2022
CDFW	January 4, 2023
FWS	December 15, 2022

[a] On account of a schedule conflict, the SWRCB and RWQCBs did not attend.

1.9 Document Organization

This document is organized as shown in Table 1-6.

Table 1-6. Document Organization

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

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

2. ENVIRONMENTAL SETTING

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

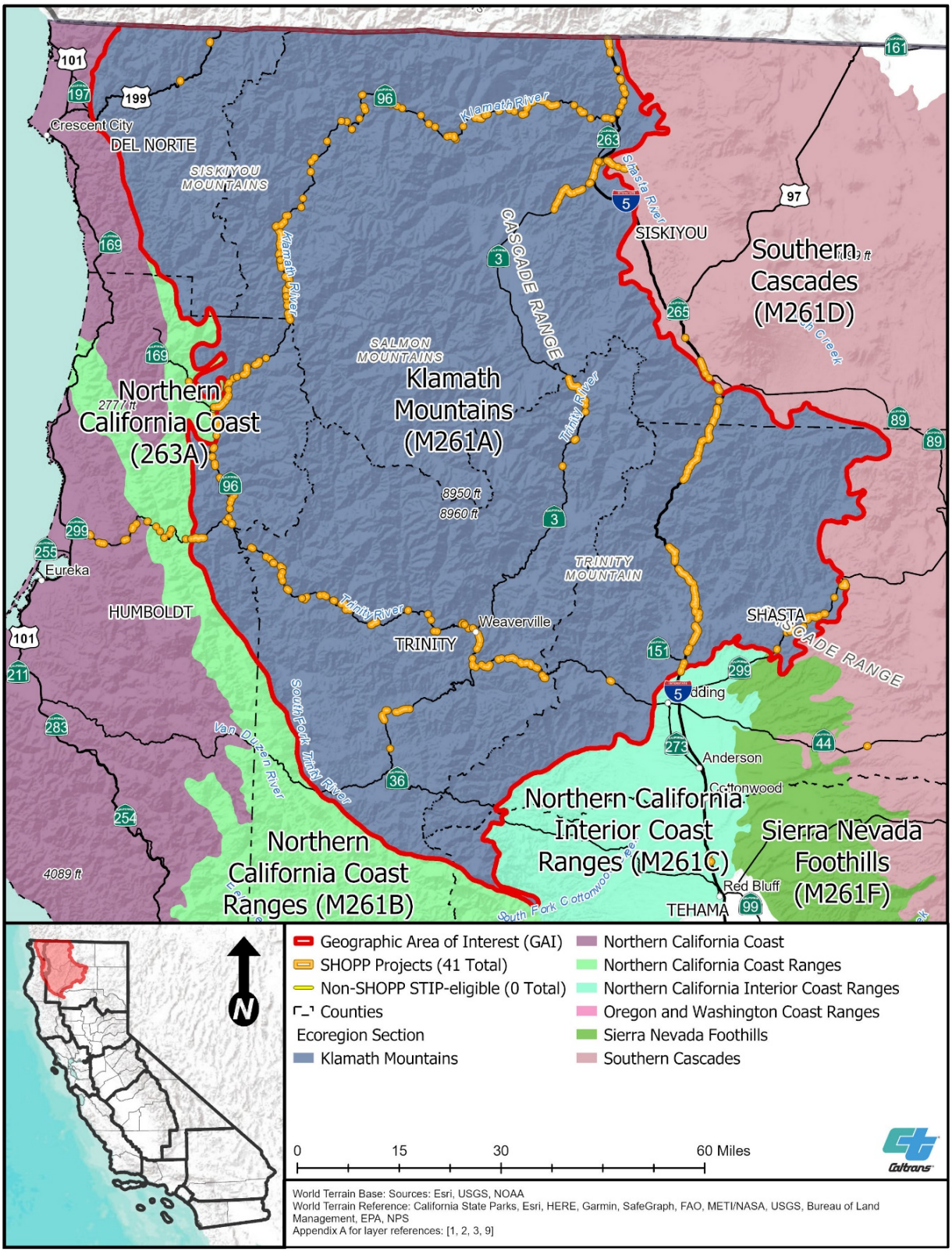
On each figure, Caltrans has provided the general location of planned SHOPP transportation projects that, during the 10-year planning period addressed by this document, natural resource regulatory agencies may condition with compensatory mitigation.[2] The GAI's road infrastructure is described in Chapter 1, *Introduction*, and additional 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 Section

The GAI consists of approximately 5.6 million acres in northern California within the Klamath Mountains Ecoregion Section, which is overlapped by portions of 17 sub-basins (see Section 2.11) (Figure 2-1). Ecoregion sections are defined as the largest ecological unit of the U.S. Department of Agriculture ("USDA") Forest Service ("USFS") National Hierarchical Framework of Ecological Units, which are nested within larger provinces (Cleland et al. 1997). The Klamath Mountains Ecoregion Section is within the larger Sierran Steppe – Mixed Forest – Coniferous Forest – Alpine Meadow Province (McNab et al. 2007).

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

Figure 2-1. Ecoregion Section in the GAI



2.2 Land Ownership in the GAI

The GAI spans parts of Del Norte, Humboldt, Shasta, Siskiyou, Tehama, and Trinity Counties (Figure 2-2). Federal lands, which account for most of the land in the GAI (71 percent), are administered and managed by the USDA's USFS, the U.S. Department of Interior's Bureau of Land Management ("BLM") and National Park Service ("NPS"), and the U.S. Bureau of Reclamation (Table 2-1, Figure 2-2). National Park land includes Lassen Volcanic National Park and Whiskeytown-Shasta-Trinity National Recreational Area. USFS land includes the Klamath, Rogue River, Shasta-Trinity, Siskiyou, and Six Rivers National Forests. Privately owned and managed land accounts for 27 percent of the GAI. State lands, which account for 0.2 percent of land in the GAI, include lands owned and managed by the California State Lands Commission, California Department of Parks and Recreation, CDFW, California Department of Forestry and Fire Protection, and other public lands. Only 0.1 percent of land in the GAI is governed by counties, cities, and special districts. Other lands in the GAI, which account for 1.9 percent of the GAI, are owned or managed by Native American tribes and nonprofit conservancies and land trusts (Table 2-1, Figure 2-2).

2.2.1. Protected Lands

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

In the California Protected Areas Database, lands are assigned U.S. Geological Survey ("USGS") Gap Analysis Program ("GAP") status ranks that define the degree of protection for biodiversity conservation using a 1 to 4 coding system. Areas with a GAP status of 1 are managed for biodiversity; areas with a GAP status of 2 are managed for biodiversity with disturbance events suppressed; areas with a GAP status of 3 are managed for multiple uses, potentially including mining or off-road vehicle use; and areas with a GAP status of 4 have no known mandate for biodiversity protection. The method of applying these California Protected Areas Database ranks is done in collaboration with the USGS' Protected Areas Database of the U.S.

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

Table 2-1. Land Ownership in the GAI

Land Owner or Land Use	Number of Parcels	Total Acreage per Agency/Owner[a]	Ownership as Percentage of GAI
USFS	5,031	3,762,204	67.5
Private (urban and other)	1	634,977	11.4
Private (agriculture)	1	446,214	8.0
Private (unassigned)	1	404,177	7.2
BLM	334	165,802	3.0
Tribal lands	8	70,485	1.3
NPS	3	42,943	0.8
Nonprofit conservancy and land trust	23	32,139	0.6
California State Lands Commission	27	5,816	0.1
U.S. Bureau of Reclamation	13	4,762	0.1
California Department of Parks and Recreation	5	4,237	0.1
City, county, and special district	49	3,040	0.1
CDFW	17	708	<0.1
California Department of Forestry and Fire Protection	1	158	<0.1
Other state agency	1	41	<0.1
Total	**N/A**	**5,577,701**	**100%**

Sources: U.S. Bureau of Indian Affairs, California Protected Lands Database, California Conservation Easement Database, Caltrans 2021c, U.S. Census Bureau, USDA, and California Department of Technology for land parcels
Note: N/A = not applicable
[a] Numbers were rounded to the nearest whole number.

Figure 2-2. Land Ownership

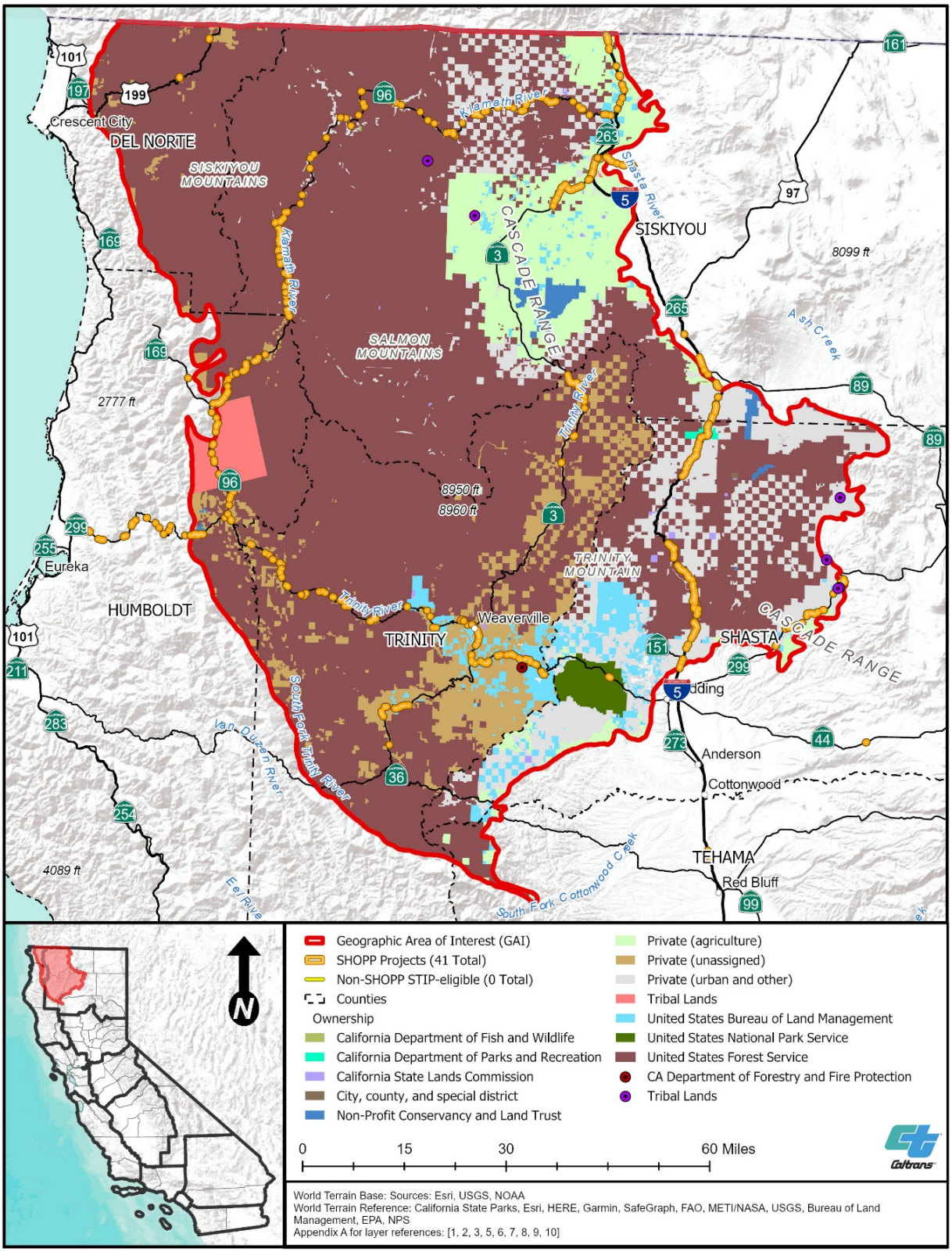
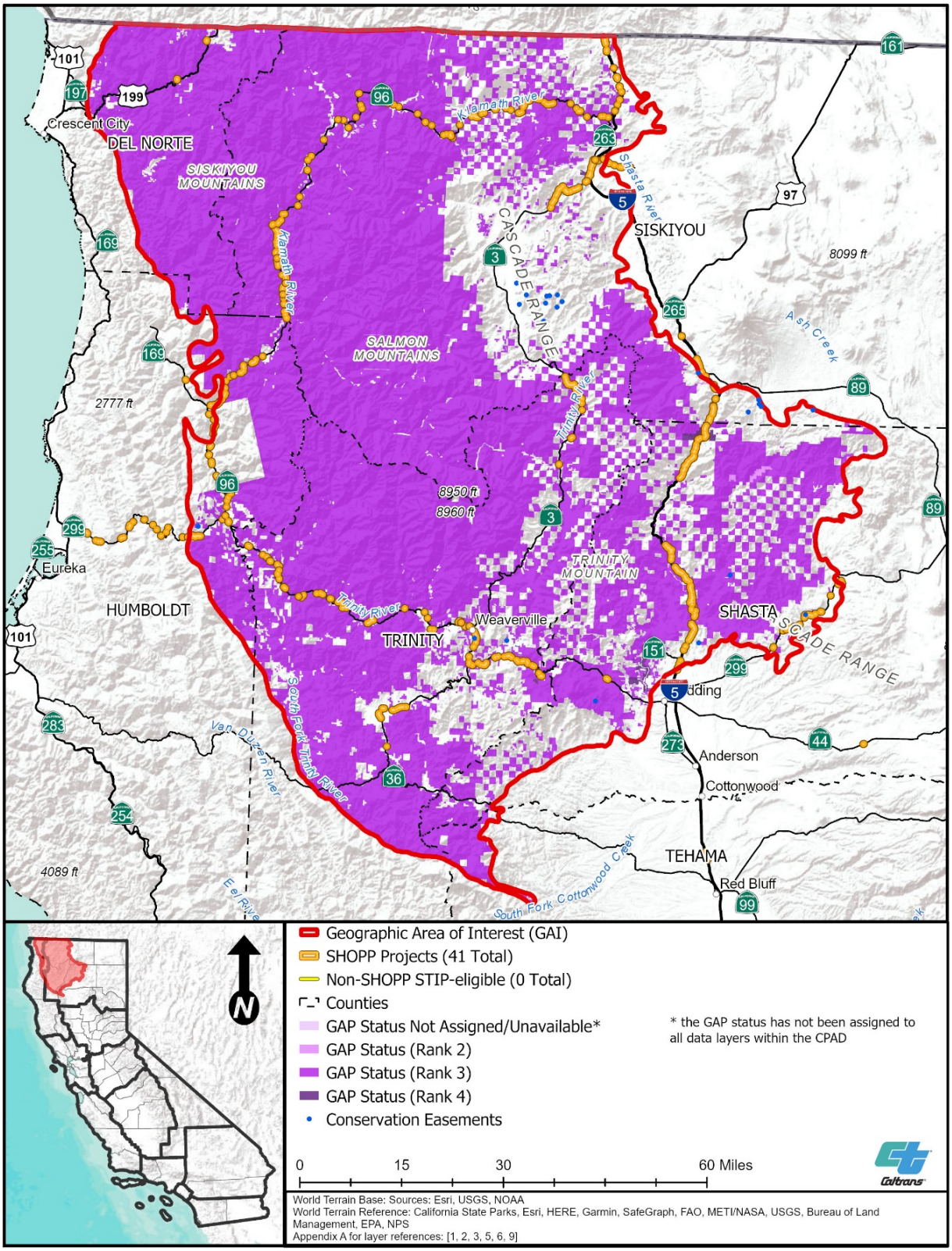


Figure 2-3. Protected Lands



2.3 Topography

The GAI is located in northern California and includes parts of the Klamath Mountains, northern Coastal Ranges, and Cascade Ranges. The GAI includes steep, rugged peaks and is bound by the Coastal Ranges to the west and south, the Sacramento Valley to the south, and the Modoc Plateau to the east. Elevations in the GAI range from 87 to 9,024 feet above mean sea level (Figure 2-4).

2.4 Climate

The GAI is characterized by a Mediterranean climate with wet, cool winters and dry, warm summers. Average temperatures range from 45 to 55 degrees Fahrenheit. Average annual precipitation ranges from 14 to 125 inches, with most precipitation falling between October and April and generally declining with distance from the coast (Caltrans 2018b; North Coast RWQCB 2018; Skinner et al. 2006).

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

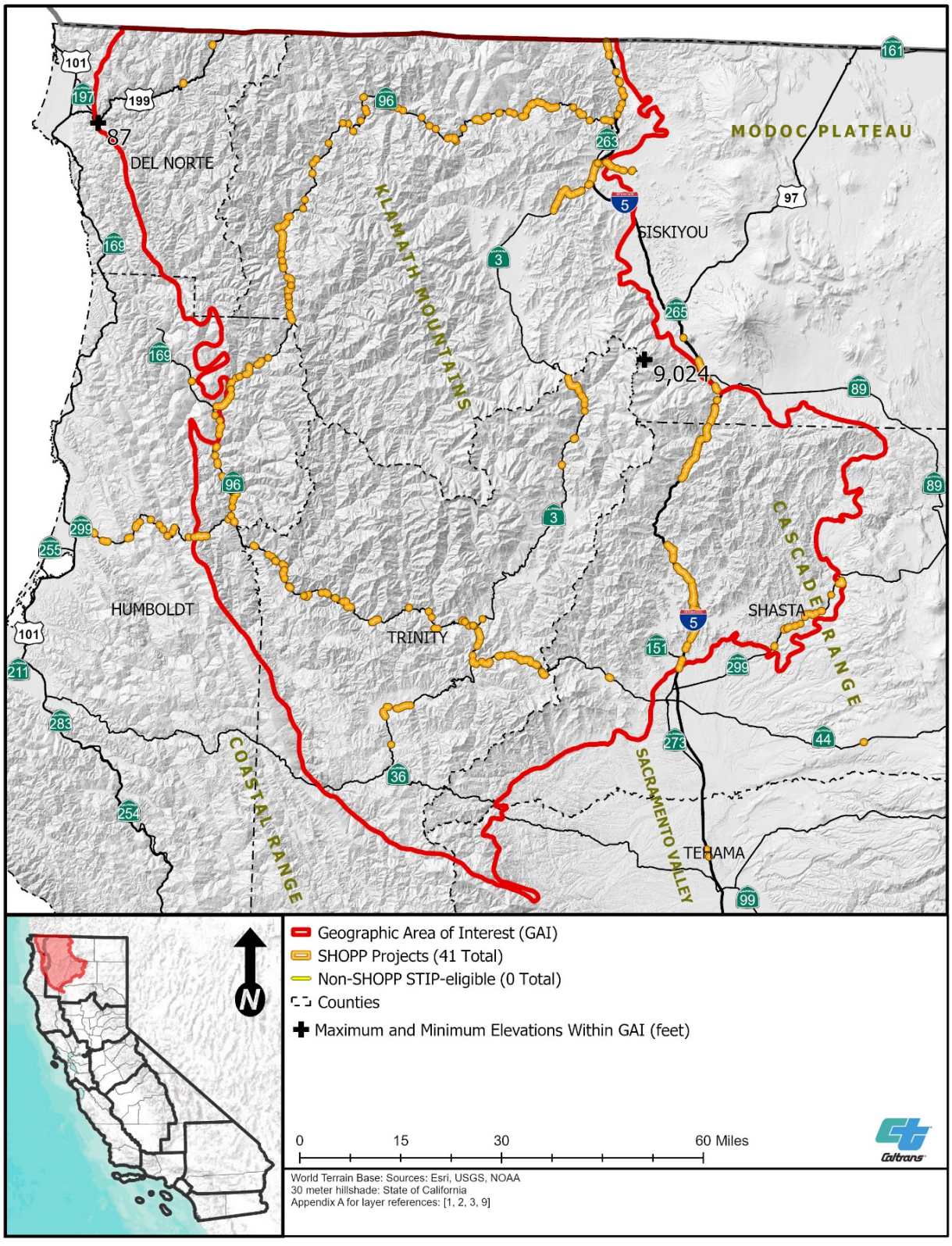
2.4.1. Climate Vulnerability Assessment

From 2017 through 2019, Caltrans performed a statewide climate change vulnerability assessment for the SHS. The analysis provided in the *Caltrans Climate Change Vulnerability Assessments: District 2 Technical Report* (Caltrans 2018b) is based on global climate change data compiled by the Intergovernmental Panel on Climate Change.

Caltrans applies three future emissions scenarios for greenhouse gas emission concentrations in the technical report—representative concentration pathway 2.6, which assumes global annual greenhouse gas emissions will peak in the next few years and then begin to decline substantially; representative concentration pathway 4.5, which assumes emissions will peak around 2040 and then begin to decline; and representative concentration pathway 8.5, which assumes that high emission trends continue to the end of the century—for three future 30-year periods centered on the years 2025 (2010 to 2039), 2055 (2040 to 2069), and 2085 (2070 to 2099).

The effects of climate change in the GAI pose risks for transportation infrastructure, reliability, and capacity. Transportation systems were designed for historical climate conditions; changing climatic conditions, including an increased frequency of extreme weather events, are expected to disrupt and damage the SHS. Predicted climate change effects consist of projected increases in the average and maximum temperatures, including more frequent extreme heat events; more volatile precipitation, with increases in heavy precipitation, with dry years becoming drier and wet years becoming wetter; and an increased risk of drought, wildfires, flash flooding, and landslides over the three time periods analyzed in the technical report (Caltrans 2018b).

Figure 2-4. Topography



2.4.2. Climate Resiliency

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

Resiliency is an important consideration when establishing compensatory mitigation. The terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a) is presented on Figure 2-5. Areas with low resilience include the Siskiyou Mountains in the far northwestern part of the GAI and two areas of the Cascade Range in the northeastern and southeastern parts of the GAI. Most of the GAI includes areas with moderate to high resilience.

2.5 Land Cover Types

General land cover types are depicted on the maps provided in Appendix C, *Land Cover Types*. Land cover types in the GAI were extracted from the SAMNA, which developed its vegetation data layer by merging CDFW's California Wildlife Habitat Relationships ("CWHR") Vegetation Classification and Mapping Program GIS database, the USFS Classification and Assessment with LandSat of Visible Ecological Groupings, and the California Department of Forestry and Fire Protection vegetation layer (Caltrans 2021c). Based on these data, tree-dominated habitats account for the largest habitat type, encompassing 82.9 percent of the GAI, with Sierran mixed conifer the most common (Table 2-2, Appendix C). Shrub-dominated habitats account for 10.7 percent of the GAI, with montane chaparral the most common. Herbaceous-dominated habitats account for 3.3 percent of the GAI, with annual grassland the most common. Developed and non-vegetated habitat types (barren areas) combined account for 1.9 percent of the GAI, with barren the most common. Aquatic habitats account for 1.2 percent of the GAI, with lacustrine the most common. Land cover is generally shown on Figure 2-6.

Figure 2-5. Terrestrial Climate Resilience Rankings

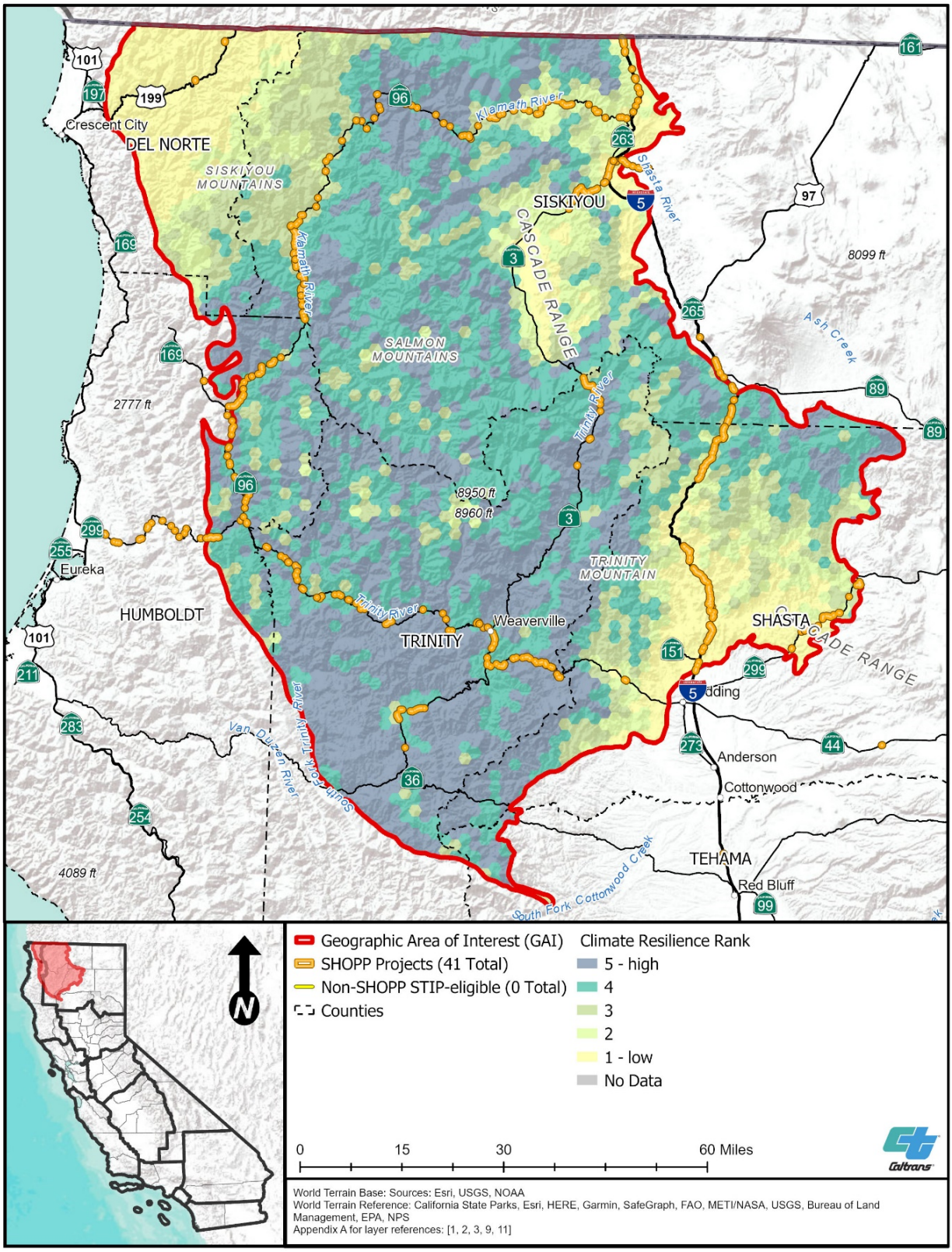


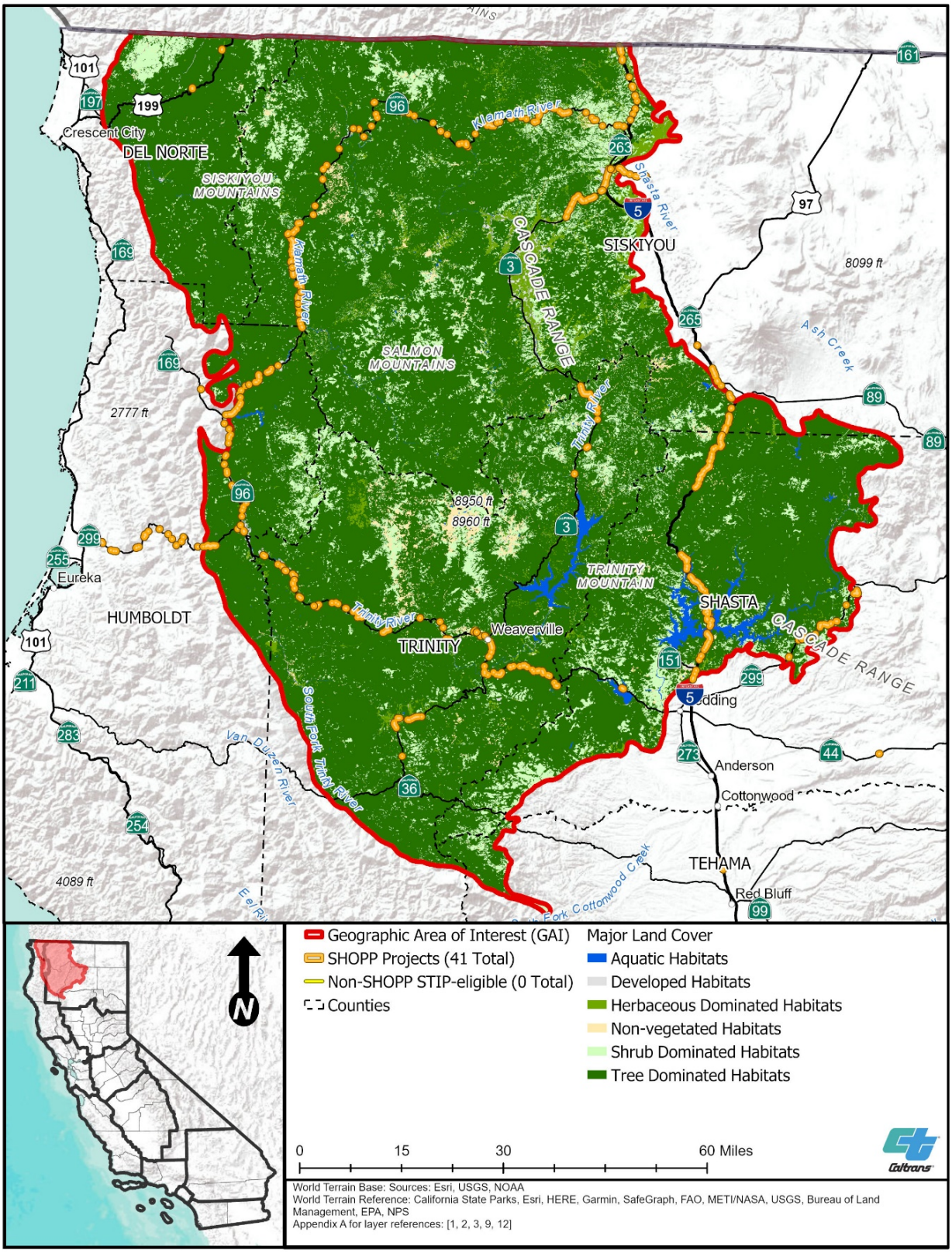
Table 2-2. Land Cover Types in the GAI

CWHR Habitat Type	Acres[a]	Cover as Percentage of GAI[b]
Tree-dominated Habitats	**4,627,340**	**82.89**
Aspen	61	<0.01
Blue Oak-Foothill Pine	47,098	0.84
Blue Oak-Foothill Pine; Blue Oak Woodland	5	<0.01
Blue Oak Woodland	19,145	0.34
Closed-Cone Pine-Cypress	23,764	0.43
Coastal Oak Woodland	853	0.02
Douglas-Fir	1,139,178	20.41
Eastside Pine	6,167	0.11
Jeffrey Pine	35,591	0.64
Juniper	17,718	0.32
Klamath Mixed Conifer	142,002	2.54
Lodgepole Pine	403	0.01
Montane Hardwood	449,386	8.05
Montane Hardwood-Conifer	616,506	11.04
Montane Riparian	18,124	0.32
Ponderosa Pine	116,139	2.08
Red Fir	149,774	2.68
Redwood	1,120	0.02
Sierran Mixed Conifer	1,500,749	26.88
Subalpine Conifer	73,776	1.32
Valley Foothill Riparian	500	0.01
Valley Oak Woodland	118	<0.01
White Fir	269,163	4.82
Shrub-dominated Habitats	**597,076**	**10.69**
Alpine Dwarf-Shrub	148	<0.01
Bitterbrush	660	0.01
Chamise-Redshank Chaparral	15,873	0.28
Coastal Scrub	142	<0.01
Low Sage	192	<0.01

CWHR Habitat Type	Acres[a]	Cover as Percentage of GAI[b]
Mixed Chaparral	237,612	4.26
Montane Chaparral	337,693	6.05
Sagebrush	4,756	0.09
Herbaceous-dominated Habitats	**185,465**	**3.32**
Annual Grassland	120,954	2.17
Fresh Emergent Wetland	4	<0.01
Pasture	39,790	0.71
Perennial Grassland	20,770	0.37
Wet Meadow	3,947	0.07
Aquatic Habitats	**64,613**	**1.16**
Lacustrine	56,336	1.01
Riverine	8,277	0.15
Developed Habitats	**26,275**	**0.47**
Cropland	11,957	0.21
Deciduous Orchard	34	<0.01
Evergreen Orchard	6	<0.01
Irrigated Grain Crops	1	<0.01
Urban	14,247	0.26
Vineyard	30	<0.01
Non-vegetated Habitats	**82,036**	**1.47**
Barren	82,036	1.47
Total	**5,582,805**	**100%**

Source: Caltrans 2021c
[a] Numbers were rounded to the nearest whole number.
[b] Numbers were rounded to the hundredths.

Figure 2-6. Major Land Cover[a]



[a] For greater detail, see Appendix C.

2.6 Invasive Species

Both invasive plant and animal species are known to occur in the GAI. Invasive species include plants and animals that are not native to an area, typically have high growth and reproductive rates, and are able to outcompete native plants and animals, often because of a lack of natural predators or controls (FWS 2012; National Wildlife Federation n.d.). Invasive species may affect native species, including special-status species, by directly competing for resources, preying on native species, introducing or spreading diseases, reducing the complexity and biodiversity of ecosystems, altering soil chemistry and water availability, and increasing wildfire potential (FWS 2012).

Three organizations maintain invasive species databases for California. The Invasive Species Council of California maintains a list of invasive plant and animal species throughout the state of California (California Invasive Species Advisory Committee 2010). The California Department of Food and Agriculture also maintains a list of noxious weeds for California (USDA Natural Resources Conservation Service 2003). The California Invasive Plant Council ("Cal-IPC") maintains a California invasive plant inventory that categorizes nonnative plant species based on the severity of their potential ecological impacts (Cal-IPC 2022).

Nonnative invasive plant pathogens occur in the GAI. The pathogen that causes sudden oak death (*Phytophthora ramorum*), a water mold, is particularly problematic in north coast redwood forests and has killed millions of oaks (*Quercus* spp.) and tanoaks (*Lithocarpus densiflorus*) along the California coast (California Oak Mortality Task Force 2019; CDFW 2015a). This pathogen infests a range of shrub and tree host species, causing branch and shoot dieback and leaf spots. It spreads aerially by wind and can survive in infested plant material, litter, soil, and water (Goheen et al. 2006).

In the GAI, invasive plant species have been specifically identified as threats or stressors to terrestrial and aquatic biological resources. 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 SWAP or the Cal-IPC inventory include, but are not limited to, tree-of-heaven (*Ailanthus altissima*), giant reed (*Arundo donax*), slender wild oat (*Avena barbata*), black mustard (*Brassica nigra*), ripgut brome (*Bromus diandrus*), red brome (*Bromus rubens*), cheatgrass (*Bromus tectorum*), yellow starthistle (*Centaurea solstitialis*), spotted knapweed (*Centaurea stoebe* ssp. *micranthos*), Canada thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), poison hemlock (*Conium maculatum*), hedgehog dogtailgrass (*Cynosurus echinatus*), Scotch broom (*Cytisus scoparius*), water hyacinth (*Eichhornia crassipes*), medusahead (*Elymus caput-medusae*), leafy spurge (*Euphorbia virgata*), rattail sixweeks grass (*Festuca myuros*), Italian ryegrass (*Festuca perennis*), French broom (*Genista monspessulana*), shortpod mustard (*Hirschfeldia incana*), common velvet grass (*Holcus lanatus*), rough cat's-ear (*Hypochaeris radicata*), hydrilla (*Hydrilla verticillata*), dyer's woad (*Isatis tinctoria*), perennial pepperweed (*Lepidium latifolium*), curlyleaf pondweed (*Potamogeton crispus*),

Himalayan blackberry (*Rubus armeniacus*), red sorrel (*Rumex acetosella*), and Spanish broom (*Spartium junceum*) (Cal-IPC 2022; CDFW 2015a).

Nonnative animals that are/may be present in the GAI and that can negatively affect aquatic species include New Zealand mudsnails (*Potamopyrgus antipodarum*), quagga mussels (*Dreissena bugensis*), zebra mussels (*Dreissena polymorpha*), Asian clams (*Corbicula fluminea*), Chinese mystery snails (*Cipangoludina chinensis malleata*), nutria (*Myocastor coypus*), smallmouth bass (*Micropterus dolomieu*), brown trout (*Salmo trutta*), brook trout (*Salvelinus fontinalis*), Sacramento pikeminnow (*Ptychocheilus grandis*), yellow perch (*Perca flavescens*), American bullfrog (*Rana catesbiana*), and red swamp crayfish (*Procambarus clarkia*) (CDFW 2015a; NPS 2017a). Introduced nonnative animals such as bullfrogs, crayfish, and fish can negatively affect foothill yellow-legged frogs (*Rana boylii*) and other aquatic species through competition for food resources, acting as disease vectors, and predation (Hayes et al. 2016).

Nonnative animals that are/may be present in the GAI and that can negatively affect terrestrial wildlife through competition, predation, or parasitism include barred owls (*Strix varia*), feral pigs (*Sus scrofa*), European starlings (*Sturnus vulgaris*), wild turkeys (*Meleagris gallopavo*), and brownheaded cowbirds (*Molothrus ater*) (CDFW 2015a). Invasive animal species that are/may be associated with urban areas include common ravens (*Corvus corax*), domestic dogs (*Canis lupus familiaris*), domestic cats (*Felis catus*), Argentine ants (*Linepithema humile*), and fire ants (*Solenopsis invicta*) (CDFW 2015a; NPS 2017a). Common raven is native to California, but is considered a subsidized predator, benefiting from urbanization and human-altered habitats to increase its range.

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 2.16.2.

Special-status species with the potential to occur in the GAI that are anticipated to be affected were extracted from the SAMNA Reporting Tool's species-attributed vegetation data layer, which was developed using the CWHR (CDFW 2019a), the Jepson Herbarium's floristic province layer, CDFW's RareFind 5 database (CDFW 2019b), and other information (Caltrans 2018a; Appendix D). Special-status terrestrial 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, 66 non-fish special-status species have the potential to occur in the GAI, including 10 plants, 2 invertebrates, 10 amphibians, 1 reptile, 26 birds, and 17 mammals.

Although it is the best information currently available, the SAMNA Reporting Tool's species list is uncertain (Appendix D). The species-attributed list developed for the SAMNA Reporting Tool depends on a species having a defined geographic range within the CWHR or having occurrences documented in the California Natural Diversity Database (Caltrans 2021b). When CWHR home range and/or CNDDB 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 the SAMNA data layers and results are suitable to assist with advance mitigation project scoping, establishing compensatory mitigation credits approved by one or more natural resource regulatory agencies requires additional analysis and site-specific studies.

2.8 Critical Habitat

FWS and NMFS regulate impacts on critical habitat under the ESA. The ESA (16 USC § 1531–1544) defines critical habitat for a threatened or endangered species as (i) "specific areas within the geographical area occupied by the species at the time it is listed … on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protection;" and (ii) "specific areas outside the geographical area occupied by the species at the time it is listed … upon a determination by the Secretary that such areas are essential for the conservation of the species."

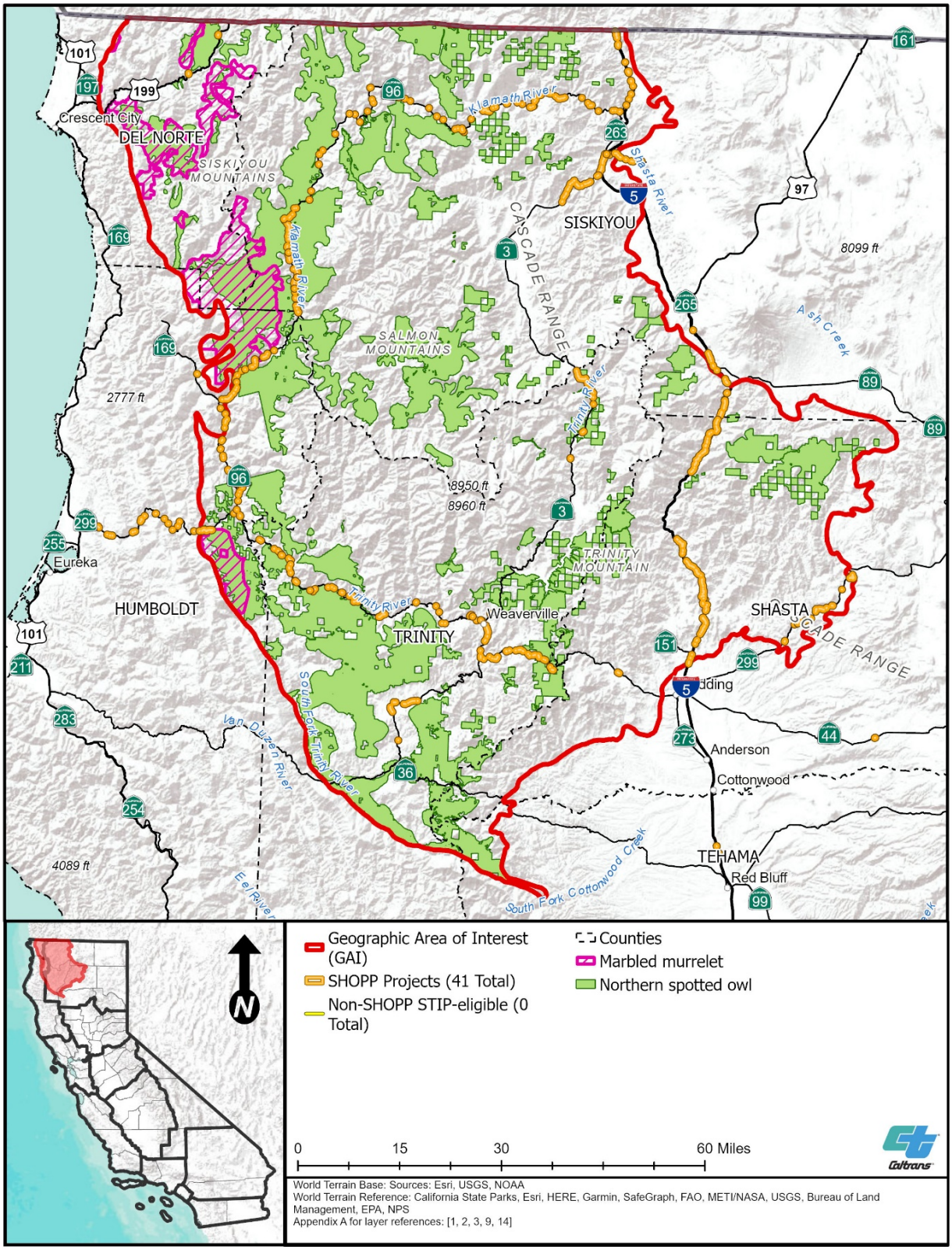
Further, the ESA clarifies that critical habitat "shall not include the entire geographical area which can be occupied by the threatened or endangered species." Critical habitat designations reflect a rigorous process. Before publishing the rule finalizing the critical habitat designation, FWS publishes proposals to designate critical habitat in the *Federal Register* and considers information received during the public comment period (FWS 2017).

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

- Marbled murrelet (*Brachyramphus marmoratus*)
- Northern spotted owl (*Strix occidentalis caurina*)

Critical habitat is an important consideration when establishing compensatory mitigation. Designated critical habitat for these species is indicated on Figure 2-7.

Figure 2-7. Federally Designated Critical Habitat



2.9 Essential Fish Habitat

NMFS is responsible for ensuring impacts on EFH are addressed. EFH was defined by Congress in 1996 in an amendment to the Magnuson-Stevens Fishery Conservation and Management Act. EFH covers federally managed fish and invertebrate species that are not found strictly in fresh water and includes all aquatic habitat types where fish spawn, breed, feed, or grow to maturity (NMFS 2017a). Habitat types include coral reefs, kelp forests, bays, wetlands, rivers that connect to the ocean, and deep ocean habitat. EFH is protected by imposing fishing limitations and requiring consultation with NMFS prior to any federal work with the potential to affect fish habitat. NMFS designates EFH for sharks, tuna, and other migratory species that cross regional boundaries. Habitat for other managed fish species is determined by regional fishery management councils (NMFS 2017a). The GAI includes EFH for chinook salmon (*Oncorhynchus tshawytscha*) and coho salmon (*Oncorhynchus kisutch*) (Figure 2-8).

2.10 Connectivity

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

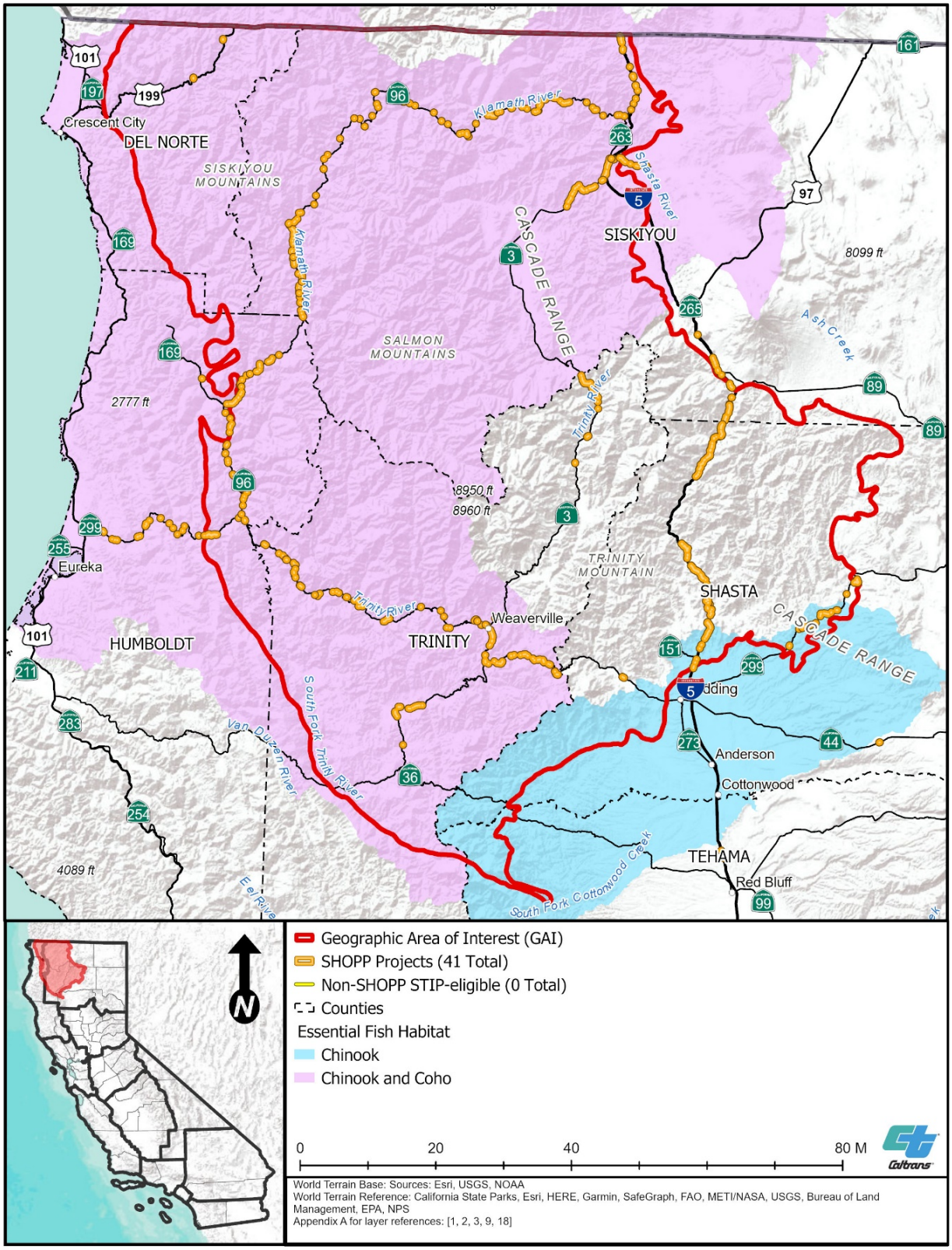
2.10.1. Wildlife Movement

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

California Essential Habitat Connectivity

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

Figure 2-8. Essential Fish Habitat



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 2-9). 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 3 or 4, followed by areas with a connectivity rank of 1 or 2, and fewer planned transportation projects occurring in areas with a connectivity rank of 5 (Figure 2-9).

Fisher Habitat Connectivity

The *Habitat Connectivity for Fishers and Martens in the Klamath Basin Region of California and Oregon* report identifies important landscape connectivity areas for fisher, Pacific marten, and other species, and where connectivity could be improved through restoration or other actions (Spencer et al. 2019). Habitat suitability models were used to define core habitat areas and delineate and prioritize linkages between these core areas. Core habitat areas for Pacific fisher are located throughout the GAI, with several least-cost corridors located primarily in the central and northwestern parts of the GAI (Figure 2-10). Although widespread, the core habitat areas are subject to edge effects and changes due to fires, forest management, and climate change (Spencer et al. 2019).

CDFW's California Wildlife Barriers 2020 Report

CDFW's *California Wildlife Barriers* 2020 report identified priority wildlife movement barriers created by linear infrastructure across the state to help focus financial resources on improving wildlife movement (CDFW 2020). 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.

Figure 2-9. Terrestrial Connectivity

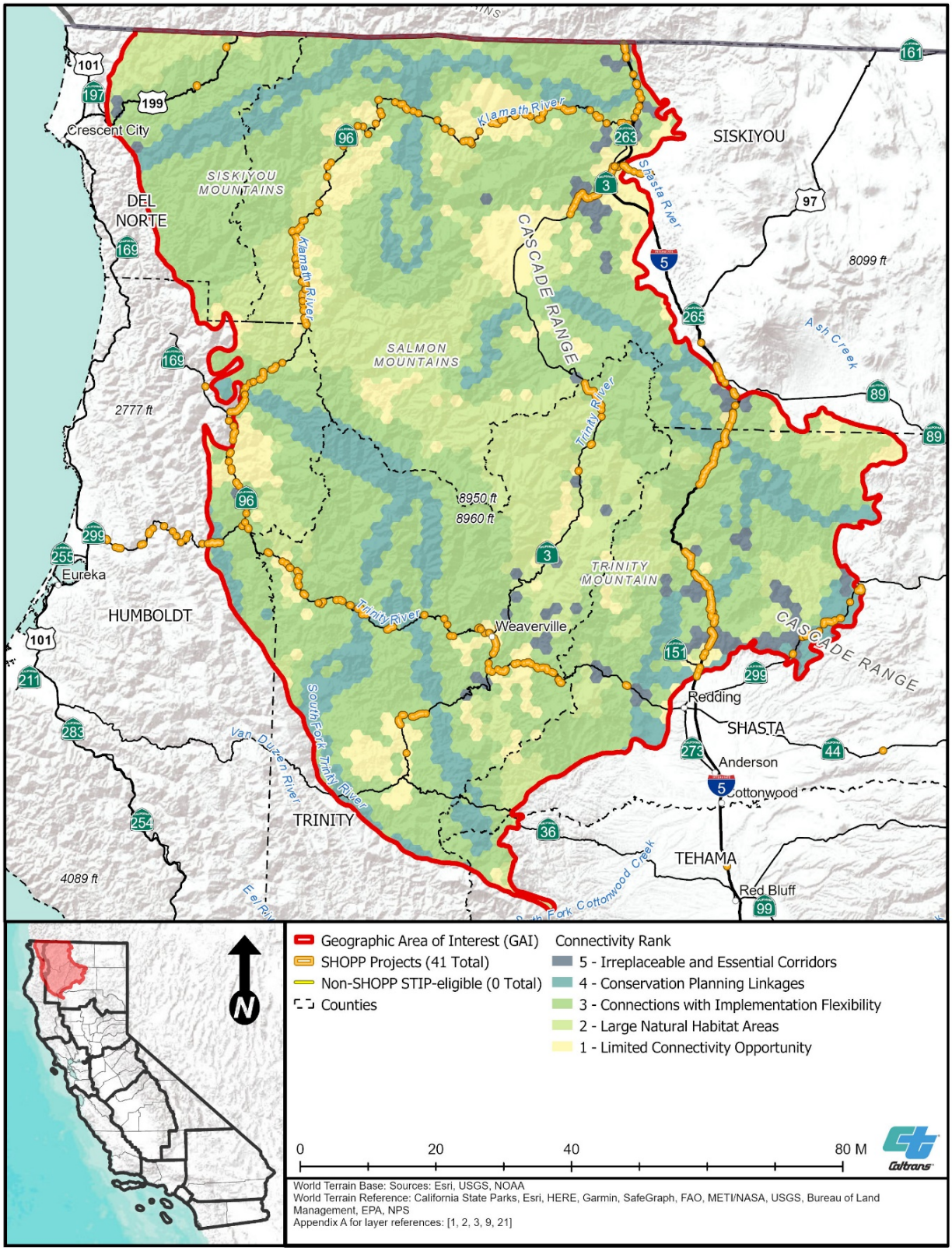
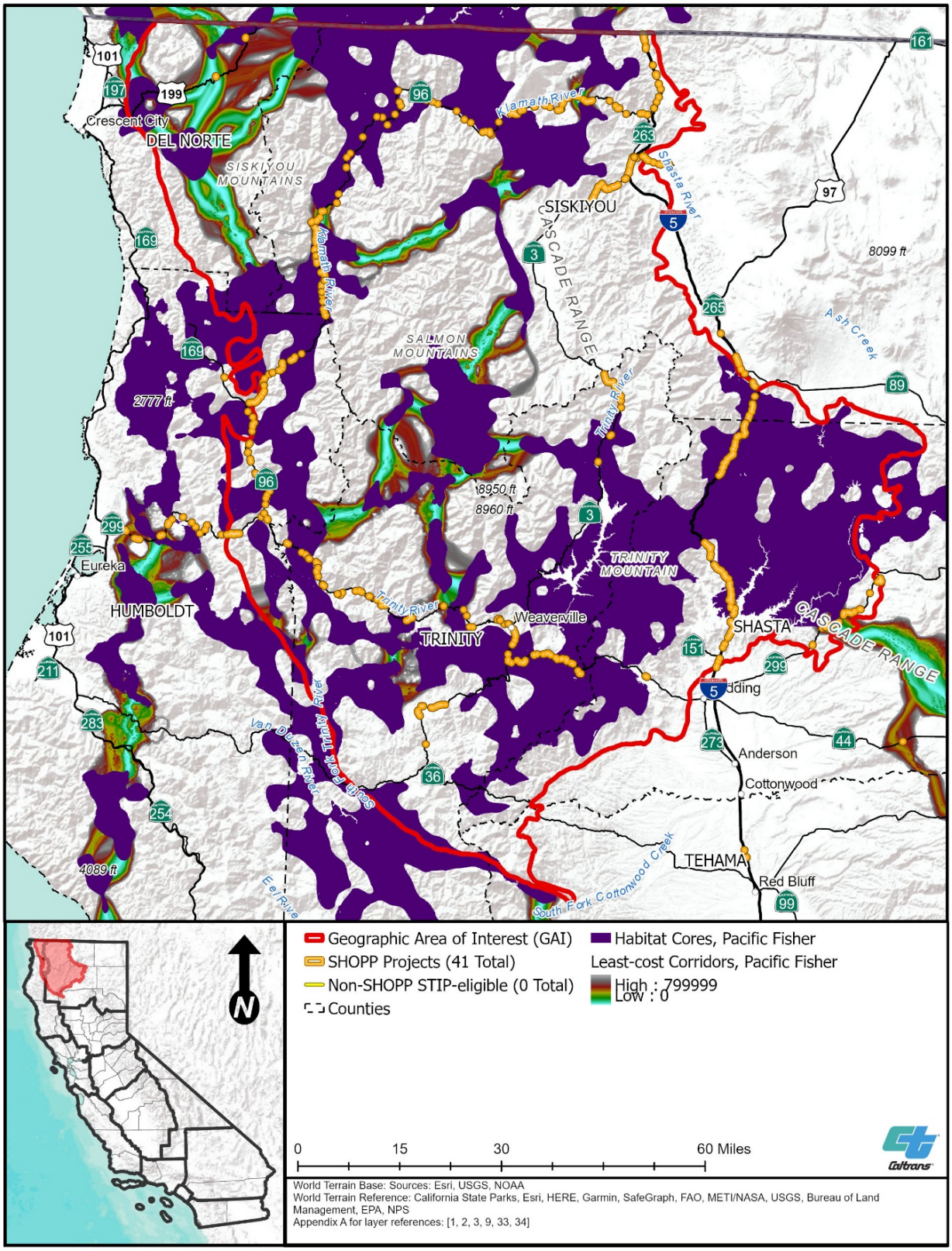


Figure 2-10. Fisher Habitat Connectivity



Two priority wildlife movement barriers were identified in the GAI. These barriers and the target species for movement are (1) Interstate 5 from Yreka to the Oregon border (mule deer, mountain lion, and gray wolf) and (2) the Interstate 5/299 intersection north to the Interstate 5/89 intersection (mule deer) (CDFW 2020).

2.10.2. Fish Passage

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

SHC § 156.1 requires Caltrans to:

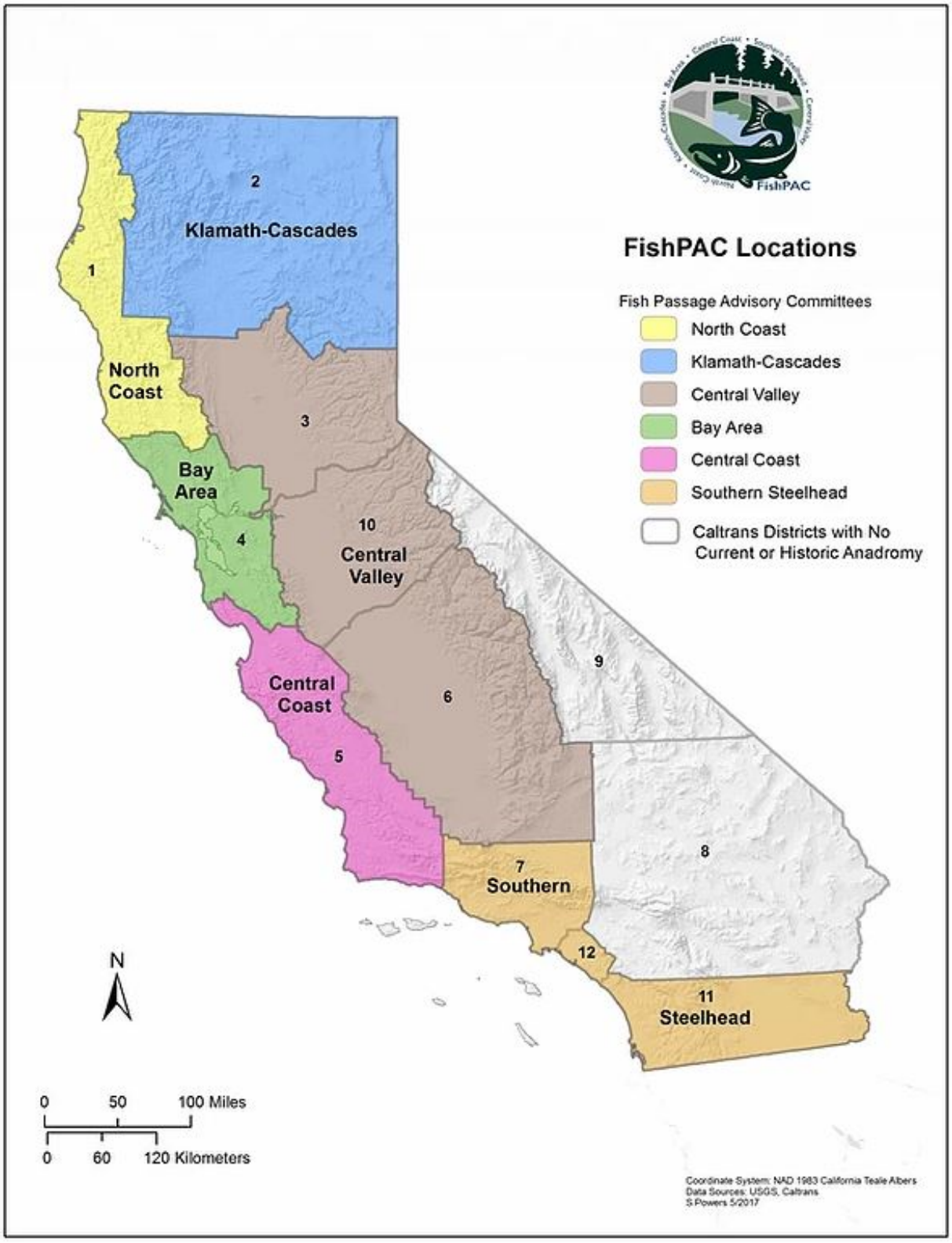
1. Provide an annual list of fish passage priorities for the SHS to the legislature. Fish Passage Annual Reports are available on the Caltrans Legislative Affairs website, and the most recent report is available from: https://dot.ca.gov/programs/legislative-affairs/reports.
2. Complete assessments of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

The CESA and ESA list 10 evolutionarily significant units ("ESUs")/distinct population segments ("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 2-11 depicts the six California Fish Passage Advisory Committee ("FishPAC") locations throughout the state. The FishPAC is a partnership between Caltrans, CalTrout, CCC, CDFW, FWS, NMFS, Pacific States Marine Fisheries Commission, and other local fish passage advocates. The FishPACs share science and data related to known fish barriers and prioritize SHS locations based on high-value habitat recovery.

Figure 2-11. California Fish Passage Advisory Committee Locations



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

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

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

The FishPAC helps Caltrans advance the desired outcomes of SHC § 156 (J. Walth, Caltrans, personal communication, 2020). In the 14 years since 2006, in collaboration with FishPAC, statewide, Caltrans has partially or fully remediated 51 barriers on the SHS and identified 556 additional barriers to salmon and steelhead. Results of Caltrans' and FishPACs' efforts to locate, assess, prioritize, and remediate fish passage barriers on the SHS are documented in Fish Passage Annual Reports prepared by Caltrans and submitted to the legislature as required by SHC § 156.1.

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

2.11 Sub-basins

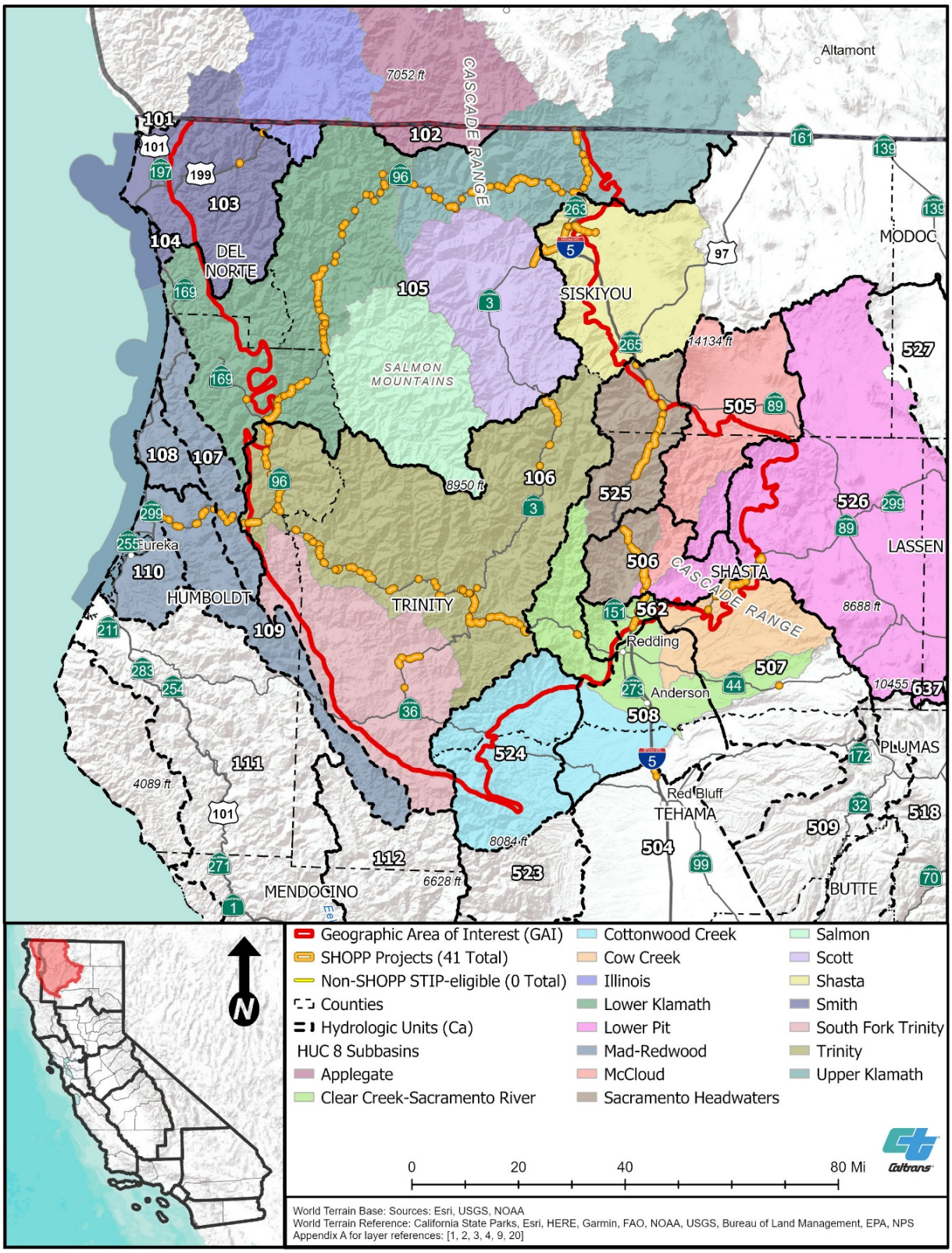
The Watershed Boundary Dataset maps the areal extent of surface water drainage in the U.S. It consists of a hierarchical system of nesting hydrologic units ("HUs") of various scales, each with an assigned HUC that is georeferenced to USGS topographic maps (USGS 2014). Each HUC classification consists of 2 to 12 digits. For example, 6-digit HUCs, or "HUC-6s," map to the basin level; 8-digit HUCs, or "HUC-8s," map to the sub-basin level; and 12-digit HUCs, or "HUC-12s," map to the sub-watershed level.

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

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

Appendix E, *Hydrologic Units*, provides a crosswalk between the HUC-8 and HU classification systems for each HUC-8 in the GAI. The GAI overlaps 17 sub-basins that loosely correspond to 13 HUs (Appendix E). Figure 2-12 shows the overlap between sub-basins and state-level HUs in the GAI.

Figure 2-12. HUC-8 Sub-basins and HUs



2.12 Hydrology

The 17 sub-basins of the GAI drain an area of 5,576,978 acres (8,714 square miles) (Table 2-3, Figure 2-12). Described individually in Appendix E, *Hydrologic Units*, these sub-basins include 7,764 rivers and streams that traverse 9,543 miles in the North Coast and Central Valley RWQCB boundaries (Table 2-3). Sub-basin acreages shown in Table 2-3 may include areas outside of the GAI.

Table 2-3. Sub-basins in the GAI

Sub-basin Name	Sub-basin Code (HUC-8)	Drainage Area (acres)[a]	Rivers and Streams (count)	Total Reach Length (miles)[a]
Applegate	17100309	58,247	63	91
Clear Creek-Sacramento River	18020154	219,785	249	378
Cottonwood Creek	18020152	164,711	225	276
Cow Creek	18020151	33,352	42	59
Illinois	17100311	37,552	53	70
Lower Klamath	18010209	723,875	1,040	1,260
Lower Pit	18020003	214,395	314	330
Mad-Redwood	18010102	281	1	0
McCloud	18020004	181,936	251	291
Sacramento Headwaters	18020005	339,355	344	463
Salmon	18010210	480,830	744	868
Scott	18010208	521,067	637	850
Shasta	18010207	149,036	160	199
Smith	18010101	331,922	511	650
South Fork Trinity	18010212	479,099	832	951
Trinity	18010211	1,287,109	1,775	2,199
Upper Klamath	18010206	354,428	523	609
Total	Not applicable	**5,576,978**	**7,764**	**9,543**

Source: California Department of Water Resources
[a] Numbers were rounded to the nearest whole number.

2.13 Flood Hazard Areas

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

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

Flood hazard areas in the GAI are shown on Figure 2-13. Waterbodies associated with the majority of flood hazard risk in the GAI include Shasta Lake, Keswick Reservoir, Whiskeytown Lake, and the Klamath and Trinity Rivers. 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.

2.14 Water Quality

Water quality objectives for surface waters and groundwater in the GAI are provided in the *Water Quality Control Plan for the North Coast Region* (North Coast RWQCB 2018) and 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* (Central Valley RWQCB 2019) ("Basin Plans"). Water quality objectives identified in the Basin Plans can be numerical or narrative. For example, the "chemical constituents" water quality objective for the protection of aquatic life and human health consists of federal water quality criteria for toxic "priority pollutants" under the California Toxics Rule (40 CFR § 131.38) and National Toxics Rule (40 CFR § 131.36). In contrast, the water quality objective for taste and odor is narrative. Undesirable tastes and odors in water are an aesthetic nuisance and can indicate the presence of other pollutants.

Surface water and groundwater beneficial uses are also identified in the Basin Plans (Central Valley RWQCB 2019; North Coast 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 retrofit that improve permeability or flows. Hence, this RAMNA considers beneficial uses identified for waterbodies located in the GAI relevant to the RAMNA when they support the preservation and enhancement of wildlife habitat and aquatic resources and are consistent with the AMP's objective to protect natural resources through transportation project mitigation (Table 2-4).

Figure 2-13. Flood Hazard Areas

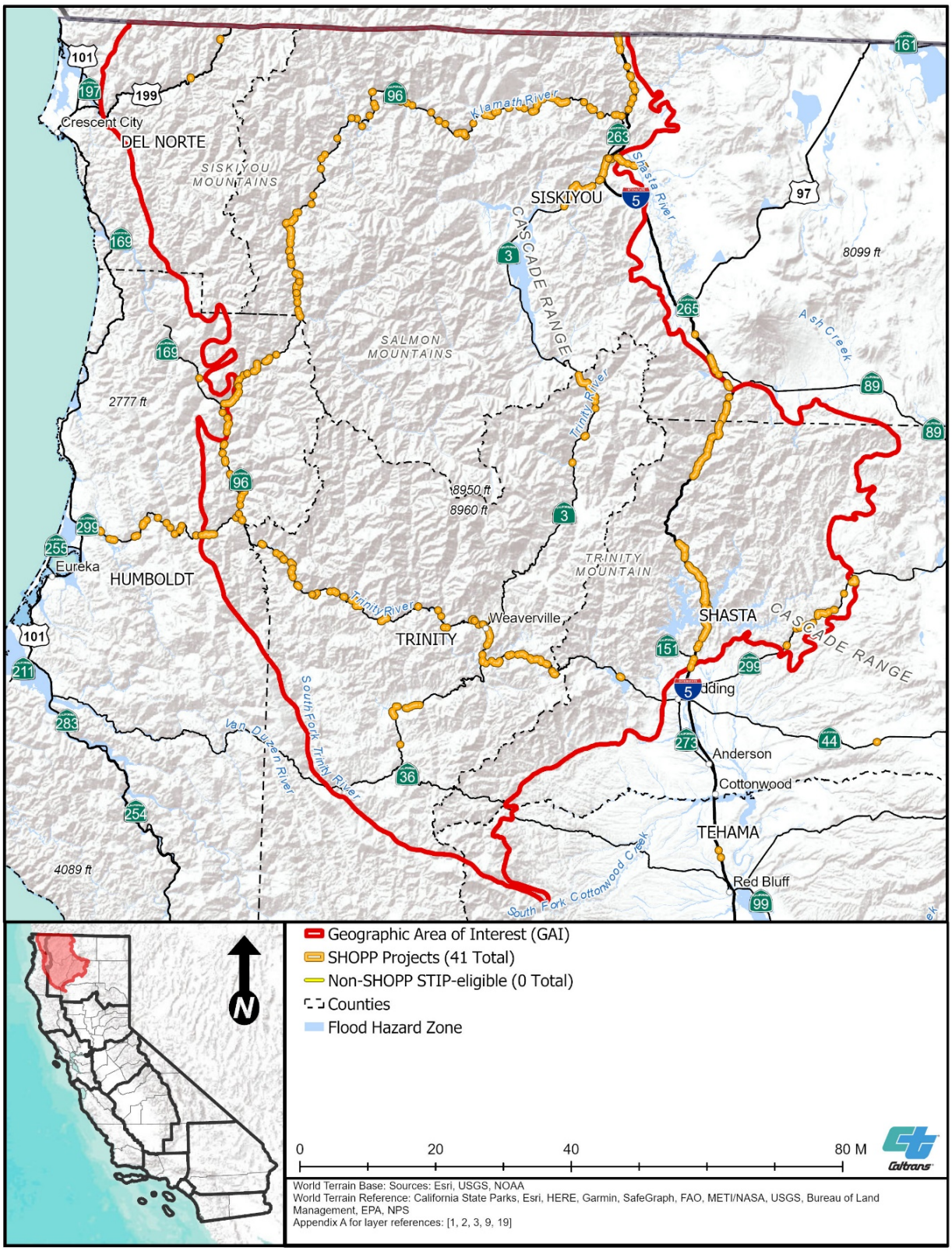


Table 2-4. Beneficial Uses in the GAI

Beneficial Use	Central Valley Basin Plan	North Coast Basin Plan	Relevant to RAMNA?[a]
Agricultural supply	Applicable	Applicable	No
Aquaculture	Not applicable	Applicable	No
Cold freshwater habitat	Applicable	Applicable	Yes
Commercial and sport fishing	Not applicable	Applicable	Yes
Freshwater replenishment	Not applicable	Applicable	Yes
Groundwater recharge	Not applicable	Applicable	Yes
Hydropower generation	Applicable	Applicable	No
Industrial process supply	Applicable	Applicable	No
Industrial service supply	Applicable	Applicable	No
Migration of aquatic organisms	Not applicable	Applicable	Yes
Municipal and domestic supply	Applicable	Applicable	No
Native American culture	Not applicable	Applicable	No
Navigation	Applicable	Applicable	No
Non-contact water recreation	Applicable	Applicable	No
Rare, threatened, or endangered species	Not applicable	Applicable	Yes
Spawning, reproduction, and/or early development	Applicable	Applicable	Yes
Warm freshwater habitat	Applicable	Applicable	Yes
Water contact recreation	Applicable	Applicable	No
Wildlife habitat	Applicable	Applicable	Yes

Source: Central Valley RWQCB 2019; North Coast 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.

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.

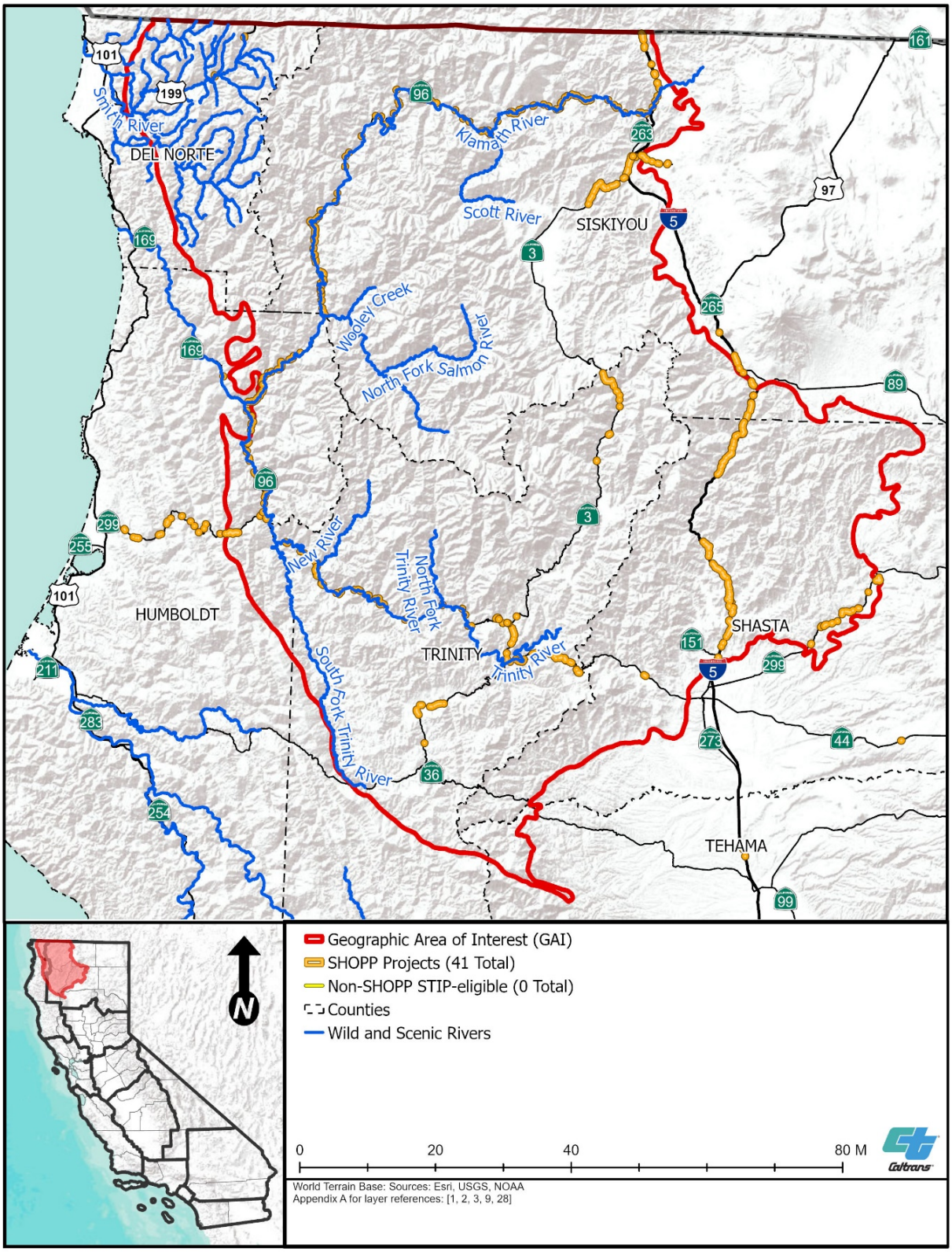
The CWA Section 303(d) list of impaired waters includes 14 waterbodies in the GAI (SWRCB 2021). This RAMNA considers a waterbody's CWA Section 303(d) impairment designation as relevant to the RAMNA when it is indicative of a waterbody's loss of a relevant aquatic resource-related beneficial use (Table 2-4). The primary sources of these impairments are rural and agricultural land uses, mining, silvicultural activities, sewage system and septic tank system discharges, and urban runoff. 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.

2.15 Wild and Scenic Rivers

The purpose of the federal Wild and Scenic Rivers Act of 1968 (16 USC Chapter 28) and the state Wild and Scenic Rivers Act of 1972 (Public Resources Code § 5093.50) is to protect and enhance the wild, scenic, and recreational values of designated rivers (National Wild and Scenic Rivers System 2016; Water Education Foundation 2022a). Rivers designated under the Wild and Scenic Rivers Act are classified as wild, scenic, or recreational. Wild river areas include rivers or sections of rivers that are free of impoundments, inaccessible except by trail, and have unpolluted waters. Scenic river areas include rivers or sections of rivers that are free of impoundments, have relatively undeveloped shorelines, and are accessible in some places by roads. Recreational river areas include rivers or sections of rivers that are readily accessible by road or railroad, have some development along shorelines, and may have impoundments or diversions.

The Klamath, Smith, and Trinity Rivers and their tributaries are nationally and state designated wild and scenic rivers in the GAI (National Wild and Scenic Rivers System 2016; Omnibus Public Land Management Act of 2009). The locations of these nationally and/or state designated wild and scenic rivers are provided on Figure 2-14. On January 1, 1981, Congress designated the Klamath River from the mouth to 3,600 feet below Iron Gate Dam and sections of its principal tributaries, the Salmon and Scott Rivers and Wooley Creek, with 11.7 miles as wild, 23.5 miles as scenic, and 250.8 miles as recreational. On January 19, 1981, and November 16, 1990, Congress designated the Smith River and its tributaries, with 78 miles as wild, 31 miles as scenic, and 216.4 miles as recreational. On January 19, 1981, Congress designated the Trinity River and its tributaries, including the North and South Forks and the New River, with 44 miles as wild, 39 miles as scenic, and 120 miles as recreational (National Wild and Scenic Rivers System 2016). The Klamath, Smith, and Trinity Rivers and their tributaries were included in the state wild and scenic river system in 1972 when the state Act was passed (California Wilderness Coalition 2022a, 2022b, 2022c). The McCloud River became a state designated wild and scenic river in 1989 but is not a nationally designated wild and scenic river (California Wilderness Coalition 2022d; National Wild and Scenic Rivers System 2016).

Figure 2-14. Wild and Scenic Rivers in the GAI



2.16 Aquatic Resources

A high-level view of major aquatic resources in the GAI is provided on Figure 2-15, 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 CCC, Corps, EPA, RWQCB, and/or CDFW regulations, as well as special-status fish managed by CDFW, FWS, or NMFS. Riparian habitat is discussed separately in Section 2.17.

The CCC regulates impacts on coastal wetlands and marine and aquatic resources, and these resources receive special protections under Coastal Act § 30230 et seq. Corps and EPA jurisdiction under Section 404 of the CWA includes any activity that may cause a discharge of dredged or fill material into waters of the U.S. ("WOTUS"), including wetlands. Corps jurisdiction also includes any work or structure affecting navigable WOTUS, pursuant to Section 10 of the Rivers and Harbors Act and 33 CFR § 329, respectively. RWQCB jurisdiction includes any activity that may cause a discharge of waste to waters of the state, including WOTUS, rivers, streams, and lakes, including ephemeral, intermittent, and perennial watercourses and wetlands, seeps, and springs. CDFW regulates any activity that may divert or obstruct the natural flow of a river, stream, or lake; change the bed, channel, or bank of any river, stream, or lake; use material from any river, stream, or lake;[4] and deposit or dispose of material into any river, stream, or lake.

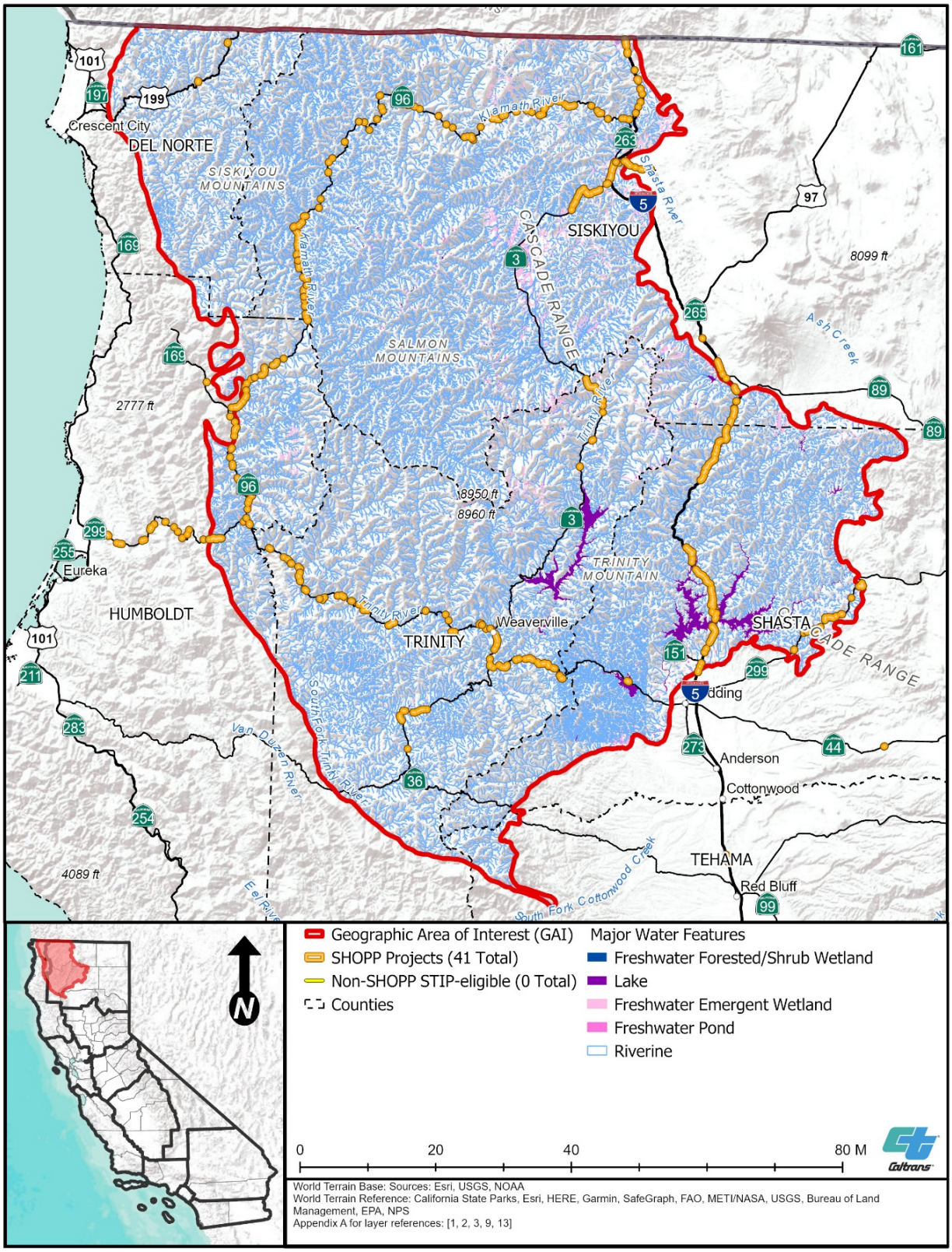
2.16.1. Historical Context

The GAI is known for its extensive river systems, which support large anadromous fish populations. Historically, these river systems flowed unaltered and uninterrupted through riparian, conifer, and mixed hardwood-conifer forests. Over the past 200 years, the degradation and alteration of river systems have led to steep declines in anadromous fish populations. There was an 80 percent decrease in salmon and steelhead between the 1950s and 1990s. Primary factors for these declines include decreased instream flows resulting from water diversions and agricultural water use, installation of migration barriers, forestry and other land uses, and overharvesting of fish (CDFW 2015a).

In the past century, dams installed in major rivers in the GAI, including the Klamath and Trinity Rivers, have resulted in reduced flows, increased water temperature, accumulation of sediment behind dams, and loss of stream and riparian habitat (Litton 2003; Water Education Foundation 2022b). Additionally, past timber harvest practices have contributed to reduced overstory shading of stream channels and increased erosion around and sedimentation in waterways, resulting in altered channel shape and depth and increased water temperature (CDFW 2015a).

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

Figure 2-15. Aquatic Resource Features and Major Stream Systems[a]



[a] For greater detail, see Appendix G.

Other land uses that have historically affected aquatic resources in the GAI include ranching, mining, and fur trapping. In the 1800s, ranchers drained wetlands and overgrazed riparian areas, miners increased sedimentation and released mercury into waterways, and fur trappers decimated beaver populations, resulting in altered waterways from the lack of beaver dams (Litton 2003).

2.16.2. 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 2018a, 2021g). Based on a search of the fish habitat layer, 10 federally or state listed threatened or endangered fish species 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
- federal candidate and state threatened upper Klamath and Trinity Rivers ESU chinook salmon
- federally and state threatened southern Oregon/northern California ESU coho salmon
- federally endangered tidewater goby (*Eucyclogobius newberryi*)
- federally threatened and state endangered bull trout (*Salvelinus confluentus*)
- federally threatened Central Valley DPS steelhead (*Oncorhynchus mykiss irideus* pop. 11)
- federally threatened southern DPS Pacific eulachon (*Thaleichthys pacificus*)
- federal candidate for listing and state threatened longfin smelt (*Spirinchus thaleichthys*)
- state threatened rough sculpin (*Cottus asperrimus*)

As described previously in Section 2.9, the GAI includes NMFS-designated EFH for chinook and coho salmon. Bull trout was historically found in the Klamath and McCloud Rivers but is now extinct in California (Moyle et al. 2017). Pacific eulachon and longfin smelt are found in the Klamath River (CDFW 2018d; NMFS 2017b). Rough sculpin is found in the Pit River (FWS 2015).

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

2.16.3. Wetlands

Wetland resources information for the GAI was extracted from the SAMNA Reporting Tool, which relies on the FWS National Wetlands Inventory maps (FWS 2021b), and data from the San Francisco Estuary Institute (2018) California Aquatic Resource Inventory (Table 2-5, Appendix G; Caltrans 2021e). These data were used to estimate the extent of wetlands in the GAI; however, the data layers are largely based on aerial imagery, have not been ground-truthed, provide no information on plant species associated with mapped areas, and, hence, are relatively coarse. Although suitable for advance mitigation project scoping, site-specific wetland studies that result in more detailed mapping and classification of wetland aquatic resources would be required for advance mitigation projects to establish compensatory mitigation credits. For example, under Section 404 of the CWA, the Corps considers wetlands to be jurisdictional WOTUS only if they have the three parameters of hydrology, hydrophytic vegetation, and hydric soils, and satisfy criteria to be connected to a traditionally navigable water.

Aquatic resource types outlined here follow the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). The SAMNA Reporting Tool wetlands data layer is separate from the land cover types discussed previously in Section 2.5; therefore, total acreages of wetland land cover types presented in Table 2-2 may not align with those presented in Table 2-5 (Caltrans 2021e).

2.16.4. Non-wetland Waters

Other, non-wetland water resources information for the GAI was extracted from the SAMNA Reporting Tool, which relies on the USGS National Hydrography Dataset (Table 2-5, Appendix G; Caltrans 2021f). Although suitable for advance mitigation project scoping, site-specific studies that result in more detailed mapping and classification of other, non-wetland aquatic resources would be required for advance mitigation projects to establish compensatory mitigation credits. Similar to the wetlands data, the waters data layer is separate from the land cover types discussed previously in Section 2.5; therefore, total acreages of water land cover types presented in Table 2-2 may not align with those presented in Table 2-5 (Caltrans 2021f).

2.17 Riparian Habitat

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

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

Type	Applegate (acres) 17100309	Clear Creek-Sacramento River (acres) 18020154	Cottonwood Creek (acres) 18020152	Cow Creek (acres) 18020151	Illinois (acres) 17100311	Lower Klamath (acres) 18010209	Lower Pit (acres) 18020003	Mad-Redwood (acres) 18010102	McCloud (acres) 18020004	Sacramento Headwaters (acres) 18020005	Salmon(acres) 18010210	Scott (acres) 18010208	Shasta (acres) 18010207	Smith (acres) 18010101	South Fork Trinity (acres) 18010212	Trinity (acres) 18010211	Upper Klamath (acres) 18010206	Total (acres)
Depressional Natural Emergent	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	**<0.1**
Depressional Natural Forested	Not mapped	Not mapped	Not mapped	Not mapped	0.1	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	**0.1**
Depressional Natural Shrub-Scrub	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	**<0.1**
Depressional Perennial Natural Emergent	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	**<0.1**
Depressional Perennial Natural Non-vegetated	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	<0.1	<0.1	Not mapped	Not mapped	<0.1	Not mapped	**<0.1**
Depressional Perennial Natural Vegetated	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	<0.1	Not mapped	Not mapped	Not mapped	<0.1	<0.1	**<0.1**
Depressional Perennial Non-vegetated	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	46.3	226.5	Not mapped	124.4	310.0	40.4	33.8	Not mapped	Not mapped	3.4	286.6	Not mapped	**1,071.5**
Depressional Perennial Unnatural Emergent	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	Not mapped	Not mapped	<0.1	<0.1	**<0.1**
Depressional Perennial Unnatural Non-vegetated	Not mapped	<0.1	<0.1	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	**<0.1**
Depressional Perennial Unnatural Vegetated	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	<0.1	Not mapped	<0.1	<0.1	Not mapped	Not mapped	<0.1	<0.1	**<0.1**
Depressional Seasonal Natural Emergent	<0.1	<0.1	<0.1	<0.1	Not mapped	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	<0.1	<0.1	Not mapped	Not mapped	<0.1	0.6	**0.6**
Depressional Seasonal Natural Forested	<0.1	<0.1	<0.1	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	<0.1	<0.1	<0.1	<0.1	Not mapped	Not mapped	<0.1	<0.1	**<0.1**
Depressional Seasonal Natural Non-vegetated	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	**<0.1**
Depressional Seasonal Natural Shrub-Scrub	1.5	<0.1	<0.1	<0.1	Not mapped	0.1	<0.1	Not mapped	<0.1	<0.1	<0.1	<0.1	<0.1	Not mapped	Not mapped	<0.1	28.3	**29.9**
Depressional Seasonal Unnatural Emergent	Not mapped	<0.1	<0.1	<0.1	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	Not mapped	Not mapped	<0.1	<0.1	**<0.1**
Depressional Seasonal Unnatural Forested	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	**<0.1**
Depressional Seasonal Unnatural Non-vegetated	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	Not mapped	<0.1	<0.1	Not mapped	Not mapped	Not mapped	<0.1	**<0.1**

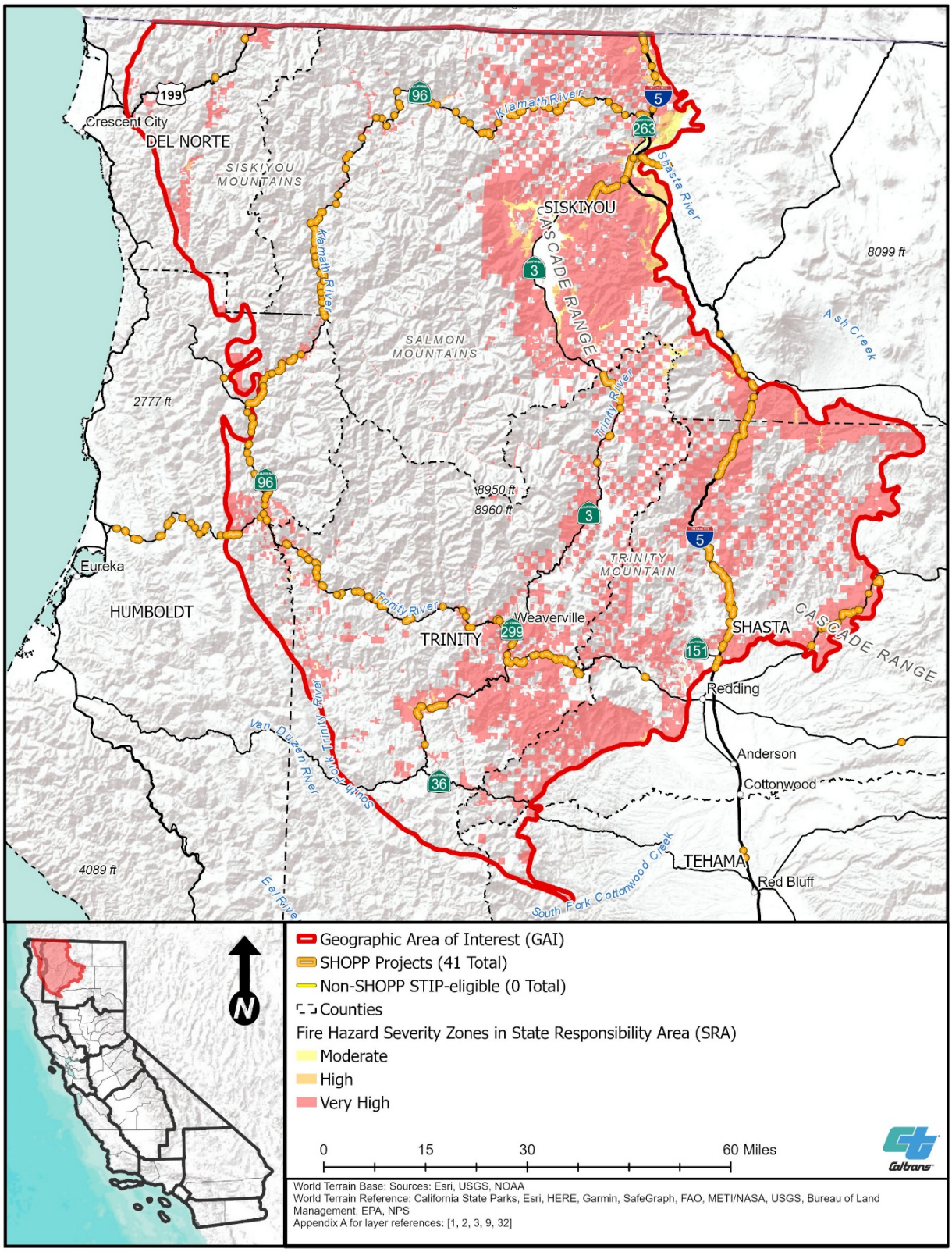
Type	Applegate (acres) 17100309	Clear Creek-Sacramento River (acres) 18020154	Cottonwood Creek (acres) 18020152	Cow Creek (acres) 18020151	Illinois (acres) 17100311	Lower Klamath (acres) 18010209	Lower Pit (acres) 18020003	Mad-Redwood (acres) 18010102	McCloud (acres) 18020004	Sacramento Headwaters (acres) 18020005	Salmon(acres) 18010210	Scott (acres) 18010208	Shasta (acres) 18010207	Smith (acres) 18010101	South Fork Trinity (acres) 18010212	Trinity (acres) 18010211	Upper Klamath (acres) 18010206	Total (acres)
Depressional Seasonal Unnatural Shrub-Scrub	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	**<0.1**
Freshwater Emergent Wetland	85.7	50.8	202.3	74.5	3.7	92.9	166.5	Not mapped	742.9	763.5	184.3	5,948.4	772.5	8.7	62.1	1,774.6	467.7	**11,401.1**
Freshwater Forested/Shrub Wetland	453.8	655.9	283.2	211.7	48.8	802.6	669.0	Not mapped	1,134.4	1,032.2	969.8	3,129.8	429.4	610.3	253.0	3,307.1	2,500.1	**16,491.2**
Freshwater Pond	16.7	113.0	45.5	16.0	4.9	194.3	14.8	Not mapped	1.9	179.7	347.4	483.7	105.5	29.0	41.0	503.3	64.5	**2,161.3**
Ice Mass	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	52.3	Not mapped	**52.3**
Lacustrine Natural Non-vegetated	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	<0.1	<0.1	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	**<0.1**
Lacustrine Unnatural Non-vegetated	Not mapped	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	<0.1	<0.1	Not mapped	Not mapped	Not mapped	Not mapped	Not mapped	<0.1	Not mapped	**<0.1**
Lake	Not mapped	3,762.3	93.5	Not mapped	Not mapped	116.9	12,741.5	Not mapped	5,261.7	13,523.2	193.6	238.9	25.9	Not mapped	42.7	17,185.0	Not mapped	**53,185.0**
Riverine	520.1	2,785.9	1,870.3	344.6	447.2	10,680.9	2,555.7	0.3	2,286.5	4,276.9	7,767.7	8,356.0	1,386.1	3,609.0	7,351.5	15,150.2	4,342.3	**73,731.4**
Total[a]	**1,078**	**7,368**	**2,495**	**647**	**505**	**11,934**	**16,374**	**0.3**	**9,552**	**20,086**	**9,503**	**18,191**	**2,719**	**4,257**	**7,754**	**38,259**	**7,404**	**158,124**

Source: Caltrans (2021e, 2021f)
[a] Rounded to the nearest whole number.

2.18 Fire Hazard Severity Zones

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

Figure 2-16. Fire Hazard Severity Zones



3. RELEVANT PLANS, POLICIES, AND REGULATIONS

This chapter summarizes the references applicable to the GAI that, when relevant, Caltrans will consult when conceptualizing advance mitigation projects. The table is organized by subject: laws and regulations, statewide and regional resource management plans, plans and permits focused on the species of mitigation need, resource agency land management plans (separated by agency), water resources plans and documents, county and city general plans, and other organization conservation and management documents. HCPs, NCCPs, and RCIS documents are discussed separately in Chapter 4, *Existing Mitigation Opportunities,* because they represent or support current compensatory mitigation credit purchase opportunities for Caltrans. Table 3-1 provides the following information for each reference identified:

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

The list of relevant documents, policies, and regulations in Table 3-1 is not exhaustive. Additional relevant resources may be consulted by Caltrans as advance mitigation planning is conceptualized. When conducting advance mitigation project scoping, Caltrans will check to determine whether it has the most up-to-date version of a particular reference.

3.1 Relationship to Goals and Objectives

As pointed out in Chapter 1, *Introduction*, the GAI for this RAMNA was selected by Caltrans District 2 based on the SAMNA results and other information. Caltrans District 2 specifically identified compensatory mitigation for the foothill yellow-legged frog, Shasta and Samwel salamanders, fisher, and aquatic resources as historical and anticipated

mitigation needs. Hence, Table 3-1 emphasizes documents related to the specified wildlife and aquatic resources, which, in turn, form the basis for the goals and objectives presented in Chapter 7, *Wildlife Resources Conservation Goals and Objectives*, and Chapter 8, *Aquatic Resources Conservation Goals and Objectives*. As much as practicable, however, Caltrans intends for any compensatory mitigation established in the GAI to support these specific wildlife and aquatic resources to benefit other wildlife and aquatic resources as well.

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

Title	Status	Spatial Data	Reference Purpose	Link	Date
State Laws, Guidelines, and Regulations	See below	See below	See below	See below	See below
California Fish and Game Commission Wetlands Resources Policy	Updated periodically	No	California Fish and Game 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 SWRCB and RWQCBs. Goals include implementing strategies to fully support beneficial uses for all water bodies listed in the 2006 report, improve and protect groundwater quality, increase sustainable local water supplies available for meeting beneficial uses by 1,725,000 acre-feet per year, comprehensively address water quality protection and restoration, improve transparency and accountability within the SWRCB and RWQCBs, enhance consistency across the SWRCB and RWQCBs, and ensure that the SWRCB and RWQCBs have access to information and expertise.	https://www.waterboards.ca.gov/water_issues/hot_topics/strategic_plan/docs/2010/final_strategic_plan_update_report_062310.pdf	6/1/2010
CESA	Updated periodically (by California legislature)	No	CESA prohibits the take of any species of wildlife designated by the California Fish and Game Commission as an endangered, threatened, or candidate species. CDFW may authorize the take of any such species by permit if the conditions set forth in FGC § 2081, subdivisions (b) and (c), are met. (See California Code of Regulations, Title 14, § 783.4.)	https://www.wildlife.ca.gov/Conservation/CESA	9/10/2018 (last amended)
Executive Order W-59-93	Final	No	Governor of California's directive for a no net loss policy on the quantity, quality, and permanence of wetland acreages and values.	https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/wrapp2008/executive_order_w59_93.pdf	8/23/1993
Native Plant Protection Act	Final	No	Enacted in 1977, the Act allows the California Fish and Game Commission to designate plants as rare or endangered. There are 64 species, subspecies, and varieties of plants that are protected as rare under the Native Plant Protection Act. The Act prohibits take of endangered or rare native plants but includes some exceptions for agricultural and nursery operations and emergencies, and after properly notifying CDFW for vegetation removal from canals, roads, and other sites; changes in land use; and in certain other situations.	https://leginfo.legislature.ca.gov/faces/codes_displayText.xhtml?division=2.&chapter=10.&lawCode=FGC	1/1/1977
Porter-Cologne Water Quality Control Act	Updated periodically (by California legislature)	No	Law that governs water quality in California, establishing the nine RWQCBs and their jurisdiction to protect California's surface water and groundwater through water quality objectives and the beneficial uses of water as outlined in a project's waste discharge requirements.	https://www.waterboards.ca.gov/laws_regulations/docs/portercologne.pdf	1/1/2019 (last amended)
State Board Resolution No. 68-16	Final	No	Policy for maintaining high water quality.	https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf	10/28/1968
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	Final	No	Implemented by the SWRCB. Creates a State of California wetland definition, a framework for determining jurisdiction of state wetlands, wetland delineation procedures, and application procedures for discharges of dredge and fill material to waters of the state.	https://www.waterboards.ca.gov/water_issues/programs/cwa401/wrapp.html	5/28/2020 (effective date)
Streambed Alteration Program FGC § 1602	Updated periodically (by California legislature)	No	Implemented by CDFW. Regulates activities that may substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. In general terms, CDFW jurisdiction extends to top-of-bank of the outer extent of riparian habitat, if present. Additionally, CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and habitat necessary for biologically sustainable populations of those species.	https://www.wildlife.ca.gov/conservation/lsa	6/27/2017 (last amended)
Water Quality Control Plan for the Central Valley Region	Updated periodically	Yes	Implemented by Central Valley Basin RWQCB. Establishes general and site-specific water quality standards and objectives in the Sacramento River Basin.	https://www.waterboards.ca.gov/centralvalley/water_issues/basin_plans/ - basinplans	2/19/2019 (last revision)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Water Quality Control Plan for the North Coast Region	Updated periodically	Yes	Implemented by North Coast Region RWQCB. Establishes general and site-specific water quality standards and objectives in the Klamath River and North Coastal Basins.	https://www.waterboards.ca.gov/northcoast/water_issues/programs/basin_plan/basin_plan_documents/	6/20/2018 (last updated)
Federal Laws, Guidelines, and Regulations	See below	See below	See below	See below	See below
2008 Final Compensatory Mitigation Rule	Final	No	Corps' ruling to establish standards and criteria for the use of all types of compensatory mitigation, including on- and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts on WOTUS.	https://www.govinfo.gov/content/pkg/CFR-2012-title33-vol3/xml/CFR-2012-title33-vol3-part332.xml	7/9/2008
303(d) List of Impaired Water Bodies	Updated periodically	No	EPA and SWRCB's listing of regulated impaired water bodies.	https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2018_integrated_report.html	4/11/2018 (last updated)
40 CFR § 131.12 California Antidegradation Policy	Final	No	Implemented by SWRCB. Required by federal law, the Antidegradation Policy applies to the disposal of waste to high-quality surface water and groundwater.	https://www.waterboards.ca.gov/plans_policies/antidegradation.html	8/21/2015 (last amended)
Corps Regulatory Guidance Letter 18-01	Final	No	Corps' guidance document on determining compensatory mitigation credits for the removal of obsolete dams and other structures from rivers and streams.	https://usace.contentdm.oclc.org/utils/getfile/collection/p16021coll9/id/1473	9/25/2018
CWA	Updated periodically (by Congress)	No	Authorized by EPA and delegated to the Corps and SWRCB, the CWA establishes the basic structure for regulating discharges of pollutants into WOTUS and regulating quality standards for surface waters.	https://www.law.cornell.edu/uscode/text/33/1344	2/4/1987 (last amended)
CWA § 401	Updated periodically (by Congress)	No	Implemented by EPA and SWRCB. Regulates discharge of pollutants into WOTUS.	https://www.law.cornell.edu/uscode/text/33/1341	12/27/1977 (last amended)
CWA § 402 National Pollutant Discharge Elimination System MS4 Permit	Updated periodically (by Congress)	No	Implemented by EPA and SWRCB. Regulates discharge of stormwater from municipal sources that is a conveyance or system of conveyances and is: ▪ owned by a state, city, town, village, or other public entity that discharges to WOTUS; ▪ designed or used to collect or convey stormwater (e.g., storm drains, pipes, ditches); ▪ not a combined sewer; and ▪ not part of a sewage treatment plant or publicly owned treatment works.	https://www.epa.gov/npdes/stormwater-discharges-municipal-sources	1/19/2019 (last amended)
CWA § 404	Updated periodically (by Congress)	No	Implemented by EPA and the Corps. Regulates discharge of dredge or fill material into WOTUS.	https://www.epa.gov/cwa-404/section-404-permit-program	11/6/1986 (last amended)
ESA	Updated periodically (by Congress)	No	Authorizes FWS and NMFS to protect federally listed threatened and endangered species.	https://www.fws.gov/endangered/laws-policies/	11/24/2003 (last amended)
Executive Order 11990, Protection of Wetlands	Final	No	Aims to minimize the destruction, loss, or degradation of wetlands and preserve and enhance the natural and beneficial values of wetlands.	https://www.epa.gov/cwa-404/protection-wetlands-executive-order-11990	3/24/1977
Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division	Final	No	Corps' guidelines for mitigation and monitoring in the South Pacific Division, including California.	https://www.spd.usace.army.mil/portals/13/docs/regulatory/mitigation/mitmon.pdf	12/19/2014 (last amended)
National Wetlands Mitigation Action Plan	Final	No	EPA and Corps comprehensive, interagency document to further achievement of the goal of no net loss of wetlands and to set forth the no net loss policy.	https://www.epa.gov/cwa-404/national-wetlands-mitigation-action-plan	12/26/2002

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The Navigable Waters Protection Rule	In progress	No	The navigable waters protection rule, dated April 21, 2020, has been vacated by the court and implementation has been halted. Rulemakings to revise the rule are currently in progress.	https://www.epa.gov/nwpr/final-rule-navigable-waters-protection-rule	6/9/2021 (announcement of rulemaking process)
Section 10 of the Rivers and Harbors Appropriation Act of 1899	Updated periodically (by Congress)	No	Authorizes the Corps to protect navigable WOTUS by requiring a permit for construction of any structure over a navigable WOTUS. A Section 10 permit is required if the structure or work affects the course, location, or condition of the water body. The law applies to any dredging or disposal of dredged materials, excavation, filling, rechannelization, or any other modification of a navigable WOTUS.	https://www.epa.gov/cwa-404/section-10-rivers-and-harbors-appropriation-act-1899	7/26/1947 (last amended)
Section 14 of the Rivers and Harbors Appropriation Act of 1899	Updated periodically (by Congress)	No	Implemented by EPA and the Corps. Regulates the temporary occupation or use of any sea wall, bulkhead, jetty, dike, levee, wharf, pier or other work built by the United States.	https://www.law.cornell.edu/uscode/text/33/408	10/23/2018 (last amended)
Wild and Scenic Rivers Act	Final	Yes	Reserves certain rivers with outstanding natural, cultural, and recreational values in a free-flowing condition for the enjoyment of present and future generations. All federal agencies must seek to avoid or mitigate actions that would adversely affect National River Inventory river segments.	https://www.law.cornell.edu/uscode/text/16/chapter-28	12/19/2014 (last amended)
Statewide and Regional Resource Planning Documents	See below	See below	See below	See below	See below
A Climate Change Vulnerability Assessment of California's Terrestrial Vegetation	Final	Yes	CDFW's document to assess the climate vulnerability of terrestrial vegetation.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=116208&inline	1/1/2016
A Strategy for California @ 50 Million – Supporting California's Climate Change Goals	Final	Yes	Planning report from the California Governor's Office that focuses on sustainability efforts across California in response to climate change.	http://opr.ca.gov/docs/EGPR_Nov_2015.pdf	11/1/2015
ACE Connectivity Project Version 3.0	Updated periodically	Yes	A CDFW effort to analyze large amounts of map-based data to inform decisions around goals such as biodiversity conservation, habitat connectivity, and climate change resiliency.	https://wildlife.ca.gov/Data/Analysis/ACE	7/10/2019 (last updated)
California Biodiversity Initiative	Final	No	A CNRA, California Department of Food and Agriculture, and Governor's Office of Planning and Research high-level planning document. Provides a roadmap to secure California's biodiversity future.	https://californiabiodiversityinitiative.org/pdf/california-biodiversity-action-plan.pdf	9/2018
California Essential Habitat Connectivity Project	Final	Yes	CDFW and Caltrans assessment to identify large remaining blocks of intact habitat or natural landscape and model linkages between them that need to be maintained, particularly as corridors for wildlife.	https://www.wildlife.ca.gov/conservation/planning/connectivity/CEHC	2/1/2010
California Water Action Plan 2016 Update	Final	No	Calls for action to restore key mountain meadow habitat, manage headwaters, restore coastal watersheds, and enhance water flows in streams statewide.	http://resources.ca.gov/docs/california_water_action_plan/Final_California_Water_Action_Plan.pdf	2016
California Watershed Assessment Manual Volume I	Final	No	Provides guidance for conducting a watershed assessment in California.	https://www.epa.gov/system/files/documents/2022-02/caliwam.pdf	5/1/2005
California Wildlife Barriers: 2020 Priority Wildlife Movement Barrier Locations by Region	Final	Yes	CDFW's priority wildlife movement barriers across the state. This document is focused on large wild mammal game species; however, some priorities would benefit special-status species such as bighorn sheep.	http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178511	3/1/2020

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Caltrans Adaptation Strategies Report: District 2	Final	No	Caltrans initiated a major agency-wide effort to adapt its infrastructure so that it can withstand future conditions. The effort began by determining which assets are most likely to be adversely affected by climate change in each Caltrans District.	https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2020-adaptation-priorities-reports	3/1/2020
Caltrans Climate Change Vulnerability Assessment, District 2 Technical Report	Final	No	Caltrans assessment of climate change vulnerabilities for Caltrans District 2.	https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2019-climate-change-vulnerability-assessments	7/1/2018
Technical Memorandum Development, Land Use, and Climate Change Impacts on Wetland and Riparian Habitats – A Summary of Scientifically Supported Conservation Strategies, Mitigation Measures, and Best Management Practices	Final	No	Technical memo written by CDFW about impacts on wetland habitats, along with conservation strategies, mitigation measures, and best management practices.	https://wildlife.ca.gov/Regions/1	5/21/2014
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
Record of Decision for Amendments to Forest Service and BLM Planning Documents within the Range of the Northern Spotted Owl	Final	No	This document, colloquially referred to as The Northwest Forest Plan, is a landscape approach to federal land management designed to protect threatened and endangered species while also contributing to social and economic sustainability in the region. It also includes an Aquatic Conservation Strategy, which aims to restore and maintain the ecological health of watersheds and aquatic ecosystems.	https://www.fs.usda.gov/detail/r6/landmanagement/planning/?cid=fsbdev2_026990	4/13/1994
Safeguarding California Plan: 2018 Update	Final	No	A conservation plan by CNRA. Includes goals to strengthen the climate adaptation component of conservation planning efforts, enhance habitat connectivity, protect climate refugia through strategic acquisition and protection activities, increase restoration and enhancement activities to increase climate resiliency of natural and working lands, increase biodiversity monitoring efforts, continue incorporating climate considerations into state investment decision processes, and provide educational opportunities to the public and state agency staff regarding climate impacts and adaptation options.	http://resources.ca.gov/docs/climate/safeguarding/update2018/safeguarding-california-plan-2018-update.pdf	1/1/2018
SWAP	Updated periodically (5-year intervals)	Yes	CDFW's plan for protection of species of greatest conservation need, in addition to habitats and other wildlife in California.	https://www.wildlife.ca.gov/SWAP/Final	9/1/2015
SWAP Transportation Companion Plan	Final	Yes	CDFW's companion document to SWAP for protection of species specific to transportation project planning.	https://wildlife.ca.gov/SWAP/Final/Companion-Plans	12/1/2016
SWAP Water Management Companion Plan	Final	Yes	CDFW's companion document to SWAP to recommend water management practices throughout the state of California.	https://wildlife.ca.gov/SWAP/Final/Companion-Plans	12/1/2016
Special-Status Taxa[a] Documents	See below	See below	See below	See below	See below
Recovery Plan for Fisher	Not available	Not available	A recovery plan for this species has not been written. A recovery outline has been prepared only for the fisher southern Sierra Nevada DPS located outside of the GAI.	https://ecos.fws.gov/ecp/species/3651	Not available

Title	Status	Spatial Data	Reference Purpose	Link	Date
Fisher 5-Year Review	Not available	Not available	FWS has not completed a 5-year review of this species.	https://ecos.fws.gov/ecp/species/3651	Not available
Critical Habitat Designation for Fisher	Draft	Yes	FWS' designation of critical habitat for this species has been prepared only for the fisher southern Sierra Nevada DPS located outside of the GAI. The designation has been proposed for an update since the prior designation in 2021.	https://ecos.fws.gov/ecp/species/3651	11/7/2022
Threatened Species Status for West Coast Distinct Population Segment of Fisher with Section 4(d) Rule	Final	Yes	FWS's current proposed rule for fisher West Coast DPS status. Proposal currently under review and there is no current federal listing of the species.	https://www.govinfo.gov/content/pkg/FR-2019-11-07/pdf/2019-23737.pdf - page=1	11/07/2019
Fisher Biological Opinions	Updated periodically	No	FWS' list of the four most recent biological opinions that have been used for fisher, of which none were for projects in the GAI.	https://ecos.fws.gov/ecp/species/3651	6/12/2020 (latest document)
Report to the Fish and Game Commission. A Status Review of the Fisher in California	Final	Yes	CDFW's formal status review of fisher in California for the purpose of making a listing decision under CESA.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=101470&inline	5/12/2015
Habitat Connectivity for Fishers and Martens in the Klamath Basin Region of California and Oregon	Final	Yes	Conservation Biology Institute's analysis of landscape connectivity for fisher in the mid-Klamath Basin. Conducted with assistance and input from FWS and USFS.	https://consbio.org/reports/habitat-connectivity-for-fishers-martens-in-the-klamath-basin-region-of-ca-or/	8/1/2019
American Marten, Fisher, Lynx, and Wolverine: Survey Methods for Their Detection	Final	No	USFS survey protocol for fisher.	https://www.fs.usda.gov/psw/publications/documents/psw_gtr157/psw_gtr157.pdf	8/1/1995
Endangered and Threatened Wildlife and Plants; Foothill Yellow-Legged Frog; Threatened Status With Section 4(d) Rule for Two Distinct Population Segments and Endangered Status for Two Distinct Population Segments	In progress	Yes	FWS's current proposed rule for foothill yellow-legged frog DPS locations and species status for each DPS. The GAI overlaps with the North Coast DPS of foothill yellow-legged frog.	https://www.govinfo.gov/content/pkg/FR-2021-12-28/pdf/2021-27512.pdf - page=1	12/28/2021
Species Status Assessment Report for the Foothill Yellow-legged Frog (*Rana boylii*)	Final	Yes	FWS' foothill yellow-legged frog status assessment for the purpose of making a listing decision under the federal ESA. The GAI overlaps with the North Coast California Analysis Unit.	https://ecos.fws.gov/ecp/species/5133	10/21/2021
Report to the Fish and Game Commission. A Status Review of the Foothill Yellow-Legged Frog (*Rana boylii*) in California	Final	Yes	CDFW's formal report on the status of foothill yellow-legged frog. The GAI overlaps with the Northwest/North Coast Clade.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=174663&inline	9/20/2019
Considerations for Conserving the Foothill Yellow-Legged Frog	Final	No	CDFW's document 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
Incidental Take Permits for Foothill Yellow-Legged Frog	Updated periodically	No	CDFW's list of incidental take permits issued for foothill yellow-legged frog from its publicly available document search website. Eleven documents are listed in the search.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	10/29/2018 (latest document)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Visual Encounter Survey Protocol for *Rana boylii* in Lotic Environments	Final	No	Survey protocol, written with the assistance of USFS, for foothill yellow-legged frog.	https://watershed.ucdavis.edu/sites/g/files/dgvnsk8531/files/products/2021-11/CWS%20FYLF%20VES%20Survey%20Protocol-Final%281%29.pdf	6/1/2017
A Standardized Approach for Habitat Assessments and Visual Encounter Surveys for the Foothill Yellow-legged Frog (*Rana boylii*)	Final	No	Survey protocol for foothill yellow-legged frog and its habitat, created by Pacific Gas and Electric.	https://relicensing.pcwa.net/documents/Library/PCWA-L-270.pdf	5/1/2002
Species Status Assessment Report for the Shasta Salamander Complex (*Hydromantes shastae*, *H. samweli*, and *H. wintu*)	Final	Yes	FWS' Shasta salamander status assessment for consideration in determining whether to list the species under the federal ESA. All three species in the Shasta salamander complex were found not warranted for listing under ESA. All analytical units for the Shasta salamander complex are located in the GAI.	https://ecos.fws.gov/ecp/species/6607	5/5/2021
Five-year Status Report: Shasta Salamander	Final	No	CDFW's formal 5-year status report for Shasta salamander.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=46587	1/1/1987
Incidental Take Permits for Shasta Salamander	Not available	No	CDFW's list of incidental take permits issued for Shasta salamander from its publicly available document search website. No documents are listed in the search; however, two permits are known to have been issued for this species.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	Not available
State Land Management Plans	See below	See below	See below	See below	See below
General Planning Handbook for California State Parks	Final	Yes	California State Parks' guidelines for general plan development, which requires an inventory of known natural resources and general guidelines to comply with federal and state laws. State Park entities with information pertinent to Chapters 7 and 8 of this RAMNA are listed below.	http://www.parks.ca.gov/pages/21299/files/planning_handbook_april_2010.pdf	4/1/2010
Del Norte Coast Redwoods State Park Final General Plan Amendment/ Environmental Impact Report Mill Creek Addition	Final	No	Amendment to the Redwood State and National Parks General Management Plan for Del Norte Coast Redwoods State Park. Requires buffers around old growth on trails (500 feet), old growth on new facilities (0.25 mile), and fish bearing streams (200 feet).	https://www.parks.ca.gov/?page_id=24651	10/8/2010
Redwood State and National Parks General Management Plan	Final	No	NPS' and California State Parks' joint management plan for Jedediah Smith Redwoods State Park, Del Norte Coast Redwoods State Park, and Prairie Creek Redwoods State Park. Jedediah Smith Redwoods State Park and Del Norte Coast Redwoods State Park overlap with the GAI. Establishes goals for the weed treatment of 9.5 miles per year of roads for watershed restoration.	https://www.parks.ca.gov/?page_id=24851	11/19/1999
Weaverville Joss House State Historic Park General Plan	Final	No	California State Parks' management plan for Weaverville Joss House State Historic Park. A fisher record occurs less than 1 mile north of the park. Includes goals for the management of black locusts by pruning or removing infested trees and replacing with the appropriate trees. Includes goals for habitat restoration at Sidney Gulch and Weaver Creek.	https://www.parks.ca.gov/?page_id=24365	1/12/1990

Title	Status	Spatial Data	Reference Purpose	Link	Date
FWS Land Management Plans	See below	See below	See below	See below	See below
Not applicable	Not applicable	Not applicable	No FWS-managed lands are located in the GAI.	Not applicable	Not applicable
U.S. Military Land Management Plans	See below	See below	See below	See below	See below
Not applicable	Not applicable	Not applicable	No active military facilities with a land management plan occur in the GAI.	Not applicable	Not applicable
U.S. Bureau of Indian Affairs Land Management Plans	See below	See below	See below	See below	See below
Pit River Tribe Environmental Programs Office	Not applicable	Not applicable	Pit River Tribe Environmental Programs Office notes several documents related to water quality monitoring. No land management plans appear to be publicly available.	http://pitrivertribe.org/environmental/	Not applicable
Hoopa Valley Tribal Reservation Forest Management Plan	Not publicly available	Unknown	The Forest Management Plan is not publicly available but can be requested and issued at the discretion of the Forest Manager.	http://www.hoopaforestry.com/planning.html	4/22/2011 (last updated)
Upper Klamath Basin Nonpoint Source Pollution Assessment and Management Program Plan	Draft	No	Klamath Tribal Water Quality Consortiums' plan for managing water pollution on tribal lands. The consortium consists of the Yurok Tribe, Karuk Tribe, Hoopa Valley Tribe, Resighini Rancheria, and Quartz Valley Indian Reservation.	http://www.qvir.com/news--events.html	8/1/2016
Yurok Tribe Wetlands Program Plan	Final	No	Yurok Tribes' programmatic plan for monitoring and protecting wetlands on Yurok Reservation lands.	https://www.yuroktribe.org/community-and-ecosystems-reports	4/12/2011
Yurok Tribe Water Quality Control Plan	Updated periodically	No	Water quality control plan for the Yurok Tribe.	https://yurok.tribal.codes/YTC/21.25	8/25/2004
Yurok Tribe Wetlands Protection Tribal Code	Updated periodically	No	Wetlands protection code for the Yurok Tribe.	https://yurok.tribal.codes/YTC/21.55	5/21/2020
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.fs.usda.gov/detail/stnf/landmanagement/?cid=STELPRDB5411675	1/1/2013
Klamath National Forest Land and Resource Management Plan	Final	Yes	USFS' management plan for the Klamath National Forest. Pacific fisher and foothill yellow-legged frog are known to occur in the forest. Includes goals to manage a wildlife area west of Indian Creek in the GAI where fisher are known to occur. A riparian reserve management area occurs in the GAI. This area includes a goal to restore intermittent streams, in part by planting willows.	https://www.fs.usda.gov/main/klamath/landmanagement/planning	7/29/2010
Managing Sierra Nevada Forests	Final	No	USFS' published collection of papers summarizing the state of the science on topics relevant to this forest management approach and presenting case studies of collaborative planning efforts and field implementation of these new practices.	https://pitmodoc.opennrm.org/docs/416	3/1/2012
Rogue River National Forest Land and Resource Management Plan	Final	No	USFS' management plan for the Rogue River National Forest. Includes general goals to enhance riparian habitat and watersheds and specific goals to improve water quality and streamflow in the Ashland, Medford, and Talent municipal watersheds.	https://www.fs.usda.gov/main/rogue-siskiyou/landmanagement/planning	7/1/1990

Title	Status	Spatial Data	Reference Purpose	Link	Date
Shasta-Trinity National Forest Land and Resource Management Plan	Final	No	USFS' management plan for the Shasta-Trinity National Forest. Finalized in 1995, the plan states that fisher are known to occur in the Corral Bottom Management Area located in the southwest portion of the Big Bar District adjacent to the northern boundary of the Hayfork Ranger District. Shasta salamander are known to occur in Trinity Unit of the natural resource area, including lands around Clair-Engle (Trinity) Lake, and the Nosoni Management Area, around Brock Mountain. Both management areas have a supplemental management direction to improve habitat for Shasta salamander. As of 2022, fisher are known to occur in all management units of the Shasta-Trinity National Forest (C. Draguesku, FWS, personal communication, 2022).	https://www.fs.usda.gov/detailfull/stnf/landmanagement/planning/?cid=stelprdb5108815&width=full	4/28/1995
Six Rivers National Forest Land and Resource Management Plan	Final	Yes	USFS' management plan for the Six Rivers National Forest. Fisher are known to occur in the forest. Contains guidelines that prioritize the Smith River, Klamath River tributaries, Trinity River tributaries, Mad River tributaries, and North Fork Eel River for restoration.	https://www.fs.usda.gov/detailfull/srnf/landmanagement/planning/?cid=stelprdb5084033	1/1/1995
Siskiyou National Forest Land and Resource Management Plan	Final	No	USFS' management plan for the Siskiyou National Forest. Foothill yellow-legged frog are known to occur in the Proposed Cedar Log Flat Research Natural Area. Fisher are known to occur in the forest as well. The plan includes general goals to improve riparian habitat, fish habitat, and watersheds. There are goals to enhance salmonid fish habitat in riparian management areas.	https://www.fs.usda.gov/main/rogue-siskiyou/landmanagement/planning	3/1/1989
Smith River National Recreation Area Management Plan	Final	No	USFS' management plan for the Smith River National Recreation Area. Includes goals to restore designated streamside protection zones of classified river corridors and to restore and enhance Rattlesnake Lake and associated meadows, springs, and waterholes.	https://www.rivers.gov/management-plans.php	10/1/1992
BLM Land Management Plans	See below	See below	See below	See below	See below
Arcata Planning Area Record of Decision for Resource Management Plan and Environmental Impact Statement	In progress	No	BLM's record of decision for the resource management plan for the Arcata Field Office.	https://eplanning.blm.gov/eplanning-ui/project/72947/570	2/13/2017
Northwest California Integrated Resource Management Plan	In progress	Not applicable	BLM's resource management plan covering the Redding and Arcata Field Offices that is currently in development. Note: This document has been superseded by fire recovery efforts and the project might ultimately be abandoned.	https://www.blm.gov/programs/planning-and-nepa/plans-in-development/california/northwest-california-integrated-rmp	In progress
Proposed Redding Resource Management Plan and Final Environmental Impact Statement	Final	No	BLM's resource management plan for the Redding Field Office. The Shasta salamander is known to occur within limestone outcrops around the Shasta Lake area. Includes goals for the enhancement of northern spotted owl habitat, including parcels at Eastman Gulch in the Trinity Management Area, Iron Dyke in the Klamath Management Area, and Crater Creek in the Scott Valley Management Area. Also includes goals for the enhancement of several stream systems.	https://eplanning.blm.gov/eplanning-ui/project/75497/570	8/8/1992
NPS Land Management Plans	See below	See below	See below	See below	See below
Nationwide Rivers Inventory	Final	Yes	Listing of Nationwide River Inventory river segments that are potential candidates for inclusion in the National Wild and Scenic Rivers System. Listed national river segments in the GAI include the Smith, Trinity, and Klamath Rivers.	https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm	12/21/2017
Foundation Document Redwood National and State Parks	Final	No	NPS' and California State Parks' supplemental joint management plan for Redwood National Park and Redwood State Parks. Identifies goals for the restoration of degraded watersheds, forests, and streams in the Redwood National Park expansion area and the Mill Creek watershed in Del Norte Coast Redwoods State Park.	https://parkplanning.nps.gov/documentsList.cfm?parkID=336&projectID=59624	9/1/2016
Paige Boulder Watershed Restoration Project Overview	Final	No	NPS' overview of the Paige Boulder Watershed Restoration Project. Includes background information within the Whiskeytown National Recreation Area.	https://parkplanning.nps.gov/document.cfm?parkID=345&projectID=53726&documentID=60438	8/22/2014

Title	Status	Spatial Data	Reference Purpose	Link	Date
Redwood State and National Parks General Management Plan	Final	No	NPS' and California State Parks' primary joint management plan for Redwood National Park and Redwood State Parks.	https://www.parks.ca.gov/?page_id=24851	5/23/2001
Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment	Final	No	NPS' invasive plant management plan for Redwood National Park. Identifies a number of invasive plant targets for removal from the park, including Himalayan blackberry.	https://parkplanning.nps.gov/document.cfm?parkID=341&projectID=44351&documentID=83505	12/1/2017
Whiskeytown National Recreation Area Foundation Document	Final	No	NPS' foundation document for Whiskeytown National Recreation Area. Includes goals for the ongoing restoration of Whiskeytown Lake and its tributaries.	https://parkplanning.nps.gov/document.cfm?parkID=345&projectID=49437&documentID=61120	12/20/2013
Local Government Land Management Plans	See below	See below	See below	See below	See below
North Coast Resource Partnership Plan	Final	Yes	North Coast Resource Partnerships' plan for resource use and conservation planning in northern coastal California. The partnership is between indigenous tribes and county governments. Includes general goals for improving water quality and enhancing and/or restoring aquatic ecosystems, in particular coastal wetlands and streams inhabited by salmonids.	https://northcoastresourcepartnership.org/planning/	1/1/2020
Water Resources Plans and Documents	See below	See below	See below	See below	See below
Central Valley RWQCB TMDL Action Plans	Updated periodically	No	SWRCB and Central Valley RWQCB's list of TMDL action plans for the Central Valley Region. No action plans occur in the GAI.	https://www.waterboards.ca.gov/centralvalley/water_issues/tmdl/	Not applicable
Cottonwood Creek Strategic Watershed Plan	Final	No	Cottonwood Creek Watershed Group's plan for managing the Cottonwood Creek watershed. The plan was funded in part by the RWQCB and involved staff from USFS, RWQCB, FWS, CDFW, Caltrans, NMFS, and Tehama County.	https://www.fs.usda.gov/main/stnf/landmanagement/planning	12/1/2005
Implementation Plan for the Preferred Alternative of the Trinity River EIS/EIR	Final	No	Implementation guidelines that established the Trinity River Restoration Program. The document was a collaborative effort of CDFW, NMFS, USFS, FWS, Bureau of Reclamation, Hoopa Valley Tribe, Yurok Tribe, and Trinity County. The document outlines several planned restoration activities along the Trinity River.	https://www.trrp.net/program-structure/foundational-documents/	7/13/2000
North Coast RWQCB Watershed Management Planning Chapter	Final	Yes	North Coast RWQCB document on water quality conditions in its jurisdiction. Includes general goals to enhance beneficial uses in the jurisdictional area.	https://www.waterboards.ca.gov/northcoast/water_issues/programs/watershed_management/watershed_management_initiative/	2/1/2005
North Coast RWQCB TMDL Action Plans	Updated periodically	No	SWRCB and North Coast RWQCB's list of TMDL action plans for the North Coast Region. In the GAI, TMDL action plans exist for the Klamath and Scott Rivers.	https://www.waterboards.ca.gov/northcoast/water_issues/programs/tmdls/	12/28/2010 (most recent approval date)
Sustainable Groundwater Management Act Portal	Updated periodically	Yes	California Department of Water Resources' central website to find information about groundwater sustainability agencies and download groundwater sustainability plans. Groundwater sustainability agencies in the GAI include the Siskiyou County Flood Control and Water Conservation District. The district has groundwater sustainability plans for Scott River Valley and Shasta Valley.	https://sgma.water.ca.gov/portal/	Updated nearly continuously
Upper Sacramento River Anadromous Fish Habitat Restoration Program Environmental Assessment	Final	No	Bureau of Reclamation's restoration program to increase and improve Chinook salmon and steelhead habitat in the Upper Sacramento River region. An area just downstream of the Keswick Dam in the GAI has been selected for improvement.	https://sacriver.org/explore-watersheds/northeast-subregion/upper-sacramento-river-watershed/documents	1/1/2016

Title	Status	Spatial Data	Reference Purpose	Link	Date
Upper Sacramento River Fisheries and Riparian Habitat Management Plan	Final	No	A management plan by all California resource agencies, including CDFW and RWQCB, for the Upper Sacramento River fisheries and riparian habitat. Includes goals for the restoration of riparian habitat along the Sacramento River and its tributaries, including Clear and Spring Creeks near the Whiskeytown Reservoir in the GAI.	https://sacriver.org/explore-watersheds/northeast-subregion/upper-sacramento-river-watershed/documents	1/1/1989
County General Plans	See below	See below	See below	See below	See below
Humboldt County General Plan	Final	Yes	General plan for Humboldt County. The plan designates Streamside Management Areas, which have 200-foot buffers from development. The plan also requires a 100-foot buffer from non-designated perennial streams and a 50-foot buffer for non-designated intermittent streams. Wetlands that are seasonal have 50-foot buffers and perennial wetlands have 150-foot buffers. Development in these buffers carries additional mitigation requirements. Includes land use designations of forestry recreation, floodplain, and natural resources.	https://humboldtgov.org/205/General-Plan	10/23/2017
Shasta County General Plan	Updated periodically	No	General plan for Shasta County. Includes a strategy to restore the Middle Creek drainage basin, Clear Creek, and other Sacramento River tributary watersheds. There are no land use designations for conservation.	https://www.co.shasta.ca.us/index/drm/planning/general-plan	9/1/2004 (last amended)
Siskiyou County General Plan 1973	Updated periodically	No	General plan for Siskiyou County. There are no land use designations for conservation.	https://www.co.siskiyou.ca.us/planning/page/general-plan	8/1/2014 (last updated)
Tehama County General Plan Update 2009–2029	Final	Yes	General plan for Tehama County. Includes goals and policies for the restoration of oak woodlands and a land use designation for conservation, including habitat resource, resource lands, and water.	https://www.co.tehama.ca.us/government/departments/planning-department/	3/1/2009
Trinity County General Plan	Final	Yes	General plan for Trinity County. The Denny, Junction City, North Lake, Salyer/Burnt Ranch, Big Bar, Weaverville, Lewiston/Douglas City, Hyampom, Hayfork, Wildwood, and South Fork planning areas overlap with the GAI. Includes land use designations for resource lands and open space/conservation areas.	https://www.trinitycounty.org/node/1901	4/1/2020 (last updated)
City General Plans	See below	See below	See below	See below	See below
Douglas City Community Plan	Final	No	General plan for Douglas City. Includes a land use designation for open space, equivalent to the 100-year floodplain of designated streams.	https://www.trinitycounty.org/node/1901	7/1/1987
City of Dunsmuir General Plan 2006–2025	Updated periodically	Yes	General plan for Dunsmuir. There is no land use designation for open space or conservation.	http://www.ci.dunsmuir.ca.us/planning-department	4/13/2009 (last updated)
City of Etna General Plan	Updated periodically	No	General plan for Etna. Includes land use designations for open space and floodplains.	https://www.etnaca.com/forms-documents	8/18/2005
Town of Fort Jones General Plan	Draft	Yes	General plan for Fort Jones. There is no land use designation for conservation.	https://fortjonesca.org/wp-content/uploads/2020/02/Final-FORT-JONES-General-Plan.pdf	1/1/2006
Hayfork Community Plan	Final	No	Community plan for Hayfork. Includes land use designations for resources and open spaces.	https://www.trinitycounty.org/node/1901	11/19/1996
Junction City Community Plan	Final	No	Community plan for Junction City. Includes land use designations for timberland preserves and open spaces.	https://www.trinitycounty.org/node/1901	7/1/1987
Lewiston Community Plan	Final	No	Community plan for Lewiston. Includes land use designations for open spaces and resource lands.	https://www.trinitycounty.org/node/1901	9/16/1986

Title	Status	Spatial Data	Reference Purpose	Link	Date
City of Redding General Plan	Updated periodically	Yes	General plan for Redding. Includes a general goal to improve water quality in city limits and restore native habitats with an emphasis on wetlands and riparian habitat. Includes a land use designation of greenway, which is equivalent to open space.	https://www.cityofredding.org/departments/development-services/planning/general-plan-and-development-guidelines	9/1/2019 (last amended)
City of Shasta Lake General Plan	In progress	Yes	General plan for Shasta Lake. Requires variable setbacks and riparian/wetland buffers for new development. There are currently no land use designations for conservation.	https://planshastalake.com/	2/1/2022
Weaverville Community Plan	Final	No	Community plan for Weaverville. Includes a land use designation of open space/federal.	https://www.trinitycounty.org/node/1901	12/11/2001 (last revised)
City of Yreka General Plan Update 2002–2022	Updated periodically	Yes	General plan for Yreka. Includes one land use designation that is collectively for recreation, school, and conservation and open space.	http://ci.yreka.ca.us/164/Planning	5/1/2014 (last updated)
Other Conservation and Management Documents	See below	See below	See below	See below	See below
California EcoAtlas	Updated periodically (nearly daily)	Yes	Statewide database tracking the extent and condition of wetlands in California, managed by the San Francisco Estuary Institute.	https://www.ecoatlas.org/	10/9/2020
Demonstrating the California Wetland Status and Trends Program: A Probabilistic Approach for Estimating Statewide Aquatic Resource Extent, Distribution and Change Over Time	Final	No	A report from the Southern California Coastal Water Research Project describing a pilot study that is tracking wetland conditions statewide.	https://www.sccwrp.org/publications/	4/1/2015
Sacramento River Watershed Program	Updated periodically (nearly continuously)	Yes	An organization that conducts numerous restoration programs, and creates numerous restoration documents, in the Sacramento River hydrologic unit code four-digit (“HUC-4”) (1802). These documents include watershed assessments, management plans, and specific study reports.	https://sacriver.org/	Updated nearly continuously
Smith River Plain Stream Restoration Plan Del Norte County	Yes	No	The Smith River Alliances’ restoration plan for the Smith River. The document was funded in part by the CCC.	https://smithriveralliance.org/library/	10/1/2018

[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 the chapter by describing the advance mitigation credits already held by District 2.

4.1 SHOPP Advance Mitigation Credits

The 2016 SHOPP, with California Transportation Commission approval, released the first funds used to program Caltrans advance mitigation projects in several Caltrans Districts. The projects were programmed against the $40 million reserve created in the 2016 SHOPP for advance mitigation project delivery. Thirteen pilot advance mitigation projects were programmed in the SHOPP and their delivery is underway. One such project may inform Caltrans District 2's advance mitigation planning:

- 02-1H640: National Fish and Wildlife Foundation ("NFWF") Sacramento District California In-lieu Fee Program pre-permit aquatic resource credit purchases.

This advance mitigation project consisted of aquatic resources pre-permit credit purchases from the NFWF Sacramento District California In-Lieu Fee Program for three service areas that overlap the GAI (Table 4-1). With natural resource regulatory agency approval, SHOPP transportation projects have begun to use these bulk credits to satisfy specific transportation project permit conditions; however, not all have been applied to a transportation project yet and some are still available.

Table 4-1. SHOPP Advance Mitigation Credits

Name	Year Approved	Signatories[a]	Service Area	Credit Types
NFWF Sacramento District California In-lieu Fee Program	2014	**Corps, EPA, NMFS, SWRCB**	Northeast Sacramento River,[b] Northwest Sacramento River,[c] and Pit River[d]	Aquatic resource credits: 0.67 Northeast Sacramento River, 0.78 Northwest Sacramento River, 0.99 Pit River.

[a] Signatories in **bold** are signatories to the *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation* (Caltrans et al. 2020).
[b] The Northeast Sacramento River aquatic resource service area consists of the following HUC-8s present in the GAI: 18020151, 18020152, 18020154.
[c] The Northwest Sacramento River aquatic resource service area consists of the following HUC-8 present in the GAI: 18020151.
[d] The Pit River service area consists of the following HUC-8s present in the GAI: 18020003, 18020004, 18020005.

4.2 HCPs and NCCPs

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

When Caltrans is not an NCCP permittee, under specific conditions and with signatory agency approval, Caltrans may be able to qualify as a Participating Special Entity under the plan, gaining some of the NCCP permittee's privileges; however, not all NCCPs have a Participating Special Entity clause.

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

4.3 Conservation and Mitigation Banks

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

Caltrans identified 15 active or pending conservation and/or mitigation banks with service areas that overlap all or part of the GAI. Information on the agency approvals, the types of credits available, and brief descriptions of each bank are provided in Table 4-2, and the location and extent of their service areas are depicted on Figures 4-1 through 4-6. 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 4-2.

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

Table 4-2. Overview of Conservation and Mitigation Banks in the GAI[a]

Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Credit Types
Big Gun Conservation Bank	2010	Active – credits available	**FWS**	47.81	California red-legged frog
Blackburn Vernal Pool Conservation Bank	2007	Active – credits available	**FWS**	631	Vernal pool fairy shrimp
Bullock Bend Mitigation Bank	2016	Active – credits not available[c]	**FWS, CDFW, Corps, EPA, NMFS**	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
Daley Ranch Vernal Pool Conservation Bank	2007	Active – credits available	**FWS**	665	Vernal pool preservation
Fremont Landing Conservation Bank	2006	Active – credits available	**NMFS**	100	Riparian forest floodplain
Hamilton Ranch Conservation Bank	2019	Active – credits available	**FWS**	393.7	Vernal pool fairy shrimp, vernal pool tadpole shrimp, Conservancy fairy shrimp, Hoover's spurge, slender Orcutt grass
Meridian Ranch Mitigation Bank	2013	Active – credits not available[c]	**FWS, CDFW, Corps, EPA**	377.63	Swainson's hawk foraging habitat preservation, vernal pool establishment and vernal pool preservation (includes vernal pool fairy shrimp and vernal pool tadpole shrimp)
Nicolaus Ranch VELB Conservation Bank	2016	Active – credits available	**FWS**	42	Valley elderberry longhorn beetle
North Bay Highlands Conservation Bank	2014	Active – credits available	**FWS**	609	California red-legged frog
Ohlone West Conservation Bank	2005	Active – credits available	**FWS, CDFW**	640	California tiger salamander, California red-legged frog, Alameda whipsnake, Callippe silverspot butterfly

Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Credit Types
Oursan Ridge Conservation Bank	2017	Active – credits available	**FWS, CDFW**	430	California red-legged frog, Alameda whipsnake
Porter Ranch Mitigation Bank	2013	Approved, pending bank construction; credits not available	**FWS, Corps, EPA**	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**	745	California red-legged frog, Callippe silverspot butterfly
Stillwater Plains Mitigation Bank	2000	Active – credits available	**FWS, CDFW, Corps, EPA**	834	Valley elderberry longhorn beetle, Boggs Lake hedge-hyssop, vernal pool creation, vernal pool preservation, vernal swale, emergent marsh, constructed channel, oak woodland

[a] Up-to-date information on approved conservation and mitigation banks, including available credits, can be found at the following websites:
https://www.wildlife.ca.gov/Conservation/Planning/Banking/Approved-Banks
https://ribits.ops.usace.army.mil/ords/f?p=107:2::::::
https://www.fws.gov/sacramento/es/Conservation-Banking/Banks/In-Area/
[b] Signatories in **bold** are signatories to the *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation* (Caltrans et al. 2020).
[c] Credits at this bank are reserved and sold out (L. Shively, Corps, personal communication, 2022). Hence, they are not available for the purposes of this RAMNA or for planning.

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

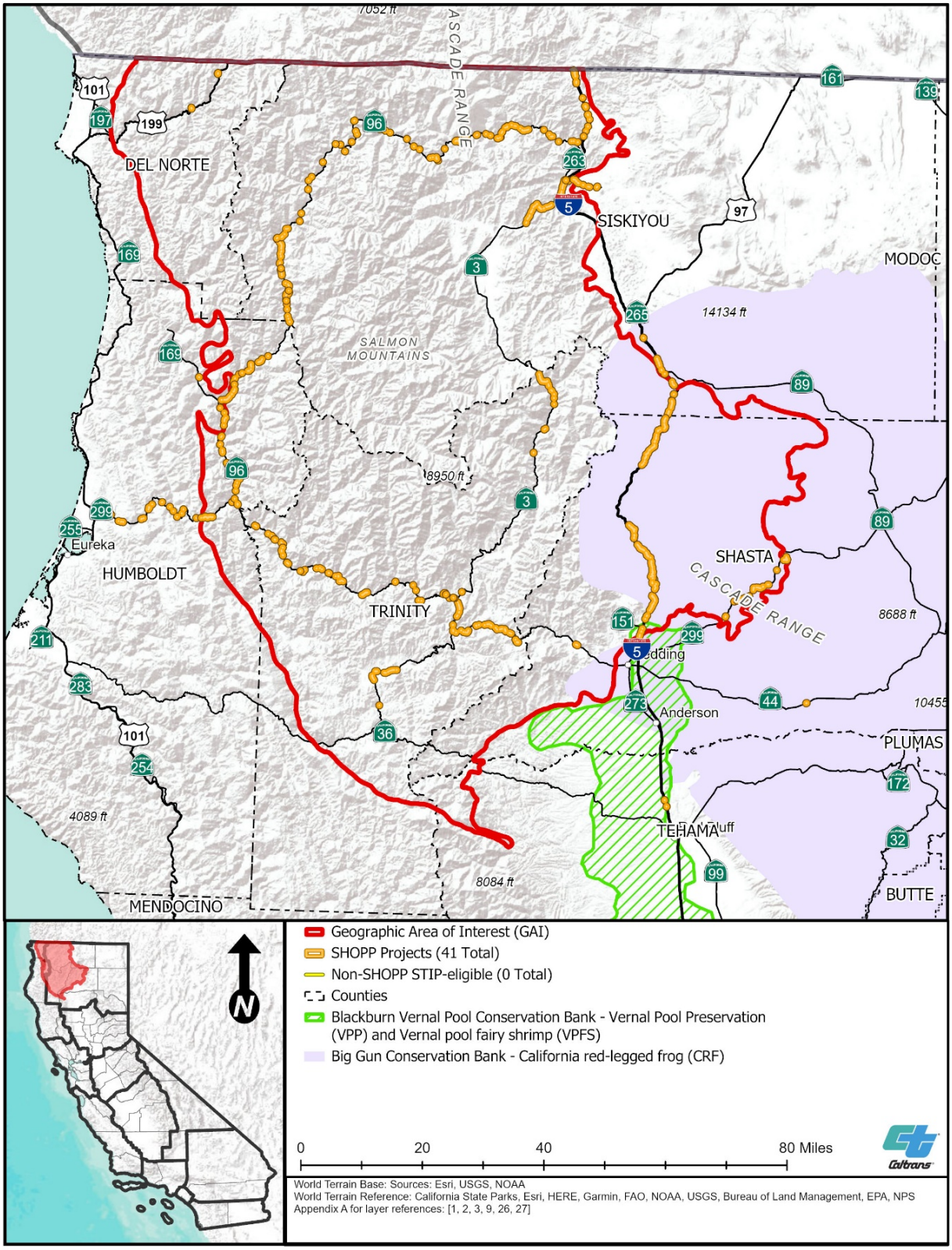


Figure 4-2. Conservation and Mitigation Bank Service Areas – Part 2

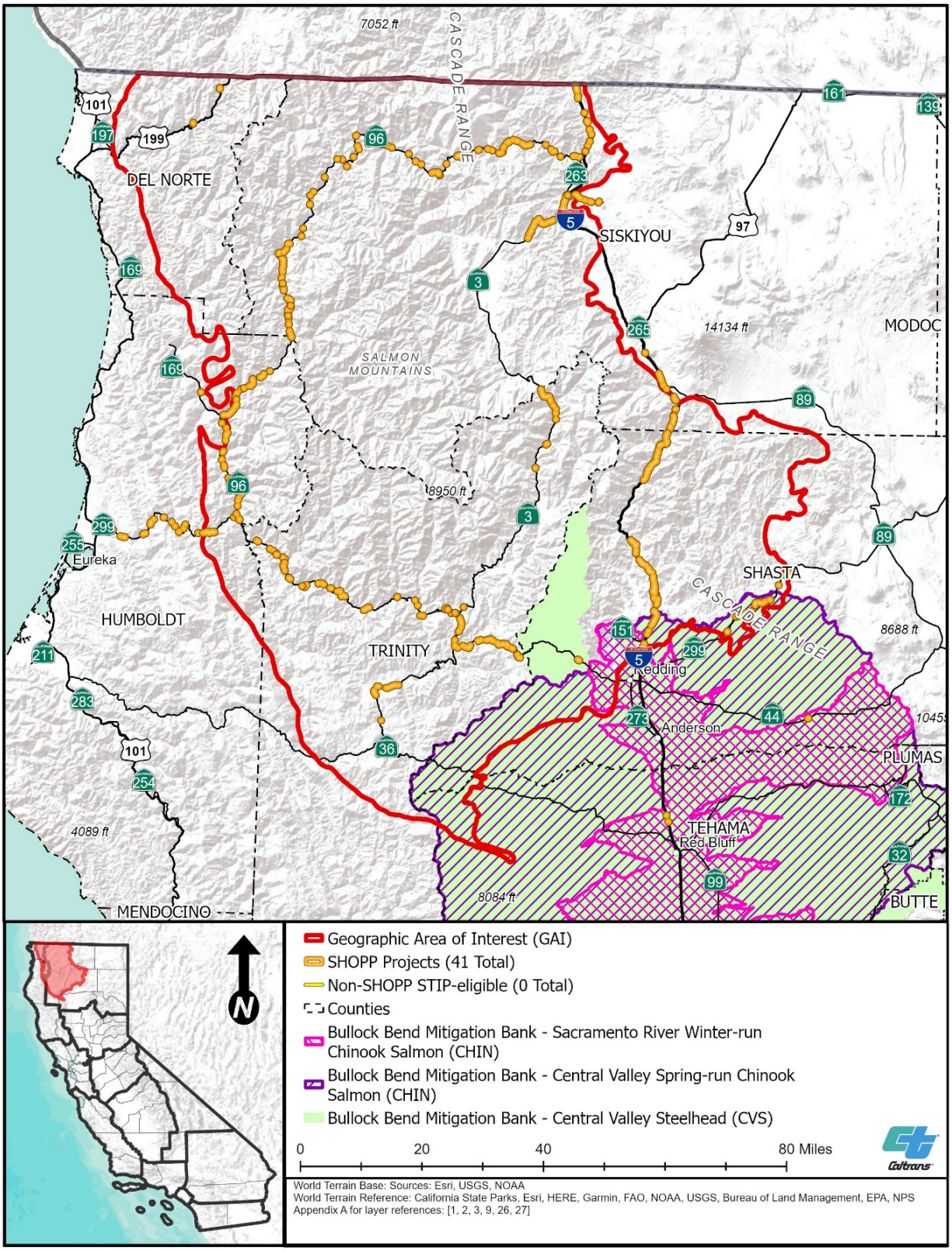


Figure 4-3. Conservation and Mitigation Bank Service Areas – Part 3

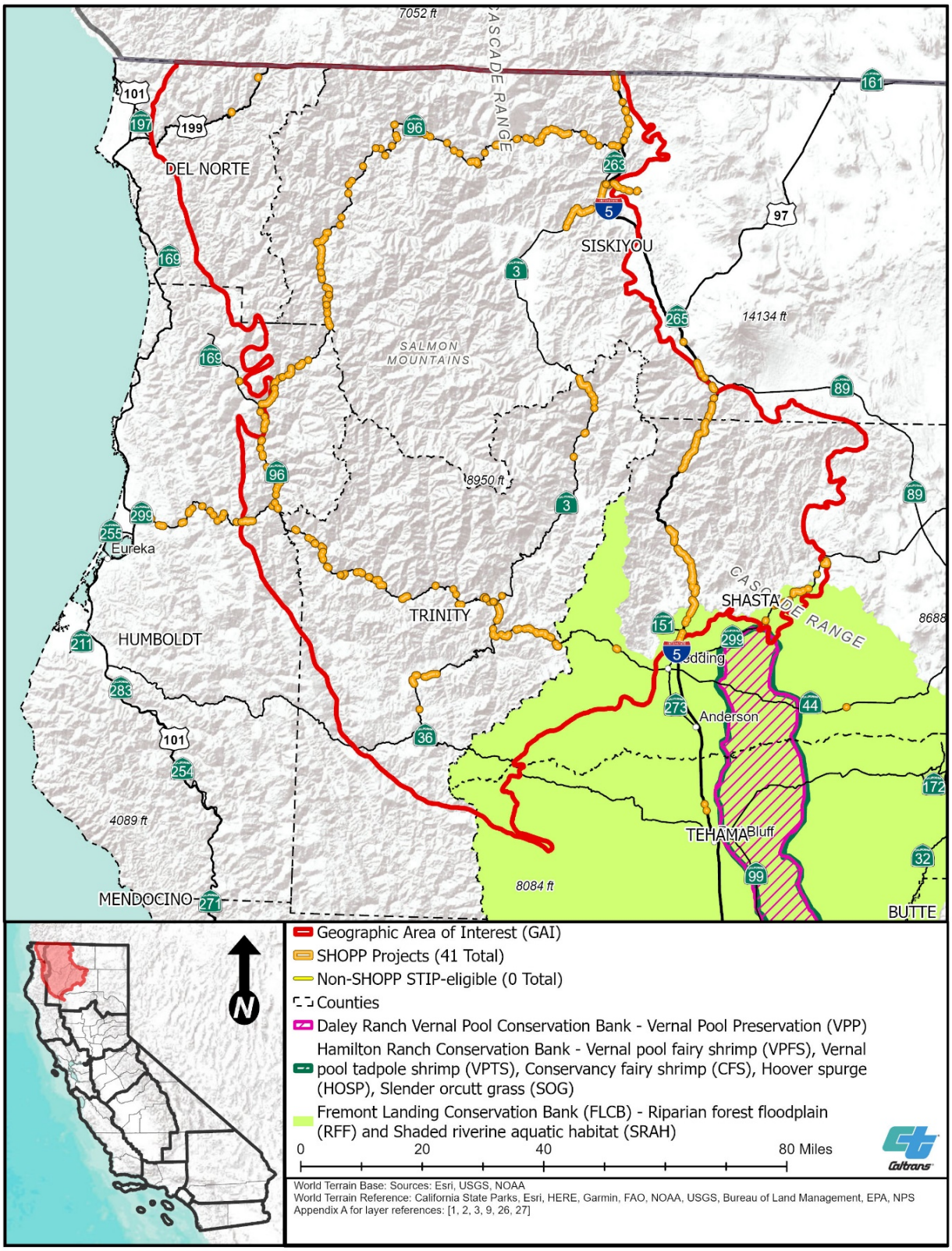


Figure 4-4. Conservation and Mitigation Bank Service Areas – Part 4

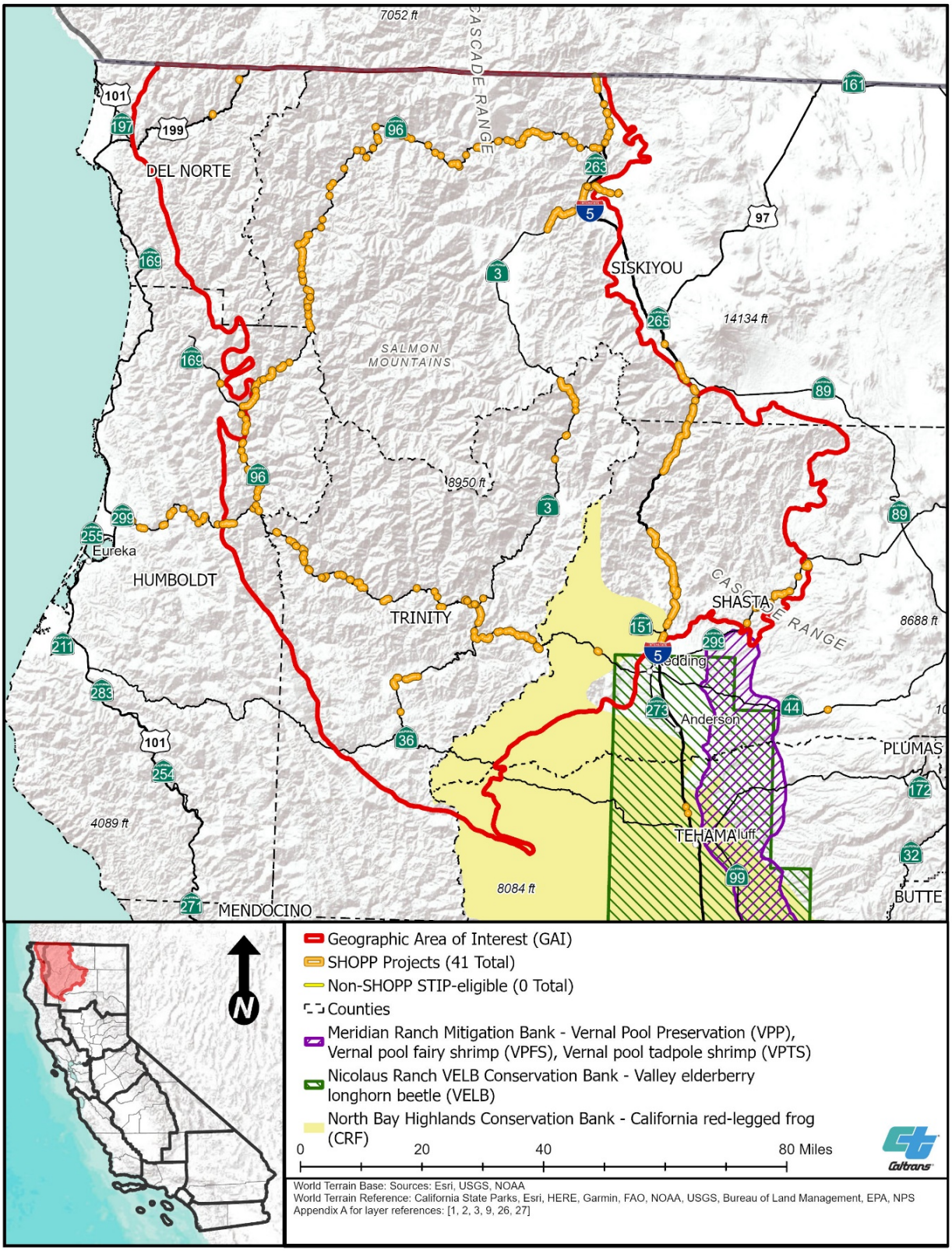


Figure 4-5. Conservation and Mitigation Bank Service Areas – Part 5

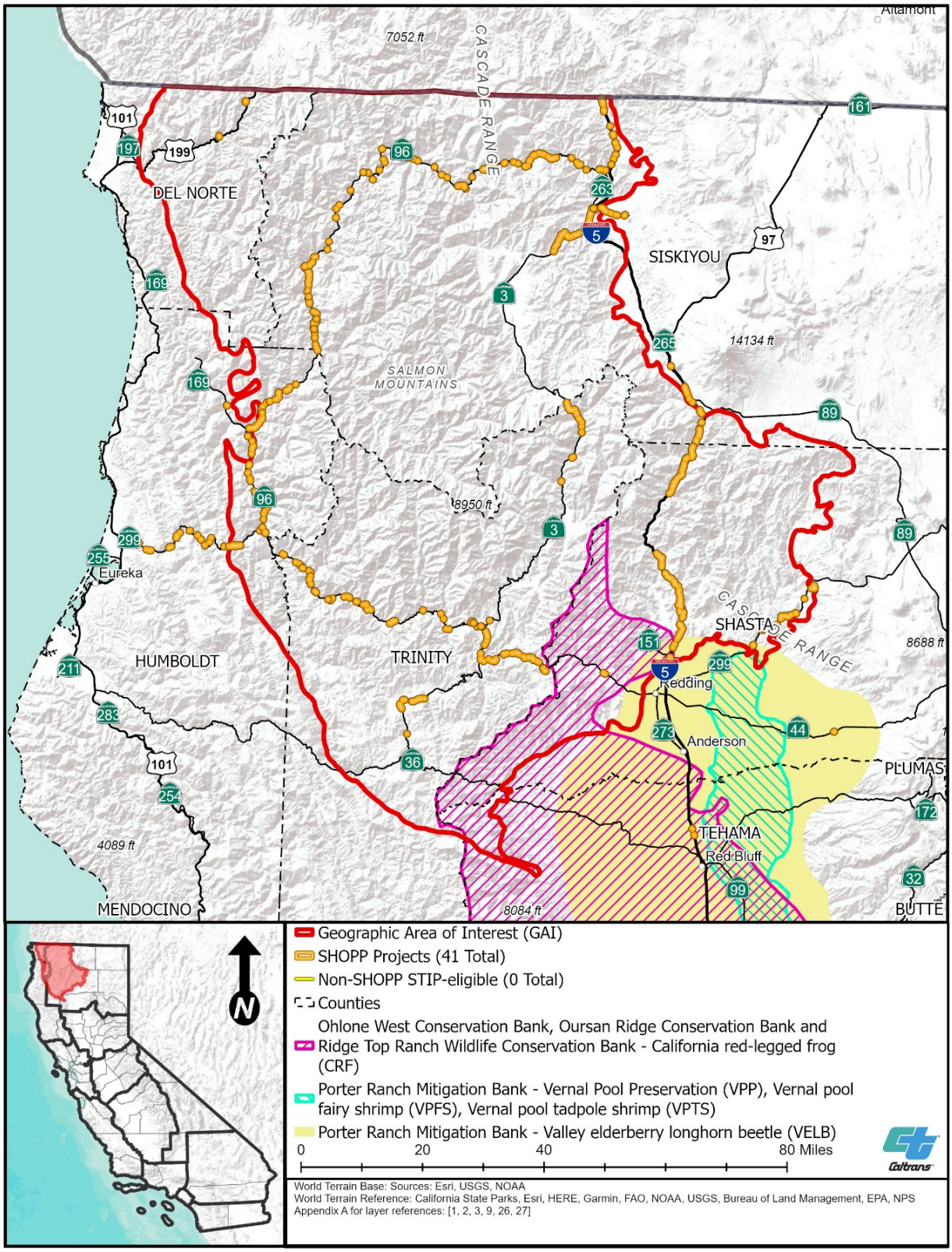
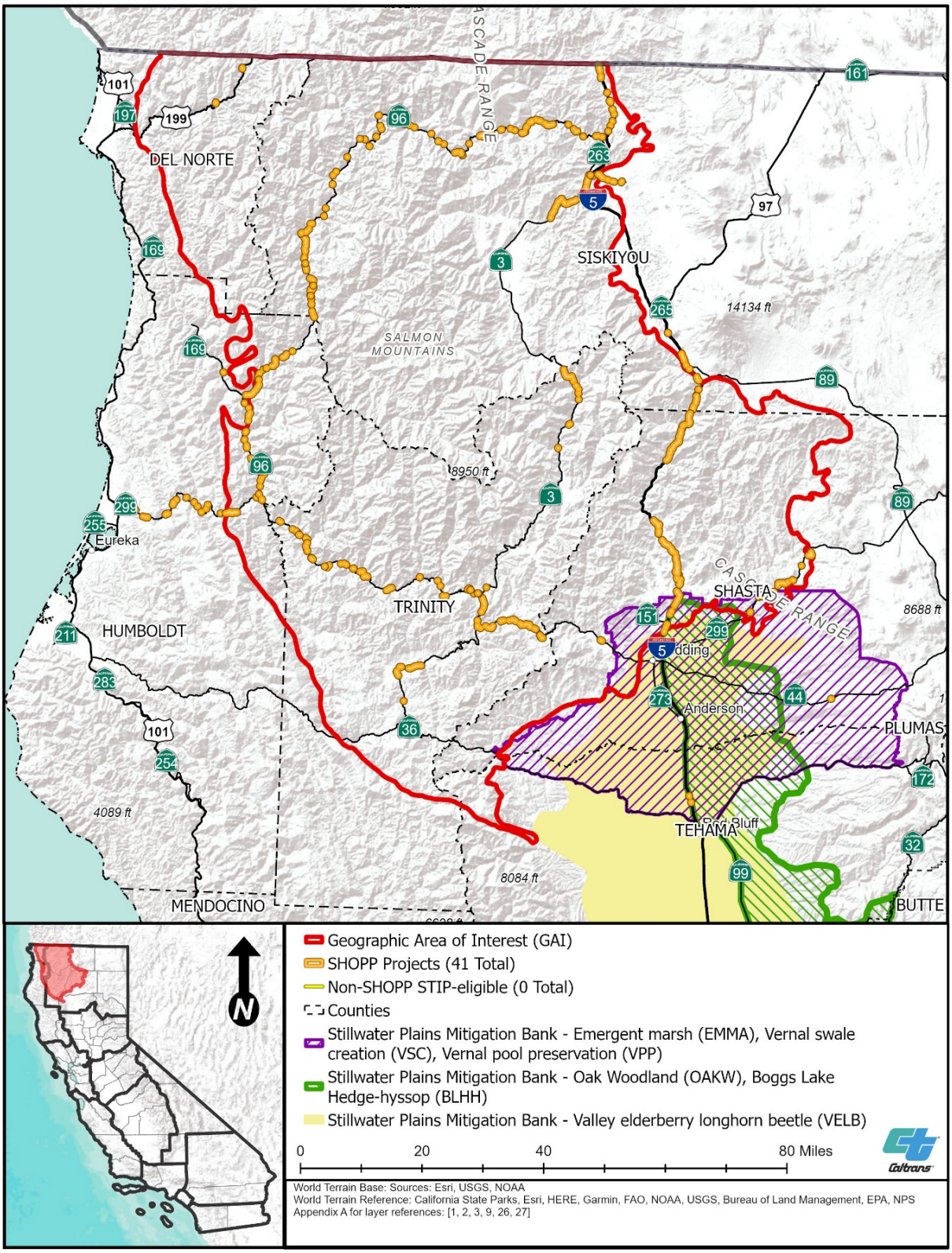


Figure 4-6. Conservation and Mitigation Bank Service Areas – Part 6



In addition to the conservation and mitigation banks listed in Table 4-2, credits may still be available from the Caltrans historical banks and mitigation sites: the Jelly's Ferry Mitigation Bank, Honey Lake Wetland Mitigation Bank, Toomes Creek Mitigation Bank, Fish Gulch Habitat Mitigation Area, and Beaver Creek Fish Habitat Mitigation Area. If available, these existing opportunities will inform how District 2 prioritizes its need for compensatory mitigation credits. Caltrans District 2 will consider these opportunities as it develops advance mitigation project concepts.

4.4 In-lieu Fee Programs

Compensatory mitigation can also be accomplished through participation in an in-lieu fee program, which is an agreement between a natural resource regulatory agency or agencies and a single in-lieu fee sponsor. In-lieu fee mitigation occurs when a permittee provides funds to an in-lieu fee sponsor instead of either completing permittee-responsible mitigation or purchasing credits from a conservation or mitigation bank. An in-lieu fee sponsor can include entities such as public agencies or nonprofit organizations, and the fees are used to plan, build, and maintain a mitigation site. This method is similar to purchasing mitigation credits, in that the mitigation is usually conducted "off site." Often, the mitigation occurs after the permitted impacts. However, when the instrument allows for pre-transfer credit purchases, credits can be purchased prior to permitted impacts.

One active in-lieu fee program has a service area that overlaps the GAI: the NFWF Sacramento District California ILF Program (Table 4-3, Figures 4-7 and 4-8). The Northeast Sacramento River, Northwest Sacramento River, and Pit River service areas overlap the GAI (Figure 4-7). See discussion in Section 4.1. The Northwest Sacramento Valley and other vernal pool service areas are indicated on Figure 4-8.

Table 4-3. Overview of In-lieu Fee Programs in the GAI[a]

Name	Year Approved	Signatories[b]	Instrument Includes Pre-transfer Credit Purchases?	Location	Credit Types
NFWF Sacramento District California ILF Program	2014	**Corps, EPA, NMFS, RWQCB,** NFWF	Yes	Corps Sacramento District Boundary (entire)	▪ Aquatic resource ▪ Vernal pool

[a] Up-to-date information on approved in-lieu fee programs, including available credits, can be found at: https://ribits.ops.usace.army.mil/ords/f?p=107:47:13453394859366::NO
[b] Signatories in **bold** are signatories to the *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation* (Caltrans et al. 2020).

Figure 4-7. In-lieu Fee Programs – Part 1

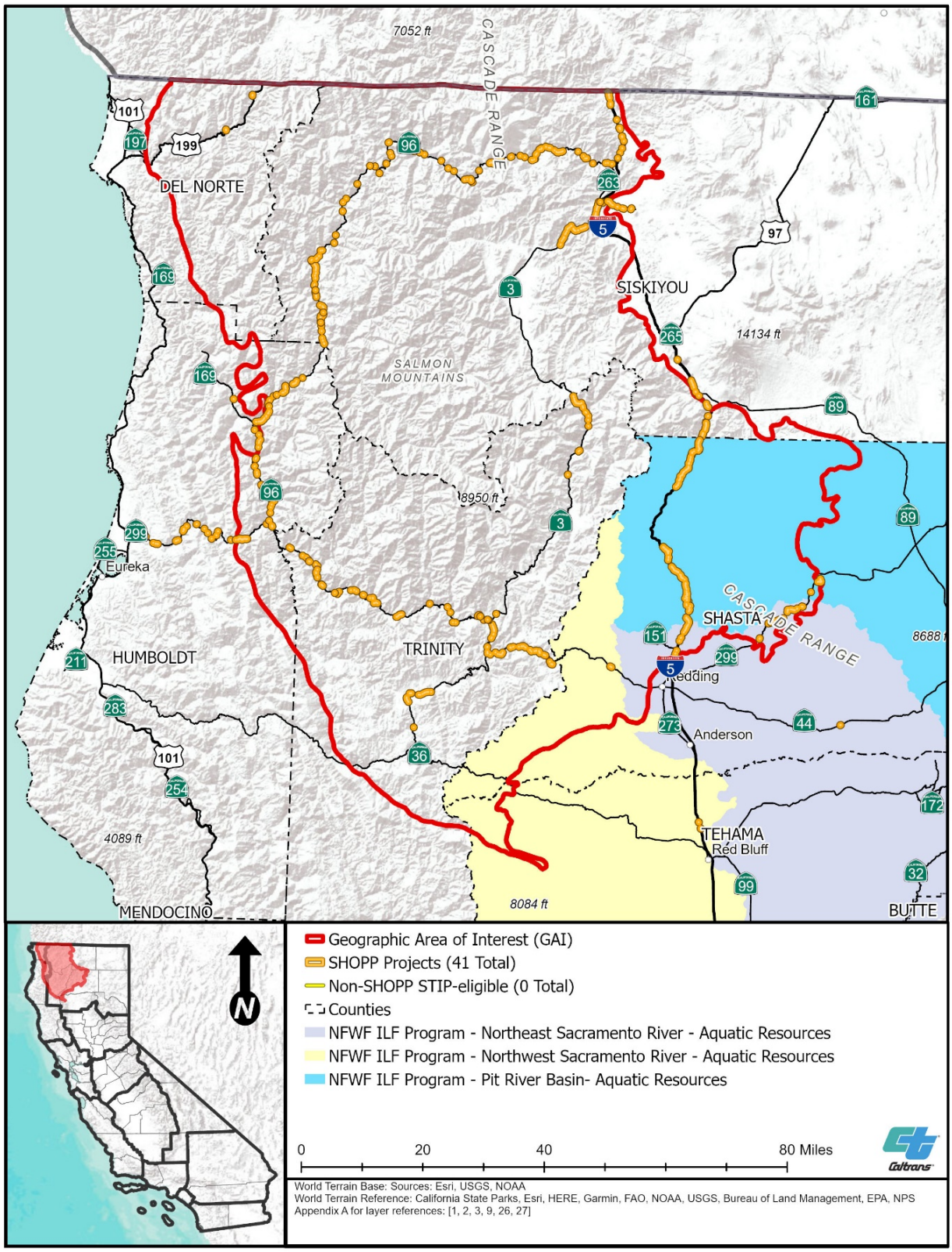
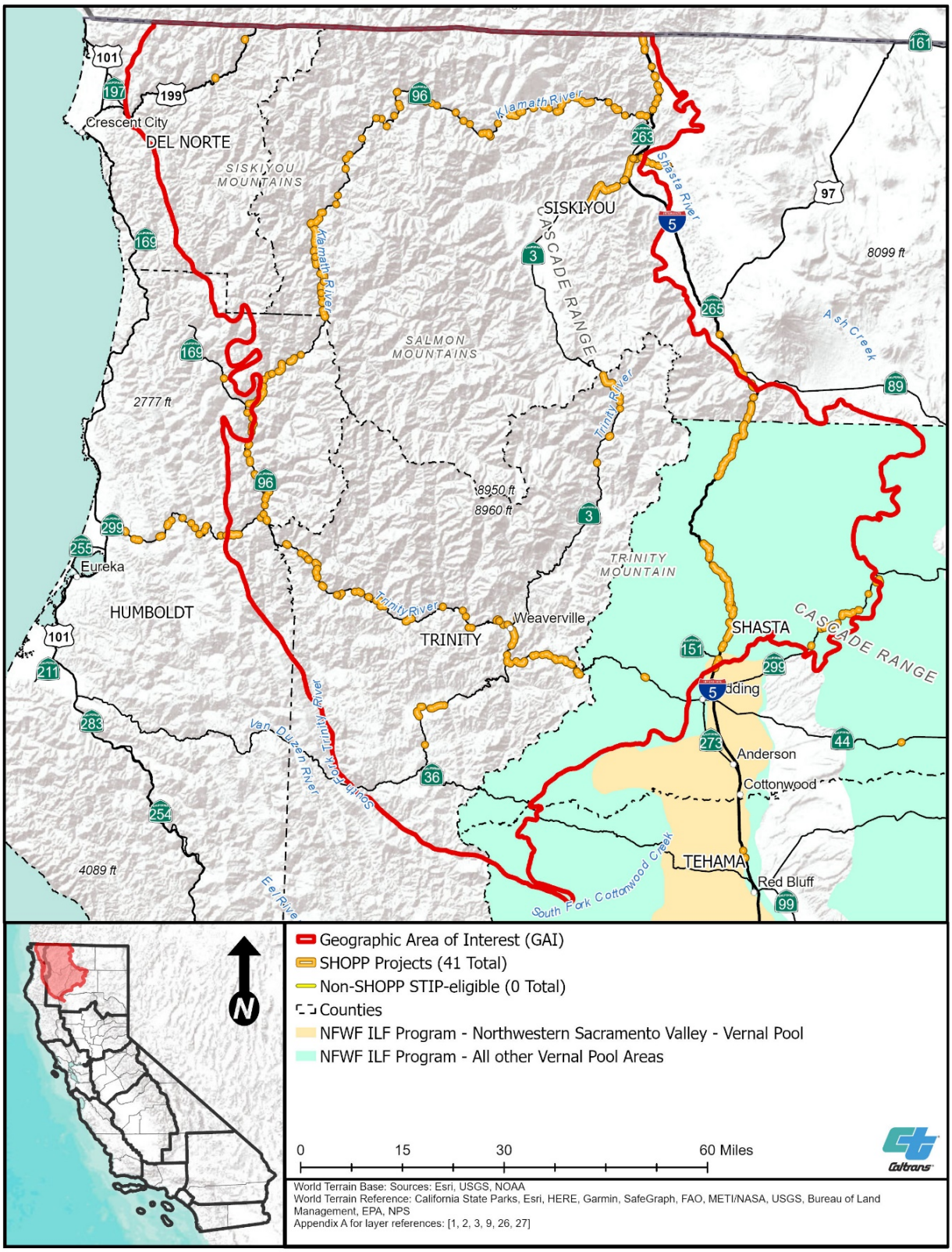


Figure 4-8. In-lieu Fee Programs – Part 2



4.5 RCISs and MCAs

In 2016, Assembly Bill 2087 established CDFW's RCIS Program (FGC Chapter 9, § 1850 et seq.), which created a voluntary framework for governments and other entities to strategically plan for conservation investments in their areas, including investments performed for compensatory mitigation. To promote the conservation quality of compensatory mitigation investments, the RCIS Program provides an advance mitigation tool that can be applied to resources subject to regulations implemented by CDFW. MCAs are developed when and where CDFW approves an RCIS and, with respect to the SHS, create credits that may be used as compensatory mitigation to offset impacts identified under CESA and the Lake and Streambed Alteration Program. It is important to note that MCAs are not permits like HCPs and NCCPs (Section 4.2). MCA advance mitigation credits are analogous to conservation and mitigation bank credits (Section 4.3). In other words, unlike an HCP and NCCP, RCISs and MCAs do not result in the issuance of incidental take permits for covered activities.

Some conservation or enhancement actions, because of their size, type, or location, would not be suitable for establishing mitigation credits through CDFW's mitigation and conservation banking program. Implementing actions on public land—such as installing wildlife crossings or removing fish passage barriers—are examples of potential enhancement actions that may establish CDFW-approved credits under an MCA and not a BEI (CDFW 2021b).

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

4.5.1. Wildlife Crossing and Aquatic Corridor Enhancements

One potential benefit of the RCIS and MCA process is that it may provide a mechanism to generate compensatory mitigation credits by improving permeability of the SHS through wildlife crossings and aquatic corridor enhancements. Through an MCA developed under an RCIS, CDFW would be authorized to recognize CESA and Lake and Streambed Alteration credits established through wildlife crossing and aquatic corridor construction made separate from and distinct from a specific transportation project. Connectivity information for the GAI is summarized in Section 2.10.

5. MODELED ESTIMATED IMPACTS

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

In this chapter, Caltrans:

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

Because Caltrans District 2 chose to focus the analysis on terrestrial resources (Section 1.6), the results presented below are organized by the Klamath Mountains Ecoregion Section within Districts 1 and 2, which is also the GAI.

5.1 Approach

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

- SHOPP transportation project needs are forecast quantitatively through the SAMNA model developed for the AMP.
- STIP-eligible needs are assessed qualitatively, through Caltrans District 2, MPO, RTPA, and other transportation agency coordination.

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

5.1.1. SHOPP Needs Assessment: SAMNA Model Results

SHOPP impacts were forecast through the SAMNA. The SAMNA consists of an intersection of assumed transportation project footprints with natural resource layers developed for the SAMNA. Briefly described in Section 1.5, more detailed SAMNA

information is provided in the *Advanced Mitigation Needs Assessment GIS Tool Report for California Department of Transportation* (Caltrans 2018a).

To identify the list of SHOPP projects planned for the GAI, Caltrans consulted the SHOPP Ten-Year Book for fiscal years 2021/22 to 2030/31 (Caltrans 2021a). The intent of the SHOPP Ten-Year Book is to raise awareness of planned future transportation projects, and detailed transportation project information is not provided. The SHOPP Ten-Year Book includes 41 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 41 planned transportation projects are shown on most of the maps in this document.

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

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

5.1.2. Non-SHOPP STIP-eligible Needs Assessment

At this time, STIP-eligible needs are assessed qualitatively, through coordination between the District, MPOs, RTPAs, and other public agencies that implement transportation improvements. Obtaining a reliable list of STIP transportation projects within the 10-year planning horizon is problematic. It is never known which transportation projects will be funded through the STIP until the funds are voted on by the California Transportation Commission, at which point the transportation projects are well past their planning and conceptualization phases and entering their delivery phases.

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

To address the dynamic nature of the non-SHOPP STIP-eligible list, it was necessary to identify transportation projects that will be (1) reasonably certain to occur in the same 10-year time frame as the SHOPP projects used in the SAMNA and (2) highly likely to receive STIP funding. To that end, the AMP consulted the Caltrans Division of Transportation Planning's Multimodal Operations, Non-SHOPP, Transportation Equity Report database, using the criteria that a transportation project would have to be in a fiscally constrained[1] regional transportation plan, with a Ready to List[2] year identified as occurring in the 10-year planning horizon. The list would be further refined through consultation with the Caltrans Districts and their regional and local transportation partners (see Table 1-3 of this document for the consultation summary). However, no planned STIP-eligible transportation projects were identified within the GAI for fiscal years 2021/22 to 2030/31.

Non-SHOPP STIP-eligible Potential Impacts

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

5.2 Estimated Wildlife Impacts

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

Below, estimated impacts are presented for the ecoregion sections that overlap the GAI for species of mitigation need identified by Caltrans District 2, as well as for species that may co-occur in their habitats. The complete results of the SAMNA—inclusive of the 41 transportation projects planned in the GAI and listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*, that may affect special-status plant and wildlife species—are provided in Appendix D, *Complete SAMNA Species Results*.

The special-status terrestrial plant and wildlife species evaluated through the SAMNA consisted of federal and state threatened, endangered, or sensitive species; state fully protected or rare species; or state species of special concern. Based on a search of the species-attributed vegetation layer, 66 special-status terrestrial species have the potential to occur in the GAI (Section 2.7, Appendix D; Caltrans 2021a). Using the methods described in Section 5.1.1, the SAMNA analysis determined that 41 SHOPP transportation projects could potentially affect 21 habitat types, which could support up to 54 special-status species (Table 5-1).

[1] Transportation project funding is reasonably assured.
[2] Transportation project schedule is reasonably assured. Ready to List is a named milestone within the Caltrans project delivery process. It is the point when a complete package is ready for contractors to bid on and a transportation project has been approved to be advertised to bid for construction.

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

Ecoregion Section	Number of Caltrans SHOPP Projects[a]	Number of Habitats	Special-status Species[b,c]	Estimated Total Habitat Impact (acres)[d]
Klamath Mountains	41	25	54	94.1

[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 2021b).
[d] Excludes urban

Caltrans identified species of mitigation need from the suite of special-status species anticipated to inhabit the GAI. Species of mitigation need are species for whom a high probability of compensatory mitigation need is anticipated. The species of mitigation need, identified in Section 1.6, were included in the analysis, and each is discussed briefly in the subsections below: foothill yellow-legged frog, Shasta salamander[3], and fisher. Although the estimated special-status wildlife impacts provided are focused on the compensatory mitigation needs identified by Caltrans District 2, consideration was also given to the other species that the SAMNA model indicates may use the same habitat as the species of mitigation need.

5.2.1. Foothill Yellow-legged Frog

Using the methods described in Section 5.1.1, impacts on foothill yellow-legged frog and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 55.8 acres of foothill yellow-legged frog habitat may be affected by 38 Caltrans SHOPP projects planned in the GAI (Caltrans 2021a). Results are summarized in Table 5-2.

5.2.2. Shasta Salamander

Using the methods described in Section 5.1.1, impacts on Shasta salamander and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 4.4 acres of Shasta salamander habitat may be affected by 5 Caltrans SHOPP projects in the GAI (Caltrans 2021a). Results are summarized in Table 5-2.

5.2.3. Fisher

Using the methods described in Section 5.1.1, impacts on fisher and its habitat were estimated for the transportation projects that may affect wildlife (Appendix B). The SAMNA estimated that 23.9 acres of fisher habitat may be affected by 29 Caltrans

[3] The SAMNA model's foundational information predates the separation of Shasta salamander into a complex with three subspecies. Therefore, reported Shasta salamander impacts could refer to either Shasta salamander or Samwel salamander, or both.

SHOPP transportation projects planned in the GAI (Caltrans 2021a). Results are summarized in Table 5-2.

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

Ecoregion Section	Foothill Yellow-legged Frog: Number of Caltrans SHOPP Projects[a]	Foothill Yellow-legged Frog: Estimated Habitat Impact (acres)[b]	Shasta Salamander: Number of Caltrans SHOPP Projects[a]	Shasta Salamander: Estimated Habitat Impact (acres)[b]	Fisher: Number of Caltrans SHOPP Projects[a]	Fisher: Estimated Habitat Impact (acres)[b]	Total
Klamath Mountains	38	55.8	5	4.4	29	23.9	55.9

[a] Transportation projects are listed in Appendix B.
[b] Excludes urban

5.2.4. Other Special-status Species

The above-listed species of mitigation need co-occur with other protected plant, amphibian, bird, and mammal species in the Klamath Mountains Ecoregion Section in 20 habitats. Using the methods described in Section 5.1.1, the SAMNA forecasts impacts on an additional 50 special-status terrestrial species that potentially use the same habitats as at least one of the species of mitigation need in the Klamath Mountains Ecoregion Section (Table 5-3).

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Table 5-3. Estimated SHOPP Impacts on Co-occurring Terrestrial Special-status Species: Klamath Mountains Ecoregion Section (acres) in the GAI

Common Name	Scientific Name	Status	Annual Grass	Blue Oak Woodland	Blue Oak-Foothill Pine	Closed-Cone Pine-Cypress	Coastal Oak Woodland	Douglas-Fir	Jeffrey Pine	Klamath Mixed Conifer	Mixed Chaparral	Montane Chaparral	Montane Hardwood	Montane Hardwood-Conifer	Montane Riparian	Ponderosa Pine	Riverine	Sierran Mixed Conifer	Valley Foothill Riparian	Valley Oak Woodland	Wet Meadow	White Fir
Not applicable	Not applicable	**Total**	**10.03**	**0.15**	**0.40**	**0.02**	**0.47**	**4.62**	**0.45**	**2.00**	**5.92**	**0.68**	**11.79**	**5.93**	**2.53**	**1.84**	**1.44**	**7.38**	**0.37**	**0.01**	**0.13**	**0.04**
Species of Mitigation Need	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Foothill yellow-legged frog	*Rana boylii*	FS, SE, SSC	10.03	0.15	0.40	0.02	0.47	4.62	0.00	2.00	5.92	0.68	11.79	5.93	2.53	1.84	1.44	7.38	0.37	0.01	0.13	0.04
Shasta salamander	*Hydromantes shastae*	FS, ST	0.00	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.27	0.00	2.74	0.00	0.00	0.00	0.00
Fisher	*Pekania pennanti*	FS, SSC	0.00	0.00	0.00	0.00	0.00	4.62	0.17	2.00	0.00	0.00	0.00	5.83	2.53	1.51	0.00	7.21	0.00	0.00	0.00	0.04
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Ashland thistle	*Cirsium ciliolatum*	SE	9.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	10.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Bensoniella	*Bensoniella oregona*	FS, SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.90	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00
Gentner's fritillary	*Fritillaria gentneri*	FE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.77	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Indian Valley brodiaea	*Brodiaea rosea*	FS, SE	9.56	0.00	0.00	0.02	0.00	0.00	0.00	0.00	5.55	0.00	10.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
McDonald's rockcress	*Arabis mcdonaldiana*	FE, SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.97	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Siskiyou mariposa lily	*Calochortus persistens*	FS, SR	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.55	0.00	0.00	0.00	0.00	0.00	0.00	7.38	0.00	0.00	0.00	0.00
Trinity buckwheat	*Eriogonum alpinum*	FS, SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Yreka phlox	*Phlox hirsuta*	FE, SE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
California red-legged frog	*Rana draytonii*	FT, SSC	0.10	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.57	0.14	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.00
Cascades frog	*Rana cascadae*	FS, SCE, SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.68	0.00	0.00	0.00	0.00
Coastal tailed frog	*Ascaphus truei*	SSC	0.00	0.00	0.00	0.00	0.00	4.62	0.08	2.00	0.00	0.00	0.00	5.83	2.53	1.51	1.44	0.00	0.00	0.00	0.00	0.04

Common Name	Scientific Name	Status	Annual Grass	Blue Oak Woodland	Blue Oak-Foothill Pine	Closed-Cone Pine-Cypress	Coastal Oak Woodland	Douglas-Fir	Jeffrey Pine	Klamath Mixed Conifer	Mixed Chaparral	Montane Chaparral	Montane Hardwood	Montane Hardwood-Conifer	Montane Riparian	Ponderosa Pine	Riverine	Sierran Mixed Conifer	Valley Foothill Riparian	Valley Oak Woodland	Wet Meadow	White Fir
Southern torrent salamander	*Rhyacotriton variegatus*	FS, SSC	0.00	0.00	0.00	0.00	0.00	3.16	0.00	1.65	0.00	0.00	0.00	3.21	2.09	0.00	0.00	0.05	0.00	0.00	0.00	0.04
Western spadefoot	*Spea hammondii*	FS, SSC	0.10	0.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Birds	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Bald eagle	*Haliaeetus leucocephalus*	FS, SE, SFP	10.03	0.15	0.40	0.00	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	1.44	7.38	0.37	0.01	0.13	0.04
Black swift	*Cypseloides niger*	SSC	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.15	0.05	0.56	0.00	0.01	0.00	1.10	0.37	0.00	0.00	0.00
Burrowing owl	*Athene cunicularia*	FS, SSC	1.69	0.15	0.37	0.00	0.00	0.00	0.00	0.00	4.08	0.49	0.00	0.00	0.00	1.27	0.00	0.00	0.18	0.00	0.00	0.00
California spotted owl	*Strix occidentalis occidentalis*	FS, SSC	0.00	0.00	0.04	0.00	0.00	0.82	0.00	0.00	0.00	0.00	1.82	0.08	0.00	0.08	0.00	0.01	0.00	0.00	0.00	0.00
Golden eagle	*Aquila chrysaetos*	FS, SFP, SFS	10.03	0.15	0.40	0.00	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	0.00	7.38	0.37	0.01	0.13	0.04
Grasshopper sparrow	*Ammodramus savannarum*	SSC	1.12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13	0.00
Loggerhead shrike	*Lanius ludovicianus*	SSC	0.92	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.04	0.00	0.37	0.14	0.00	0.17	0.00	0.00	0.00	0.00	0.00	0.00
Long-eared owl	*Asio otus*	SSC	10.03	0.15	0.40	0.00	0.47	0.00	0.00	2.00	5.92	0.68	11.79	5.93	2.53	1.84	0.00	7.38	0.37	0.01	0.13	0.04
Marsh wren	*Cistothorus palustris*	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern goshawk	*Accipiter gentilis*	FS, SSC, SFS	0.00	0.00	0.40	0.00	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	0.00	7.38	0.37	0.01	0.00	0.04
Northern harrier	*Circus hudsonius [cyaneus]*	SSC	1.06	0.00	0.00	0.00	0.00	1.64	0.00	0.77	0.31	0.00	1.09	0.83	1.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Northern spotted owl	*Strix occidentalis caurina*	FT, ST, SFS	0.00	0.00	0.16	0.00	0.47	3.80	0.45	2.00	0.00	0.00	7.52	5.36	2.51	0.92	0.00	7.26	0.37	0.00	0.00	0.04
Olive-sided flycatcher	*Contopus cooperi*	SSC	0.00	0.00	0.40	0.00	0.00	4.62	0.45	2.00	5.92	0.00	11.79	5.93	2.53	1.84	0.00	7.38	0.00	0.00	0.00	0.04
Peregrine falcon	*Falco peregrinus*	SFP, SFS	10.03	0.15	0.40	0.02	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	1.44	7.38	0.37	0.01	0.13	0.04

Common Name	Scientific Name	Status	Annual Grass	Blue Oak Woodland	Blue Oak-Foothill Pine	Closed-Cone Pine-Cypress	Coastal Oak Woodland	Douglas-Fir	Jeffrey Pine	Klamath Mixed Conifer	Mixed Chaparral	Montane Chaparral	Montane Hardwood	Montane Hardwood-Conifer	Montane Riparian	Ponderosa Pine	Riverine	Sierran Mixed Conifer	Valley Foothill Riparian	Valley Oak Woodland	Wet Meadow	White Fir
Purple martin	*Progne subis*	SSC	9.94	0.00	0.40	0.02	0.47	4.62	0.00	2.00	0.00	0.00	11.79	5.93	2.53	1.83	1.44	7.38	0.37	0.01	0.13	0.04
Sandhill crane	*Antigone [Grus] canadensis*	FS, ST, SFP	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Short-eared owl	*Asio flammeus*	SSC	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Vaux's swift	*Chaetura vauxi*	SSC	0.00	0.00	0.40	0.02	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	1.44	7.38	0.37	0.00	0.13	0.04
Yellow warbler	*Setophaga petechia*	SSC	0.00	0.15	0.40	0.02	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	0.00	7.38	0.37	0.01	0.00	0.04
Yellow-breasted chat	*Icteria virens*	SSC	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	2.53	0.00	0.00	0.00	0.37	0.00	0.00	0.00
Yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC	0.60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Mammals	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
American badger	*Taxidea taxus*	SSC	10.03	0.15	0.40	0.02	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	0.00	7.38	0.37	0.01	0.13	0.04
Fringed myotis	*Myotis thysanodes*	FS	10.03	0.15	0.40	0.02	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	1.44	7.38	0.37	0.01	0.00	0.04
Long-eared myotis	*Myotis evotis*	FS	0.00	0.15	0.40	0.02	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	1.44	7.38	0.37	0.01	0.13	0.04
Marten	*Martes caurina*	FS	0.00	0.00	0.00	0.00	0.00	2.96	0.45	1.23	0.00	0.00	0.00	4.97	1.50	1.81	0.00	6.74	0.00	0.00	0.00	0.04
Pallid bat	*Antrozous pallidus*	FS, SSC	10.03	0.15	0.40	0.00	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	1.44	7.38	0.37	0.01	0.13	0.04
Sierra Nevada red fox	*Vulpes vulpes necator*	FS, ST	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00
Small-footed myotis	*Myotis ciliolabrum*	FS	1.27	0.00	0.37	0.00	0.00	0.00	0.00	0.00	4.10	0.28	4.74	2.62	0.28	1.27	0.00	2.95	0.37	0.00	0.00	0.00
Snowshoe hare	*Lepus americanus*	SSC	0.00	0.00	0.00	0.00	0.00	2.31	0.45	0.35	0.00	0.00	0.00	0.00	0.76	0.00	0.00	7.34	0.00	0.00	0.00	0.00
Sonoma red tree vole	*Arborimus pomo*	SSC	0.00	0.00	0.00	0.00	0.00	2.37	0.00	1.65	0.00	0.00	0.00	2.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Spotted bat	*Euderma maculatum*	FS, SSC	0.29	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.15	0.00	1.60	0.00	0.42	0.00	2.17	0.37	0.00	0.00	0.00
Townsend's big-eared bat	*Corynorhinus townsendii*	FS, SSC	10.03	0.15	0.40	0.00	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	1.44	7.38	0.37	0.01	0.13	0.04

Common Name	Scientific Name	Status	Annual Grass	Blue Oak Woodland	Blue Oak-Foothill Pine	Closed-Cone Pine-Cypress	Coastal Oak Woodland	Douglas-Fir	Jeffrey Pine	Klamath Mixed Conifer	Mixed Chaparral	Montane Chaparral	Montane Hardwood	Montane Hardwood-Conifer	Montane Riparian	Ponderosa Pine	Riverine	Sierran Mixed Conifer	Valley Foothill Riparian	Valley Oak Woodland	Wet Meadow	White Fir
Western mastiff bat	*Eumops perotis*	FS, SSC	0.29	0.00	0.04	0.00	0.00	0.00	0.00	0.00	4.10	0.15	3.64	1.21	0.00	0.23	0.00	0.00	0.37	0.00	0.00	0.00
Western red bat	*Lasiurus blossevillii*	SSC	0.91	0.15	0.37	0.00	0.00	0.82	0.00	0.00	1.00	0.49	6.81	2.40	0.00	1.27	0.00	2.95	0.37	0.00	0.00	0.00
Wolverine	*Gulo gulo*	FS, ST, SFP	0.00	0.00	0.00	0.00	0.00	3.12	0.00	1.65	0.00	0.49	0.00	4.32	2.32	0.00	0.00	2.28	0.00	0.00	0.00	0.04
Yuma myotis	*Myotis yumanensis*	FS	10.03	0.15	0.40	0.02	0.47	4.62	0.45	2.00	5.92	0.68	11.79	5.93	2.53	1.84	1.44	7.38	0.37	0.01	0.13	0.04

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, SR = state rare, SSC = species of special concern (CDFW), ST = state threatened

5.3 Estimated Aquatic Resources Impacts

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

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

5.3.1. Estimated Impacts on Threatened and Endangered Fish Habitat

Using the methods described in Section 5.1.1, impacts on fish habitat were estimated for the 41 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 41 SHOPP transportation projects evaluated, 9 are forecast to affect 2.4 acres of threatened and endangered fish habitat. (Table 5-4; Caltrans 2021a). Specifically, 1 transportation project is anticipated to affect 0.7 acre of spring-run Chinook salmon and California Central Valley DPS steelhead habitat in the Clear Creek-Sacramento River Sub-basin, 5 transportation projects are anticipated to affect 0.9 acre of longfin smelt habitat in the Lower Klamath Sub-basin, 2 transportation projects are anticipated to affect 0.3 acre of rough sculpin habitat in the Lower Pit Sub-basin, and 1 transportation project is anticipated to affect 0.5 acre of bull trout habitat in the McCloud Sub-basin.

Table 5-4. Summary of Estimated SHOPP Impacts on Threatened and Endangered Fish Habitat in the GAI (acres)[a,b]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Bull Trout	California Central Valley DPS Steelhead	Chinook Salmon – Spring-run	Longfin Smelt	Rough Sculpin	Total[c]
Clear Creek-Sacramento River	18020154	1	0.0	0.7	0.7	0.0	0.0	**0.7**
Lower Klamath	18010209	5	0.0	0.0	0.0	0.9	0.0	**0.9**
Lower Pit	18020003	2	0.0	0.0	0.0	0.0	0.3	**0.3**
McCloud	18020004	1	0.5	0.0	0.0	0.0	0.0	**0.5**
Total	Not applicable	**9**	**0.5**	**0.7**	**0.7**	**0.9**	**0.3**	**2.4**

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

5.3.1. Estimated Impacts on Wetlands

Using the methods described in Section 5.1.1, impacts on wetlands were estimated for the 41 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 41 SHOPP transportation projects evaluated, 17 would result in impacts on 1.3 acres of wetland habitat in the GAI, including 0.1 acre of freshwater emergent wetland and 1.2 acres of freshwater forested/shrub wetland (Table 5-5; Caltrans 2021a).

Note the SAMNA's wetland layers provide output that appears similar to its terrestrial output, in that the results are provided in terms of wetland habitat. Wetland forecasts based on the SAMNA's wetland layer, however, are considered more certain than wetland habitat forecasts based on the SAMNA's terrestrial habitat layers. Therefore, the wetland estimates below are based solely on the SAMNA's wetland data layer (Caltrans 2021a).

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

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Freshwater Emergent Wetland	Freshwater Forested/ Shrub Wetland	Total[b]
Cow Creek	18020151	2	0.0	0.4	**0.4**
Lower Klamath	18010209	1	0.0	<0.1	**<0.1**
Lower Pit	18020003	1	0.0	0.1	**0.1**
Sacramento Headwaters	18020005	3	0.0	<0.1	**<0.1**
Scott	18010208	1	<0.1	0.0	**<0.1**
Shasta	18010207	2	<0.1	<0.1	**0.1**
South Fork Trinity	18010212	1	0.0	0.1	**0.1**
Trinity	18010211	3	0.0	0.2	**0.2**
Upper Klamath	18010211	3	0.1	0.3	**0.3**
Total[b,c]	Not applicable	**17**	**0.1**	**1.2**	**1.3**

[a] The SAMNA forecasts impacts on wetlands for 9 of the 17 HUC-8s in the GAI.
[b] Totals may be different on account of rounding.
[c] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect wetlands.

5.3.2. Estimated Impacts on Non-wetland Waters

Using the methods described in Section 5.1.1, impacts on non-wetland waters were estimated for the 41 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 41 SHOPP transportation projects evaluated, 33 would result in impacts on 10.1 acres of non-wetland waters in the GAI, including 0.7 acre of lake/pond habitat and 9.3 acres of stream/river habitat (Table 5-6; Caltrans 2021a).

Table 5-6. 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	Lake/ Pond	Stream/ River	Total[b]
Clear Creek-Sacramento River	18020154	2	0.7	0.1	**0.8**
Cow Creek	18020151	1	0.0	<0.1	**<0.1**
Lower Klamath	18010209	5	0.0	0.9	**0.9**
Lower Pit	18020003	2	0.0	0.3	**0.3**
McCloud	18020004	1	0.0	0.5	**0.5**
Sacramento Headwaters	18020005	5	0.0	2.5	**2.5**
Scott	18010208	2	0.0	0.2	**0.2**
Shasta	18010207	3	0.0	0.2	**0.2**
Smith	18010101	2	0.0	<0.1	**<0.1**
South Fork Trinity	18010212	1	0.0	0.1	**0.1**
Trinity	18010211	11	0.0	2.1	**2.1**
Upper Klamath	18010206	3	0.0	2.4	**2.4**
Total[b,c]	Not applicable	**33**	**0.7**	**9.3**	**10.1**

[a] The SAMNA forecasts impacts for 12 of the 17 HUC-8s in the GAI.
[b] Totals may be different on account of rounding.
[c] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect non-wetland waters.

5.3.3. Estimated Impacts on Riparian Habitat

The SAMNA does not directly estimate riparian impacts through its aquatic resource layers, but riparian impacts can be estimated by proxy using the SAMNA montane riparian and valley foothill riparian forecasts from the SAMNA's terrestrial layer. Adapting the methods described in Section 5.1.1, impacts on riparian habitat were estimated for the 41 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period.* Of the 41 SHOPP transportation projects evaluated, the SAMNA estimated that 2.9 acres of riparian habitat may be affected by 8 Caltrans SHOPP transportation projects in the GAI, including 2.5 acres of montane riparian habitat and 0.4 acre of valley foothill riparian habitat (Table 5-7; Caltrans 2021a).

Table 5-7. Summary of Estimated SHOPP Impacts on Riparian Habitat in the GAI (acres)[a]

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects	Montane Riparian	Valley Foothill Riparian	Total[b, c]
Lower Klamath	18010209	3	0.7	0.0	**0.7**
Sacramento Headwaters	18020005	2	0.0	0.4	**0.4**
Salmon	18010210	1	0.2	0.0	**0.2**
Scott	18010208	1	<0.1	0.0	**<0.1**
Trinity	18010211	3	1.4	0.0	**1.4**
Upper Klamath	18010209	1	0.2	0.0	**0.2**
Total[c,d]	Not applicable	**8**	**2.5**	**0.4**	**2.9**

[a] The SAMNA forecasts impacts for 6 of the 17 HUCs in the GAI.
[b] The sum of montane riparian and valley foothill riparian habitat impacts is provided.
[c] Totals may be different on account of rounding.
[d] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one sub-basin; many are not forecast to affect riparian habitat.

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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.

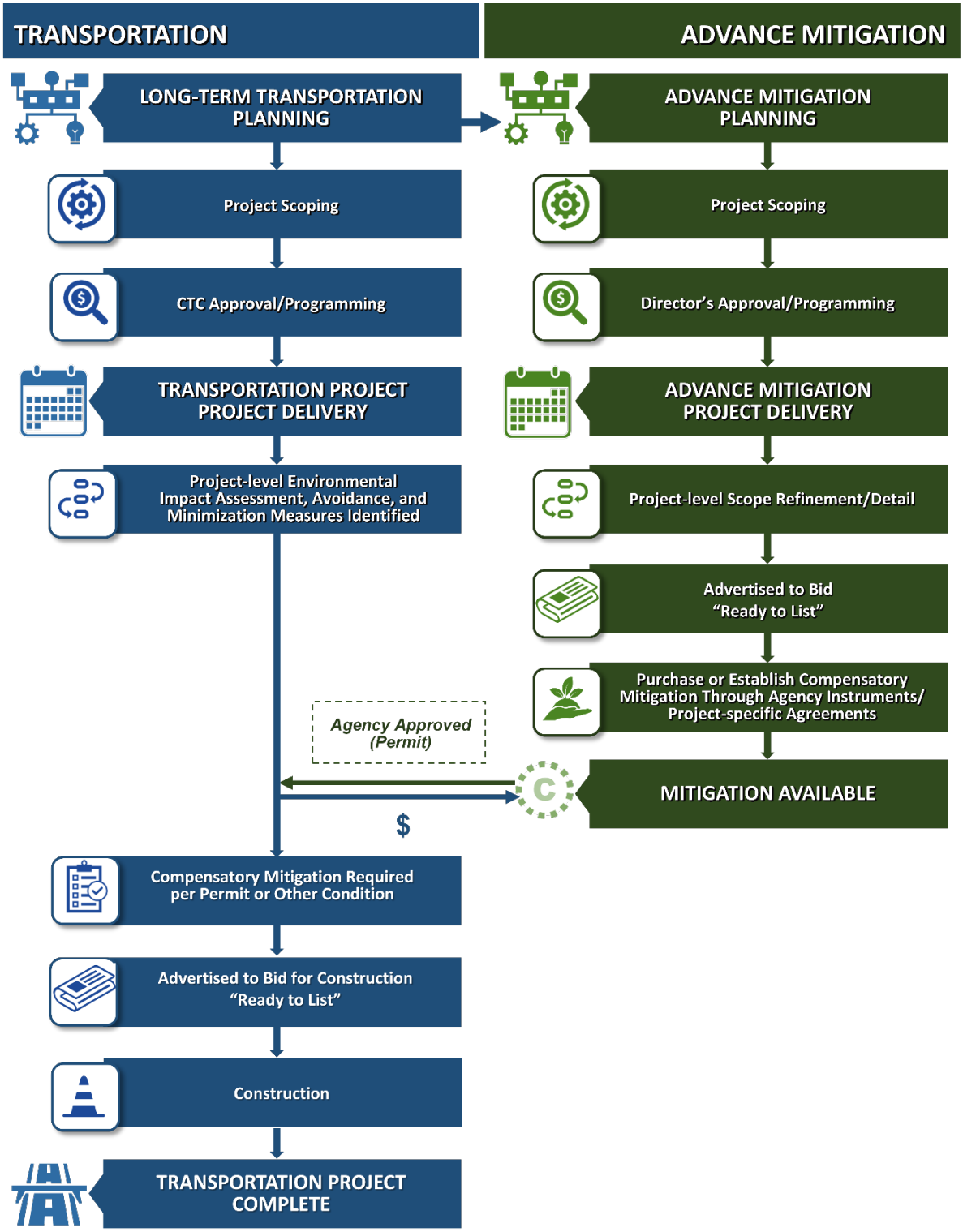
In this chapter, Caltrans summarizes the scheduling considerations and constraints of potential benefiting transportation projects in order to inform advance mitigation project schedules. A time frame for the forecast advance mitigation needs is provided and analyzed. The potentially benefiting transportation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

6.1 Why Timing is Important

Broadly speaking, an advance mitigation project is a SHC § 800.6(a)-authorized activity that consists of (1) purchasing compensatory mitigation that has been previously approved by the natural resource regulatory agencies through a conservation bank, mitigation bank, HCP/NCCP, or in-lieu fee program; or (2) establishing and receiving approval of compensatory mitigation credits, such as establishing a mitigation bank in accordance with existing laws, policies, procedures, templates, and guidance (see Table 1-1). Elaborated upon in Chapter 9, *Assessment of Authorized Activities*, the time it takes to deliver each authorized activity varies; however, purchasing compensatory mitigation credits would likely take less time than establishing compensatory mitigation credits.

Caltrans transportation projects must have permits and compensatory mitigation lined up before advertising and selecting a contractor to bid upon and perform a transportation project (Figure 6-1). Hence, for advance mitigation project scoping, the Caltrans District's nomination of a specific advance mitigation project type will be contingent, in part, on the anticipated timing of the potentially benefiting transportation project impacts. This is because, to benefit transportation projects as intended, the compensatory mitigation purchased or established through an advance mitigation project will need to be available to meet actual transportation project permit conditions established through an environmental study and document process undertaken prior to the transportation project incurring impacts (Figure 6-1).

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



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

6.2 Patterns of Estimated Potential Impacts

Given that the planning horizon for this assessment covers the 2021/22 through 2030/31 fiscal years, and that some of the transportation projects may have already gone to bid, it is necessary to consider which transportation projects:

- would need to acquire compensatory mitigation before the AMP can deliver, and hence the AMP cannot feasibly supply compensatory mitigation credits on the required schedule;
- would need compensatory mitigation delivered in a nearer time frame, which may favor seeking already existing credits as an AMP advance mitigation project scope; and
- would need compensatory mitigation farther out in time and, if so, whether there is time to establish new compensatory mitigation.

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

- As shown in Table 6-1 and on Figure 6-2, when the SHOPP transportation projects identified previously have their forecast species of mitigation need impacts examined relative to their expected advertising date, the compensatory mitigation needs are spread throughout the 10-year planning horizon for the Klamath Mountains Ecoregion Section, with the greatest impact acreage for foothill yellow-legged frog and fisher.
- As shown in Tables 6-2 through 6-14 and on Figures 6-3 through 6-15, when the SHOPP transportation projects identified previously have their aquatic resource impacts examined relative to their expected advertising date, the compensatory mitigation needs are spread throughout the 10-year planning period, as described below:
  - Compensatory mitigation needs in the Clear Creek-Sacramento River Sub-basin are limited to non-wetland waters in fiscal years 2025/26 and 2027/28 and fish habitat in fiscal years 2027/28 and 2030/31.
  - Compensatory mitigation needs in the Cow Creek Sub-basin are focused on wetlands in fiscal years 2021/22 and 2025/26 and non-wetland waters in fiscal year 2025/26.

[1] Ready to List is a named milestone within the Caltrans project delivery process. It is the point when a complete package is ready for contractors to bid on and a transportation project has been approved to be advertised to bid for construction.

- Compensatory mitigation needs in the Lower Klamath Sub-basin are focused on fish habitat, non-wetland waters, and riparian habitat in fiscal years 2021/22, 2023/24, 2025/26, 2029/30, and 2030/31, with the greatest anticipated impacts in fiscal year 2025/26 and only minor impacts to wetlands in fiscal year 2023/24.
- Compensatory mitigation needs in the Lower Pit Sub-basin are limited to fish habitat, wetlands, and non-wetland waters in fiscal year 2025/26.
- Compensatory mitigation needs in the McCloud Sub-basin are limited to fish habitat and non-wetland waters in fiscal year 2029/30.
- Compensatory mitigation needs in the Sacramento Headwaters Sub-basin are focused on non-wetland waters and riparian habitat in fiscal years 2021/22, 2025/26, 2027/28, 2028/29, and 2029/30, with the greatest anticipated impacts to non-wetland waters in fiscal year 2029/30 and only minor impacts to wetlands in fiscal year 2021/22.
- Compensatory mitigation needs in the Salmon Sub-basin are limited to riparian habitat in fiscal year 2025/26.
- Compensatory mitigation needs in the Scott Sub-basin are focused on non-wetland waters in fiscal years 2026/27 and 2029/30, with minimal impacts to riparian habitat in fiscal year 2026/27 and to wetlands in 2029/30.
- Compensatory mitigation needs in the Shasta Sub-basin are limited to wetlands and non-wetland waters in fiscal years 2020/21 and 2029/30 and non-wetland waters in fiscal year 2025/26.
- Compensatory mitigation needs in the Smith Sub-basin are limited to non-wetland waters in fiscal years 2023/24 and 2028/29.
- Compensatory mitigation needs in the South Fork Trinity Sub-basin are limited to wetlands and non-wetland waters in fiscal year 2027/28.
- Compensatory mitigation needs in the Trinity Sub-basin are spread throughout the 10-year planning period, with the greatest need for non-wetland waters and riparian habitat in fiscal year 2021/22; lesser impacts to non-wetland waters in fiscal years 2023/24, 2024/25, 2025/26, 2027/28, 2028/29, and 2030/31; and minimal impacts to riparian habitat in fiscal year 2025/26 and to wetlands in fiscal years 2025/26, 2027/28, and 2030/31.
- Compensatory mitigation needs in the Upper Klamath Sub-basin are focused on wetlands and non-wetland waters in fiscal years 2023/24, 2026/27, and 2029/30, with impacts to riparian habitat in fiscal year 2029/30.

Spatially, these transportation projects are distributed throughout the GAI (Figure 6-16).

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

Expected Advertisement Year	Foothill Yellow-legged Frog: Number of Transportation Projects	Foothill Yellow-legged Frog: Estimated Potential Impacts (acres)	Shasta Salamander: Number of Transportation Projects	Shasta Salamander: Estimated Potential Impacts (acres)	Fisher: Number of Transportation Projects	Fisher: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	10	13.3	0	0.0	8	5.7	24.9
2022/23	1	<0.1	0	0.0	0	0.0	0.6
2023/24	4	8.8	0	0.0	3	4.4	16.5
2024/25	1	1.6	0	0.0	1	1.4	0.1
2025/26	8	11.9	3	0.9	6	4.5	17.8
2026/27	2	2.5	0	0.0	1	<0.1	7.3
2027/28	5	4.7	1	1.4	4	2.9	11.7
2028/29	2	0.5	0	0.0	2	0.2	3.3
2029/30	4	9.9	1	2.2	3	3.5	17.8
2030/31	1	2.6	0	0.0	1	1.3	0
Total[b]	**38**	**55.8**	**5**	**4.4**	**29**	**23.9**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

Figure 6-2. Klamath Mountains Ecoregion Section: Estimated Impacts on Species of Mitigation Need in the GAI, by Transportation Project Delivery Year

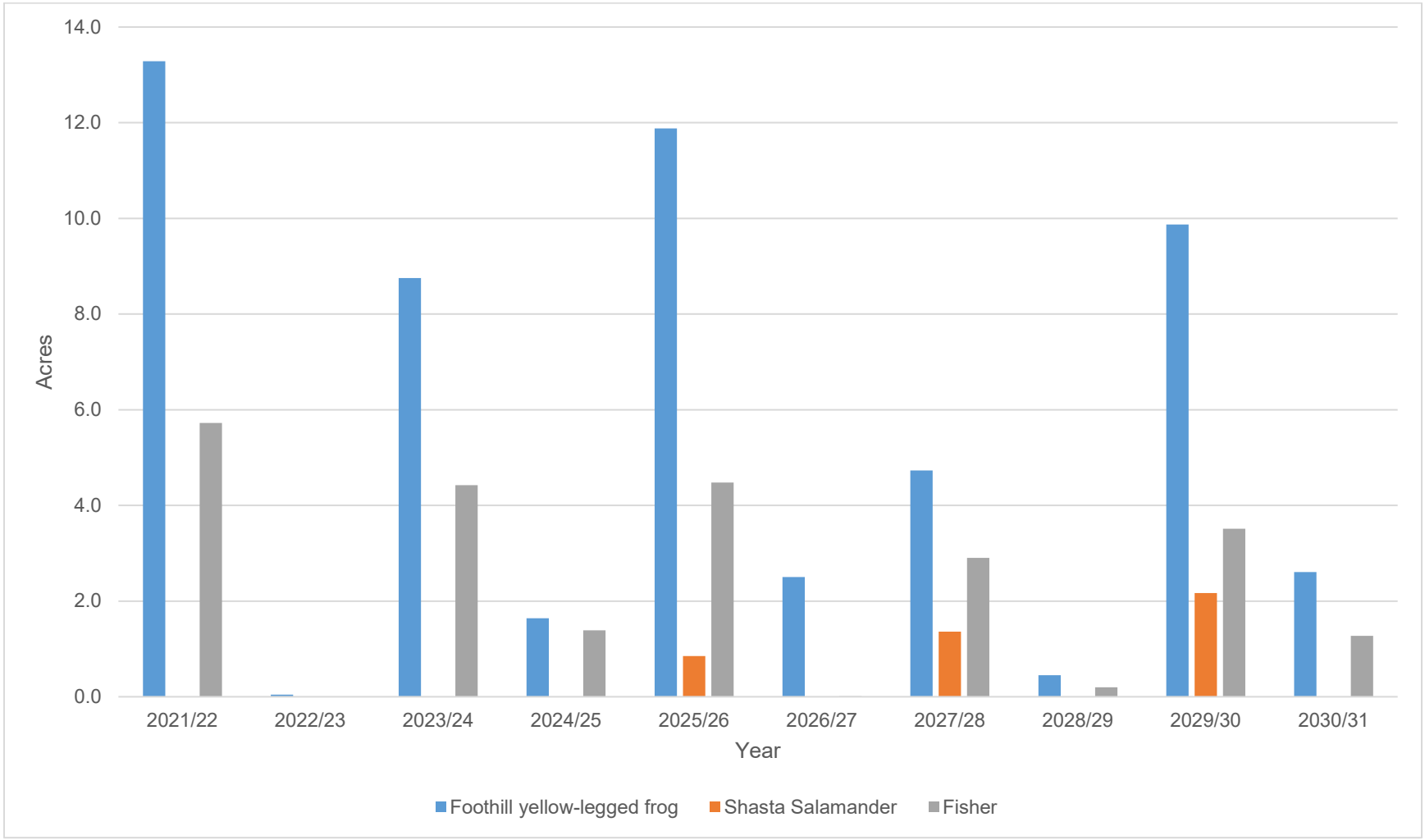


Table 6-2. Clear Creek-Sacramento River Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	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
2025/26	0	0.0	0	0.0	1	0.1	0	0.0	5
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0
2027/28	1	0.7	0	0.0	1	0.7	0	0.0	79
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0
2030/31	1	0.3	0	0.0	0	0.0	0	0.0	16
Total[b]	**2**	**1.0**	**0**	**0.0**	**2**	**0.8**	**0**	**0.0**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

Figure 6-3. Clear Creek-Sacramento River Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

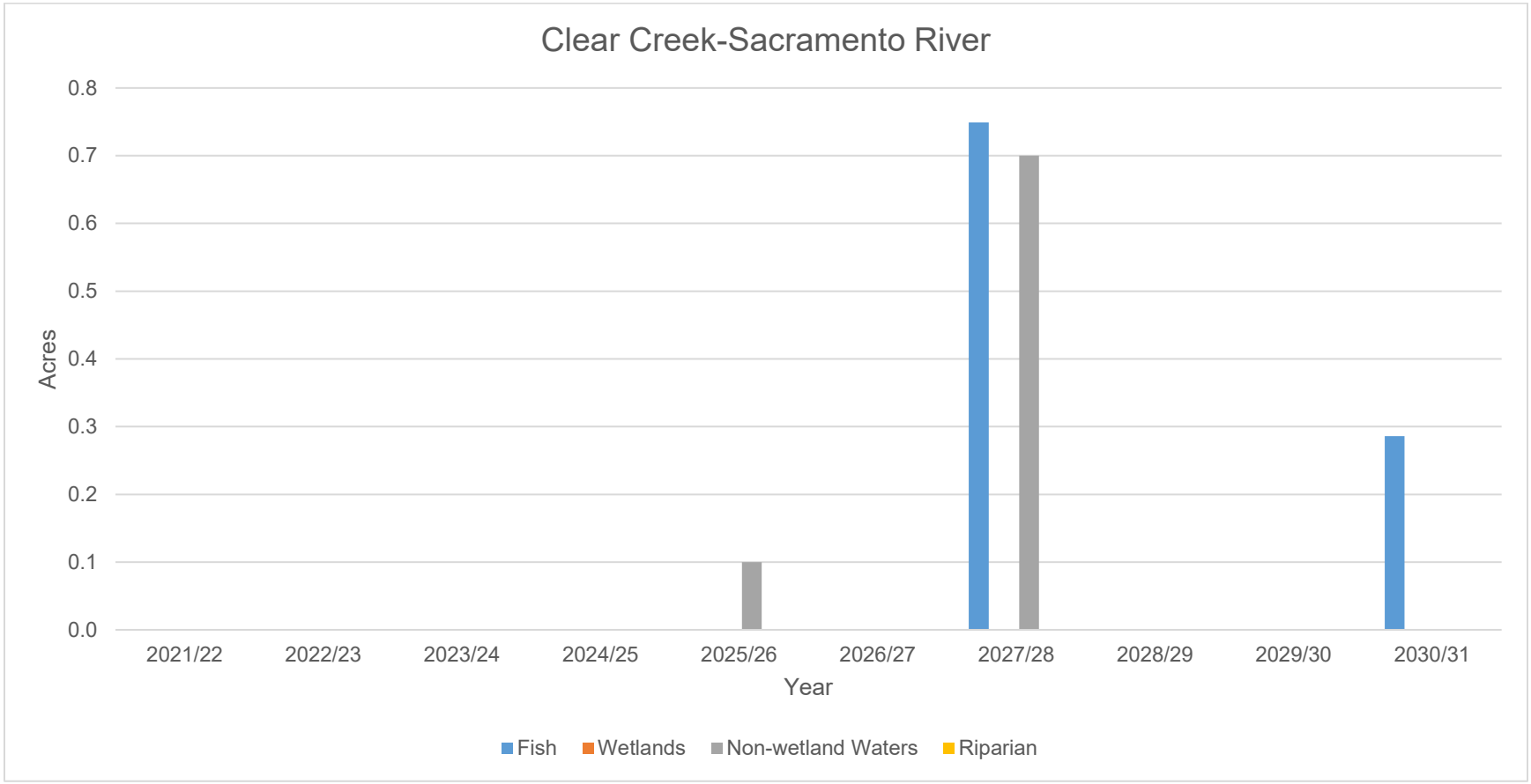


Table 6-3. Cow Creek Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	1	0.1	0	0.0	0	0.0	23
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0
2025/26	0	0.0	1	0.3	1	<0.1	0	0.0	77
2026/27	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
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**0**	**0.0**	**2**	**0.4**	**1**	**<0.1**	**0**	**0.0**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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

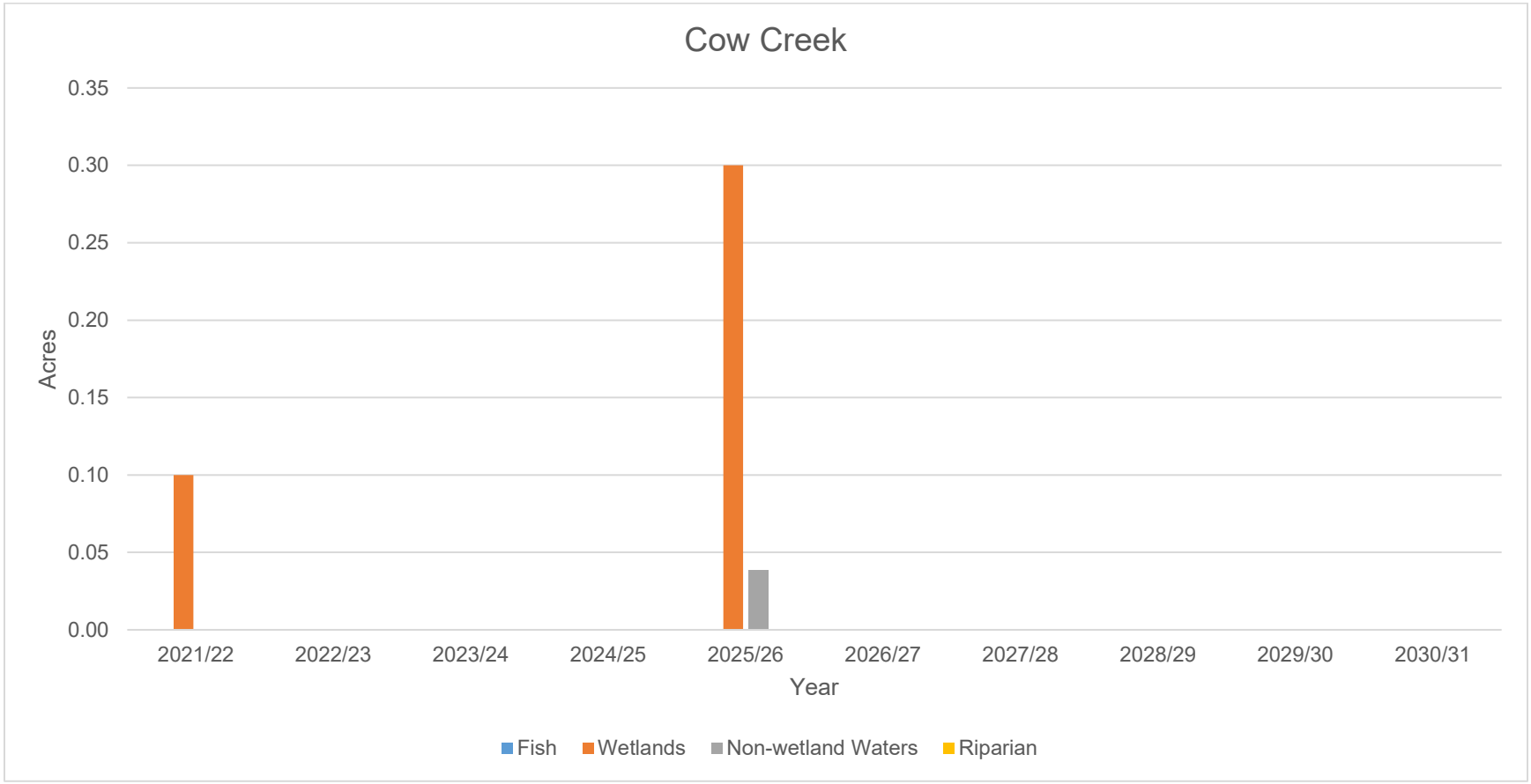


Table 6-4. Lower Klamath Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	1	0.3	0	0.0	1	0.3	0	0.0	26
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	1	0.1	1	<0.1	1	0.1	0	0.0	9
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0
2025/26	1	0.2	0	0.0	1	0.2	1	0.3	28
2026/27	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
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0
2029/30	1	0.1	0	0.0	1	0.1	1	<0.1	9
2030/31	1	0.3	0	0.0	1	0.3	0	0.0	28
Total[b]	**5**	**0.9**	**1**	**<0.1**	**5**	**0.9**	**2**	**0.3**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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

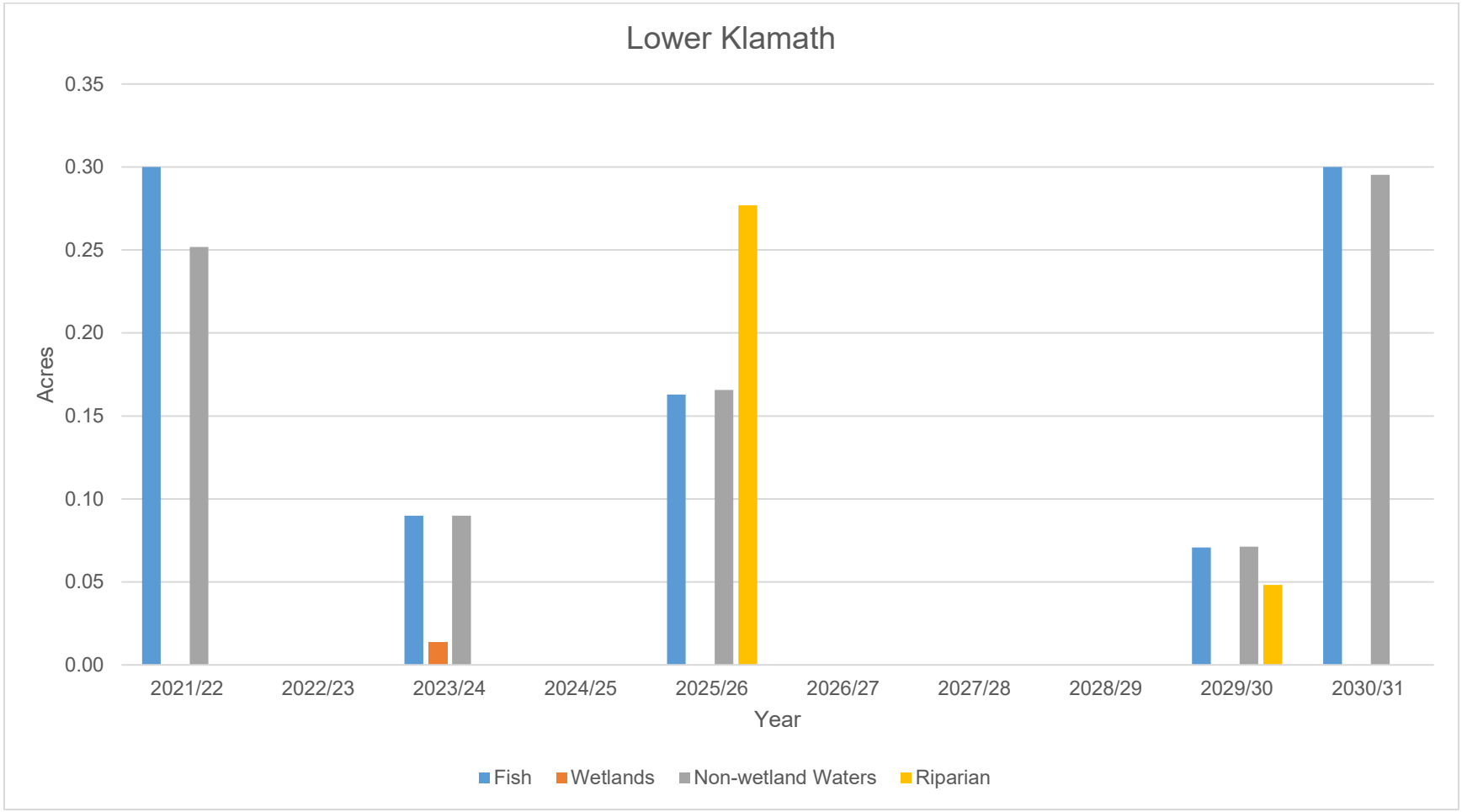


Table 6-5. Lower Pit Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	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
2025/26	2	0.3	1	0.1	2	0.3	0	0.0	100
2026/27	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
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**2**	**0.3**	**1**	**0.1**	**2**	**0.3**	**0**	**0.0**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

Figure 6-6. Lower Pit Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

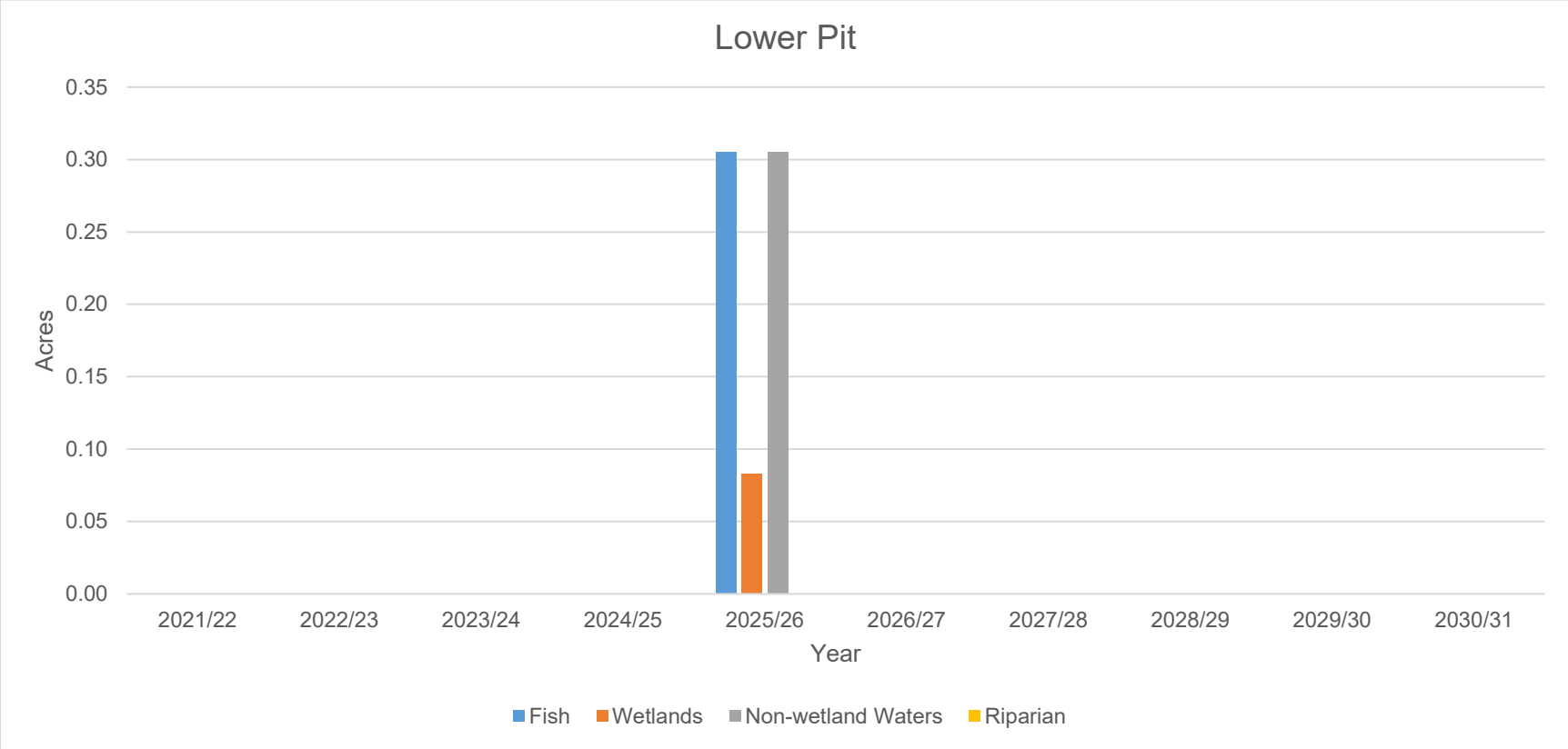


Table 6-6. McCloud Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	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
2025/26	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
2027/28	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
2029/30	1	0.5	0	0.0	1	0.5	0	0.0	100
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**1**	**0.5**	**0**	**0.0**	**1**	**0.5**	**0**	**0.0**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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

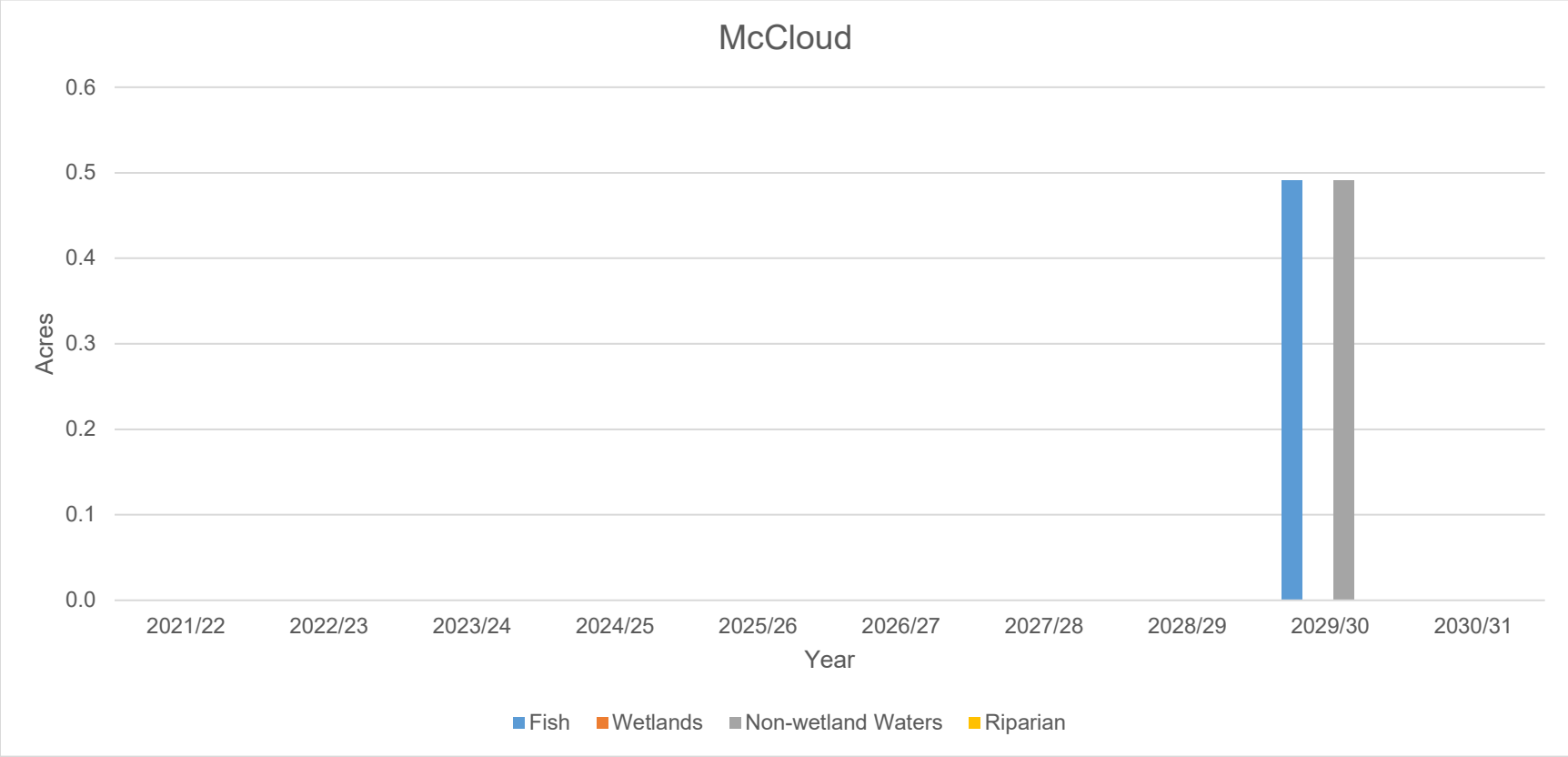


Table 6-7. Sacramento Headwaters Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	1	<0.1	1	<0.1	0	0.0	2
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0
2025/26	0	0.0	1	<0.1	1	0.3	1	0.3	21
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0
2027/28	0	0.0	1	<0.1	1	0.1	1	<0.1	7
2028/29	0	0.0	0	0.0	1	<0.1	0	0.0	1
2029/30	0	0.0	0	0.0	1	2.0	0	0.0	69
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**0**	**0.0**	**3**	**<0.1**	**5**	**2.5**	**2**	**0.4**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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

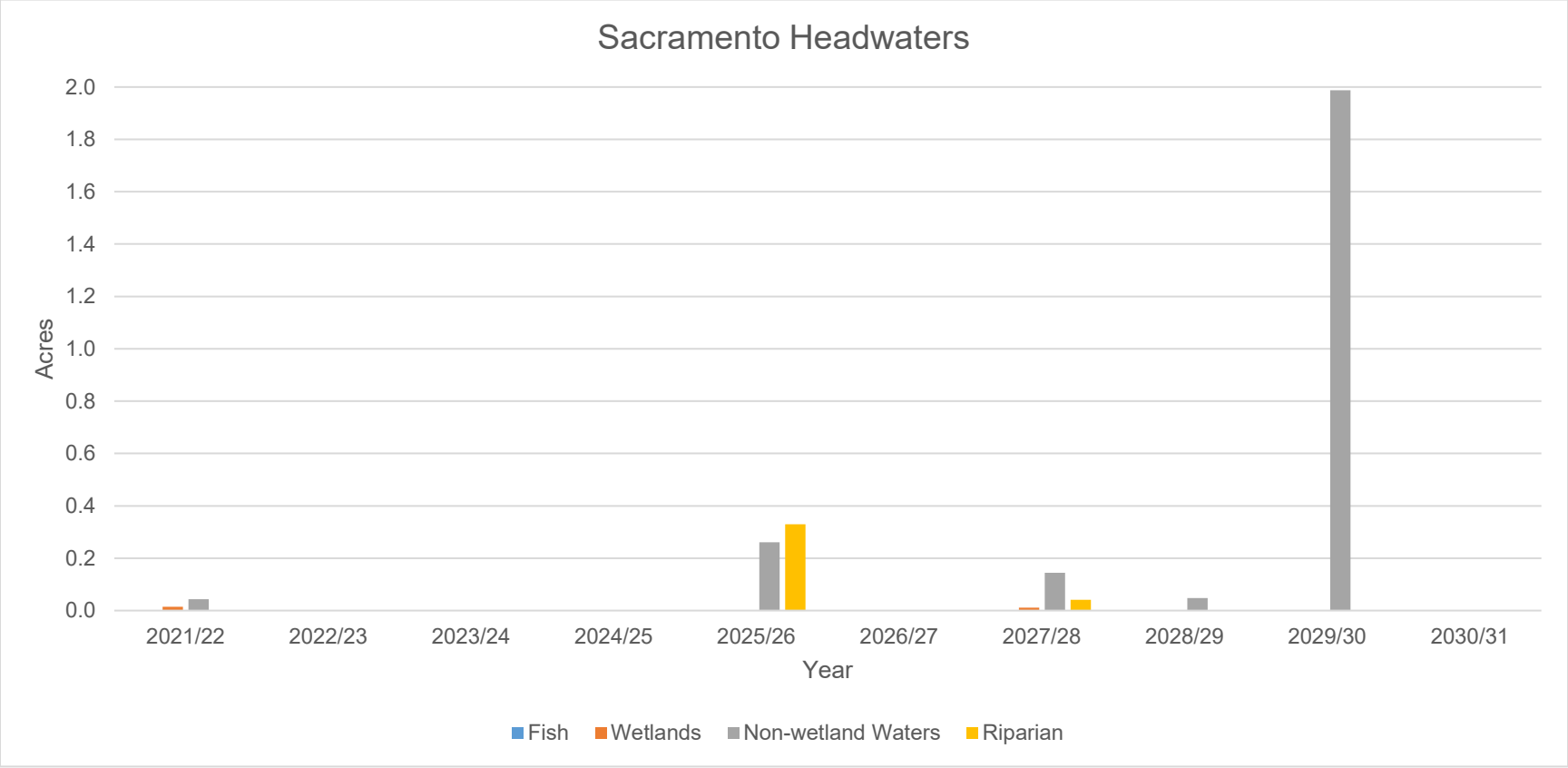


Table 6-8. Salmon Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	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
2025/26	0	0.0	0	0.0	0	0.0	1	0.2	100
2026/27	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
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**0**	**0.0**	**0**	**0.0**	**0**	**0.0**	**1**	**0.2**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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

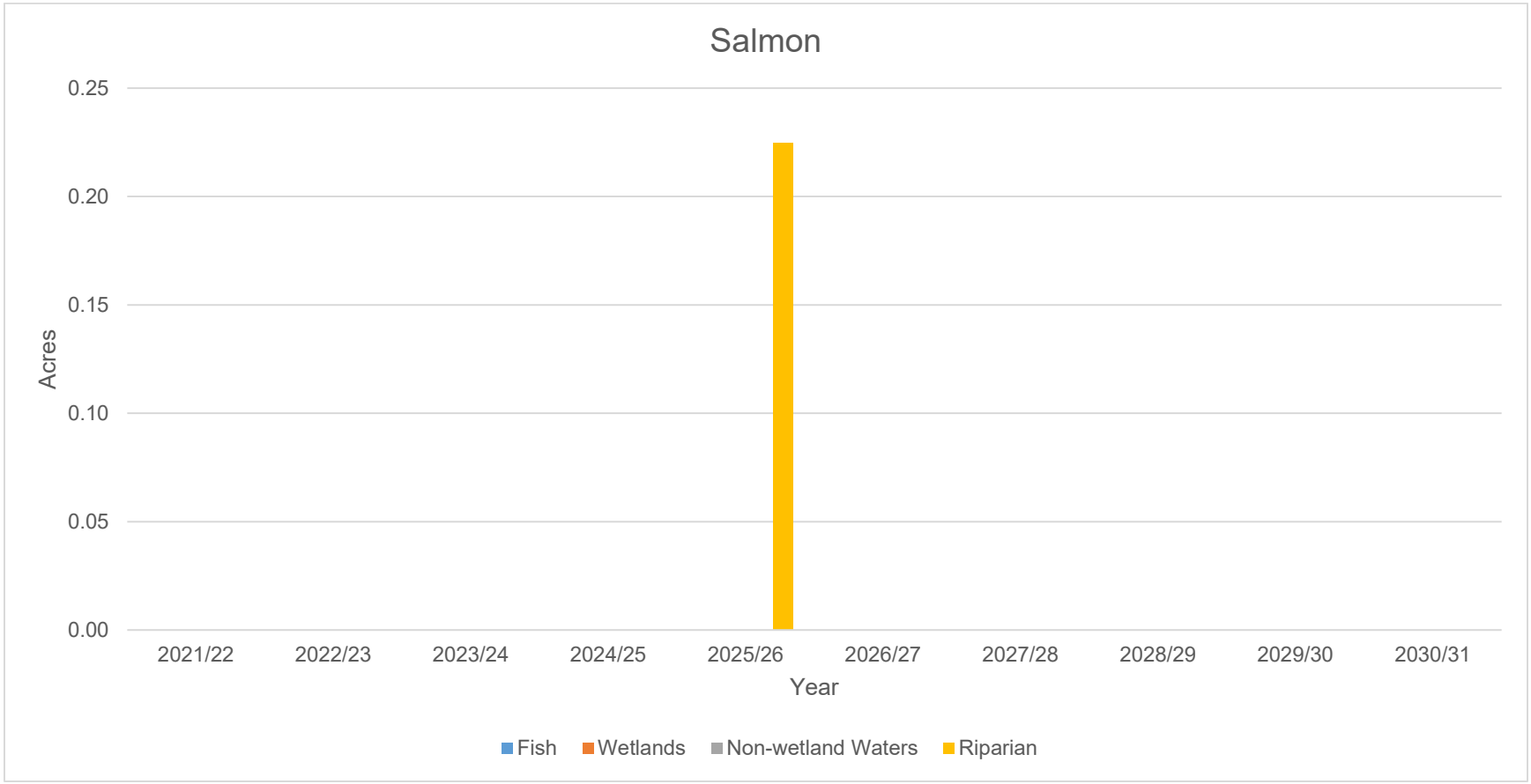


Table 6-9. Scott Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	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
2025/26	0	0.0	0	0.0	0	0.0	0	0.0	0
2026/27	0	0.0	0	0.0	1	0.1	1	<0.1	45
2027/28	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
2029/30	0	0.0	1	<0.1	1	0.1	0	0.0	55
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**0**	**0.0**	**1**	**<0.1**	**2**	**0.2**	**1**	**<0.1**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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

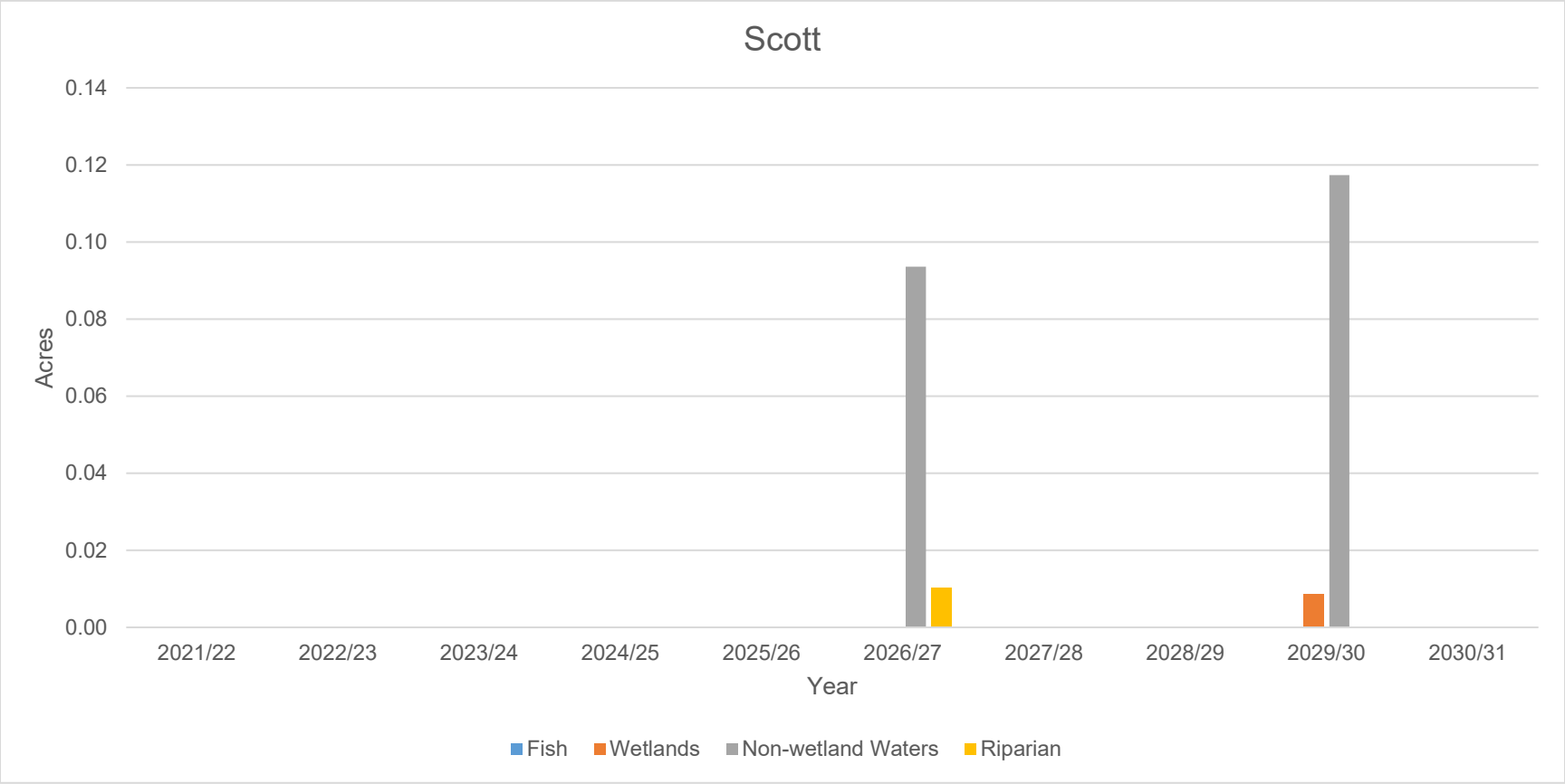


Table 6-10. Shasta Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	1	0.1	1	0.1	0	0.0	58
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	0	0.0	0	0.0	0	0.0	0	0.0	0
2024/25	0	0.0	0	0.0	0	0.0	0	0.0	0
2025/26	0	0.0	0	0.0	1	0.1	0	0.0	26
2026/27	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
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0
2029/30	0	0.0	1	<0.1	1	<0.1	0	0.0	16
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**0**	**0.0**	**2**	**0.1**	**3**	**0.2**	**0**	**0.0**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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

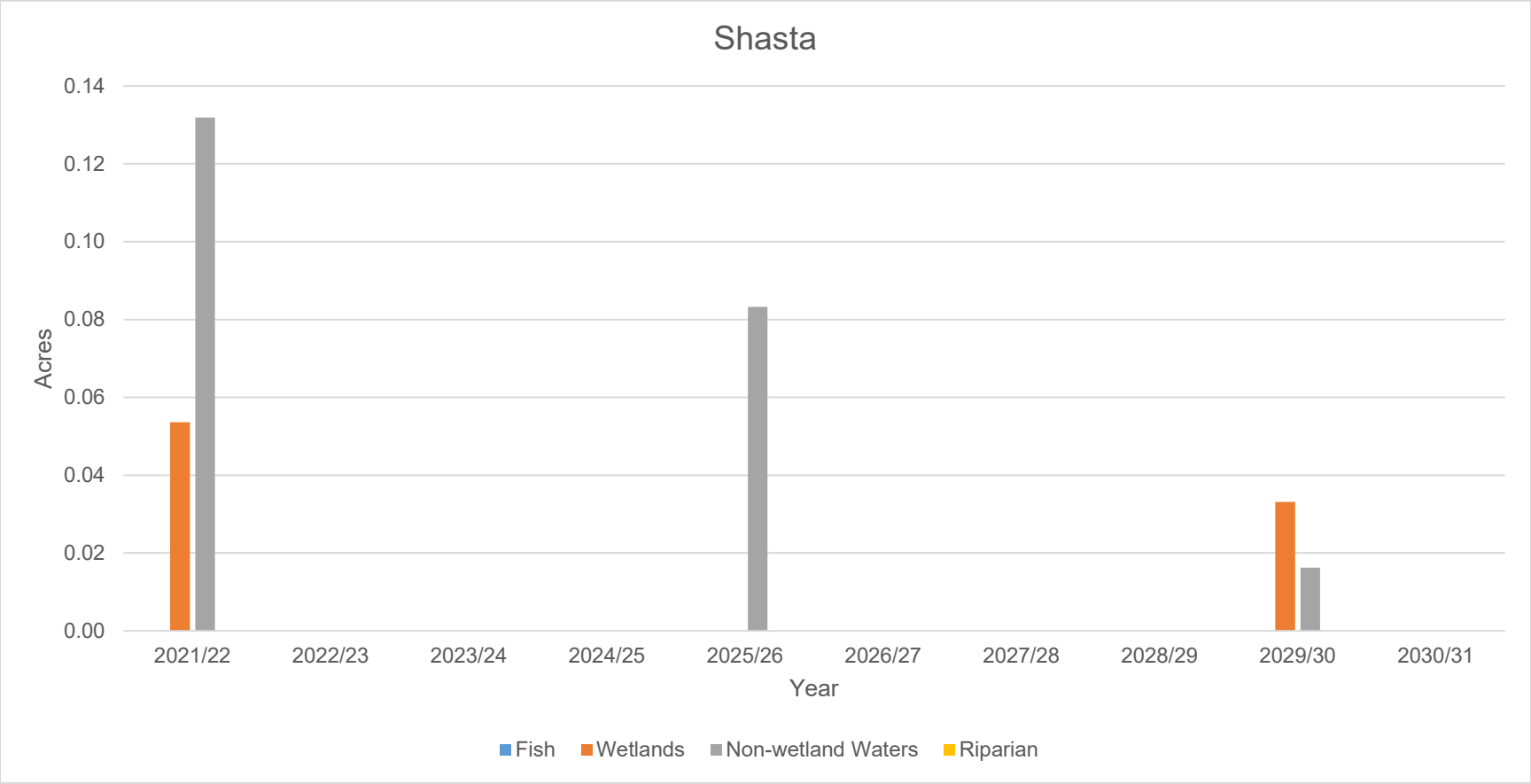


Table 6-11. Smith Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	0	0.0	0	0.0	1	<0.1	0	0.0	40
2024/25	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
2026/27	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
2028/29	0	0.0	0	0.0	1	<0.1	0	0.0	60
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**0**	**0.0**	**0**	**0.0**	**2**	**<0.1**	**0**	**0.0**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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

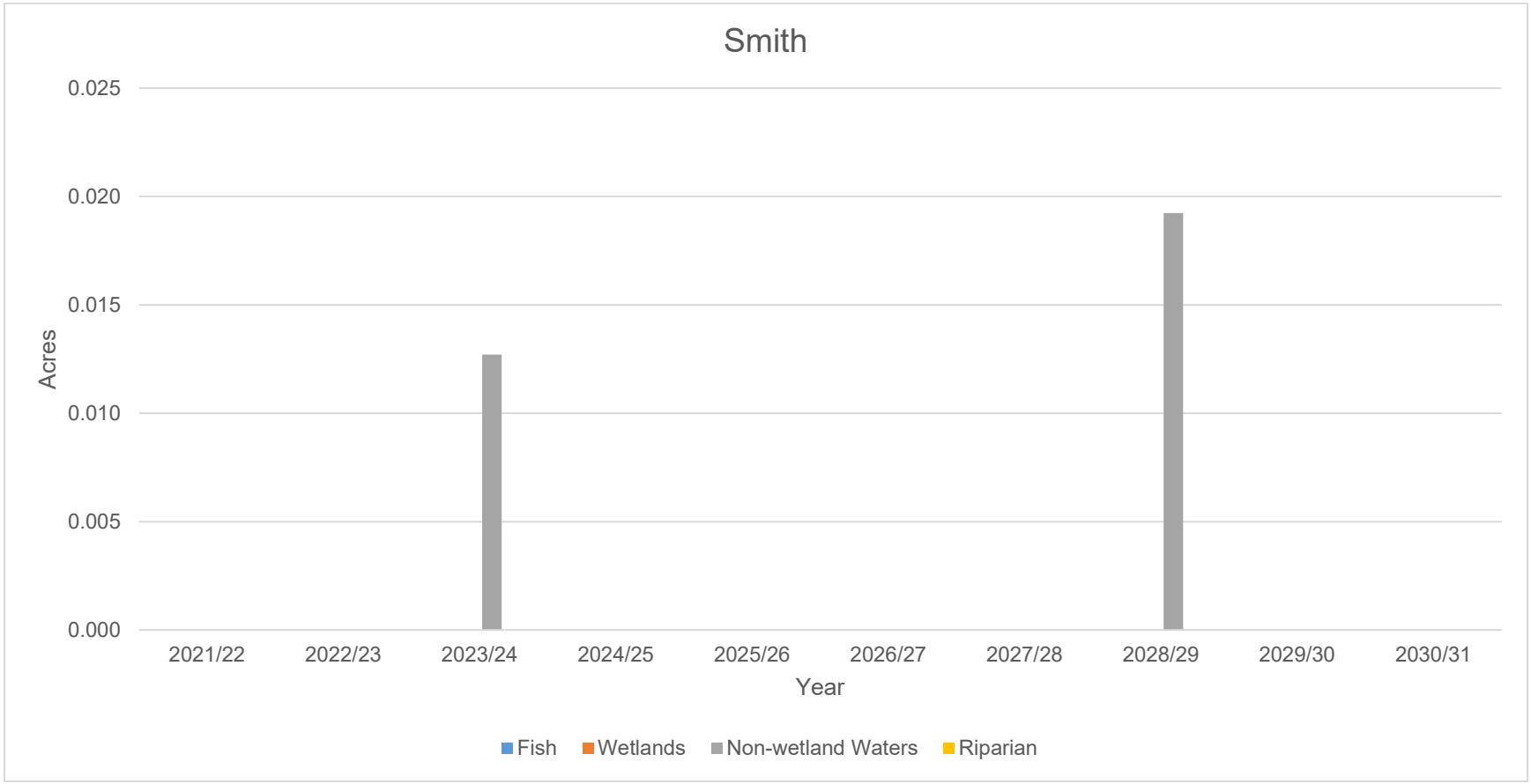


Table 6-12. South Fork Trinity Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	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
2025/26	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
2027/28	0	0.0	1	0.1	1	0.1	0	0.0	100
2028/29	0	0.0	0	0.0	0	0.0	0	0.0	0
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**0**	**0.0**	**1**	**0.1**	**1**	**0.1**	**0**	**0.0**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

Figure 6-13. South Fork Trinity Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

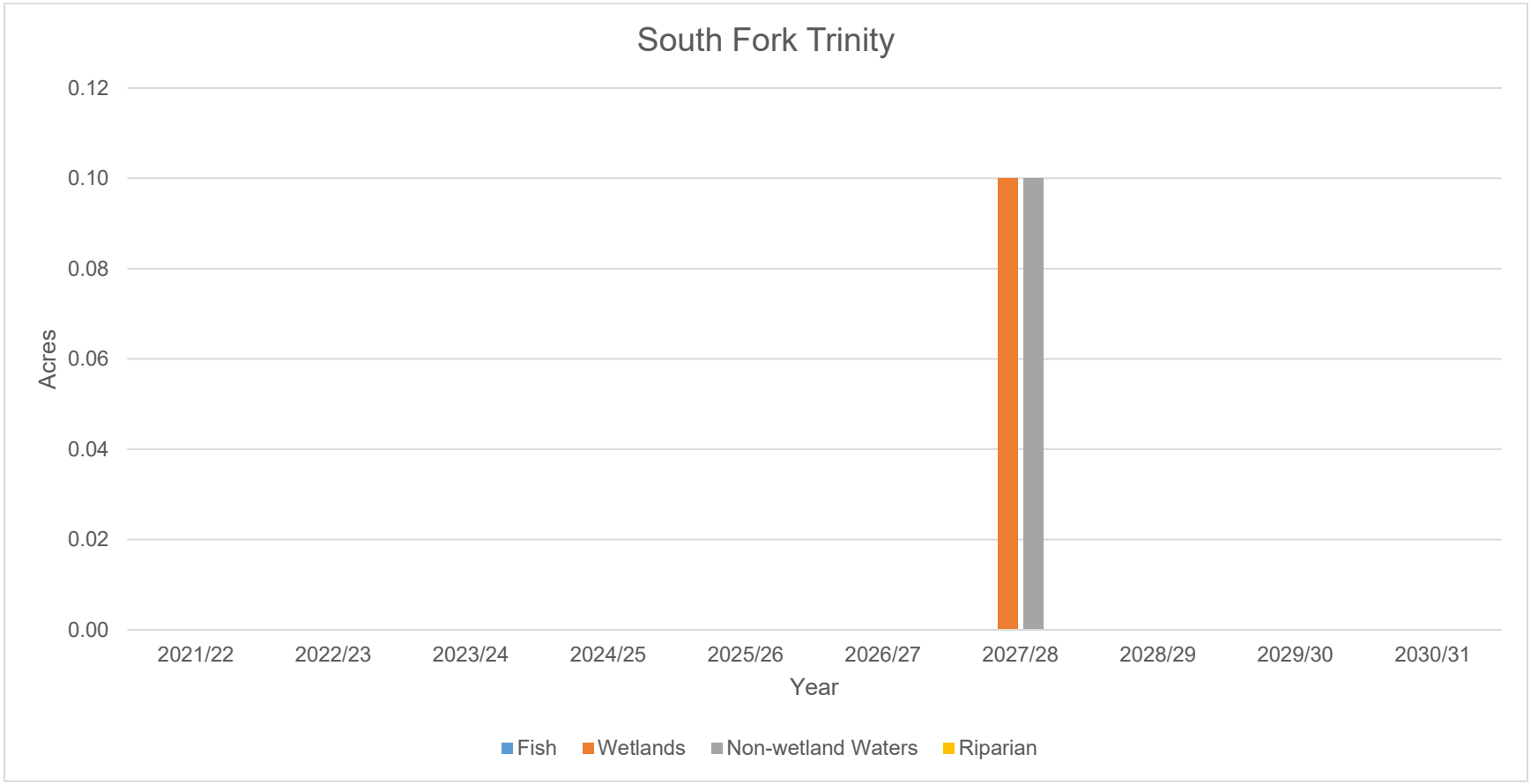


Table 6-13. Trinity Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	0	0.0	2	0.9	1	1.0	58
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	0	0.0	0	0.0	1	0.1	0	0.0	2
2024/25	0	0.0	0	0.0	1	0.2	0	0.0	5
2025/26	0	0.0	1	0.1	2	0.3	1	<0.1	12
2026/27	0	0.0	0	0.0	0	0.0	0	0.0	0
2027/28	0	0.0	1	<0.1	3	0.2	0	0.0	6
2028/29	0	0.0	0	0.0	1	<0.1	0	0.0	1
2029/30	0	0.0	0	0.0	0	0.0	0	0.0	0
2030/31	0	0.0	1	0.1	1	0.4	0	0.0	16
Total[b]	**0**	**0.0**	**3**	**0.2**	**11**	**2.1**	**2**	**1.0**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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

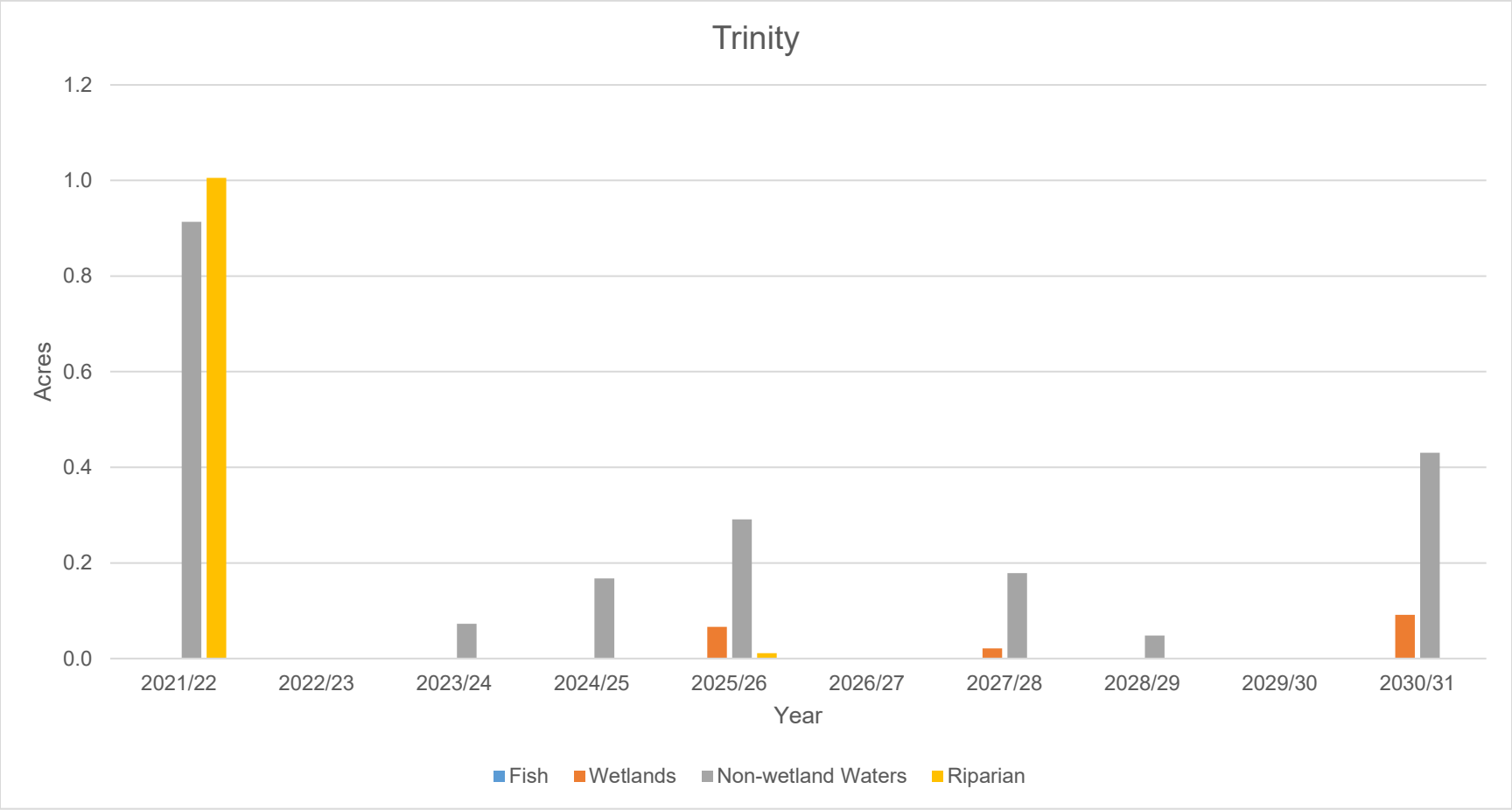


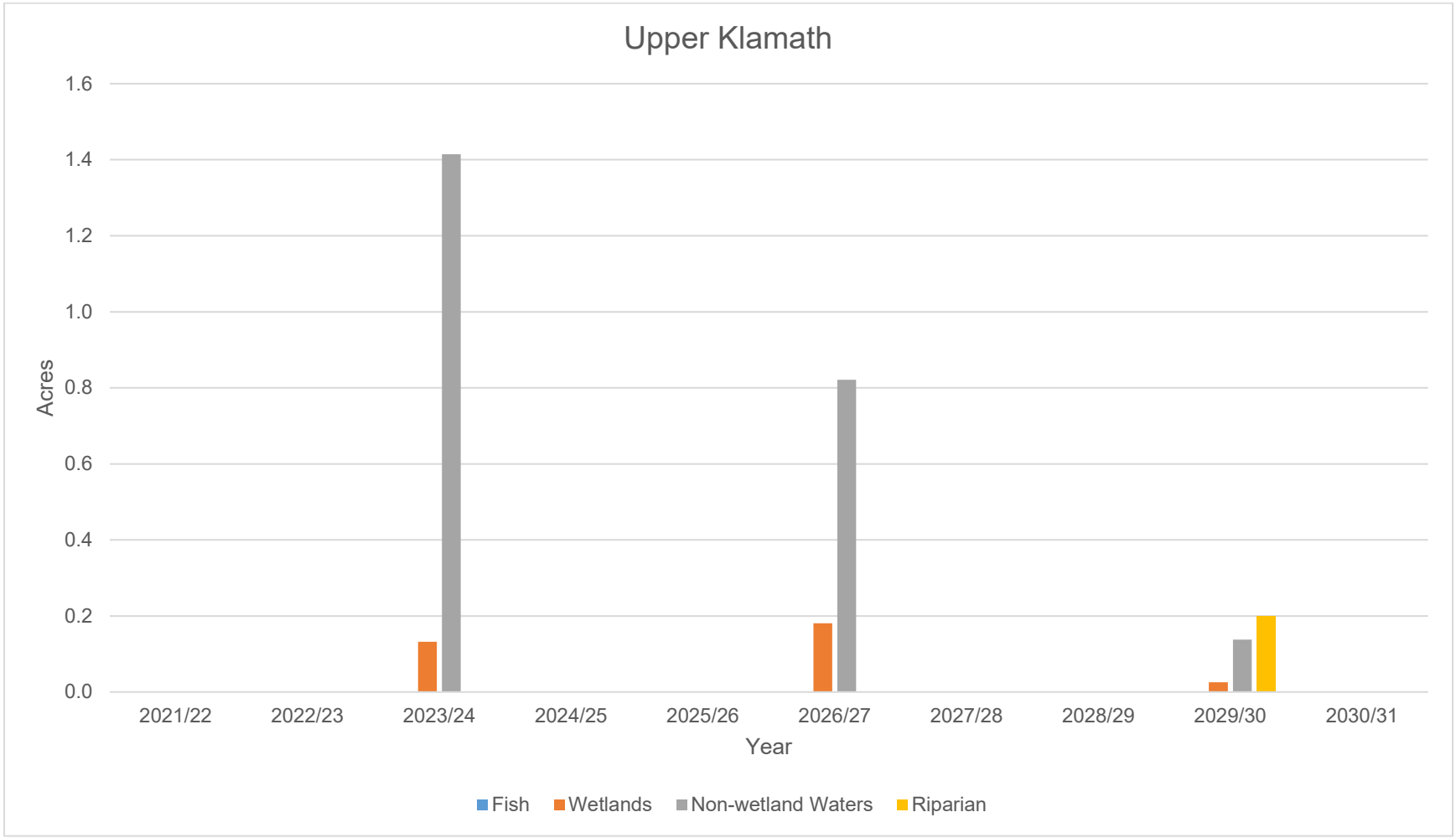
Table 6-14. Upper Klamath Sub-basin: Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

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)	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)	% of Total Mitigation Need[a]
2021/22	0	0.0	0	0.0	0	0.0	0	0.0	0
2022/23	0	0.0	0	0.0	0	0.0	0	0.0	0
2023/24	0	0.0	1	0.1	1	1.4	0	0.0	53
2024/25	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
2026/27	0	0.0	1	0.2	1	0.8	0	0.0	35
2027/28	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
2029/30	0	0.0	1	<0.1	1	0.1	1	0.2	12
2030/31	0	0.0	0	0.0	0	0.0	0	0.0	0
Total[b]	**0**	**0.0**	**3**	**0.3**	**3**	**2.4**	**1**	**0.2**	**100%**

[a] Indicative of the timing of mitigation need.
[∑ impacts (year) ÷ ∑ total impacts]*100

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

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



6.3 Acceleration Priorities

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

Impact forecasts presented here are based on the transportation project sequencing provided in the 2021/22–2030/31 (Quarter 1) SHOPP Ten-Year Book (Figure 6-16). Since it was published, however, the transportation project delivery schedules may have changed or have been discontinued. The 2021 SHS Management Plan gave District 2 targets and funding for 263 lane miles of fair (Class 1) pavement. In other words, at this time, District 2's priorities are to develop projects that upgrade its 263 lane miles of roadways from fair condition to good condition. Prior to proposing advance mitigation projects, District 2 will consult the most recent SHS Management Plan to obtain an up-to-date estimate of the timing of transportation projects that may need credits established or purchased through the AMA.

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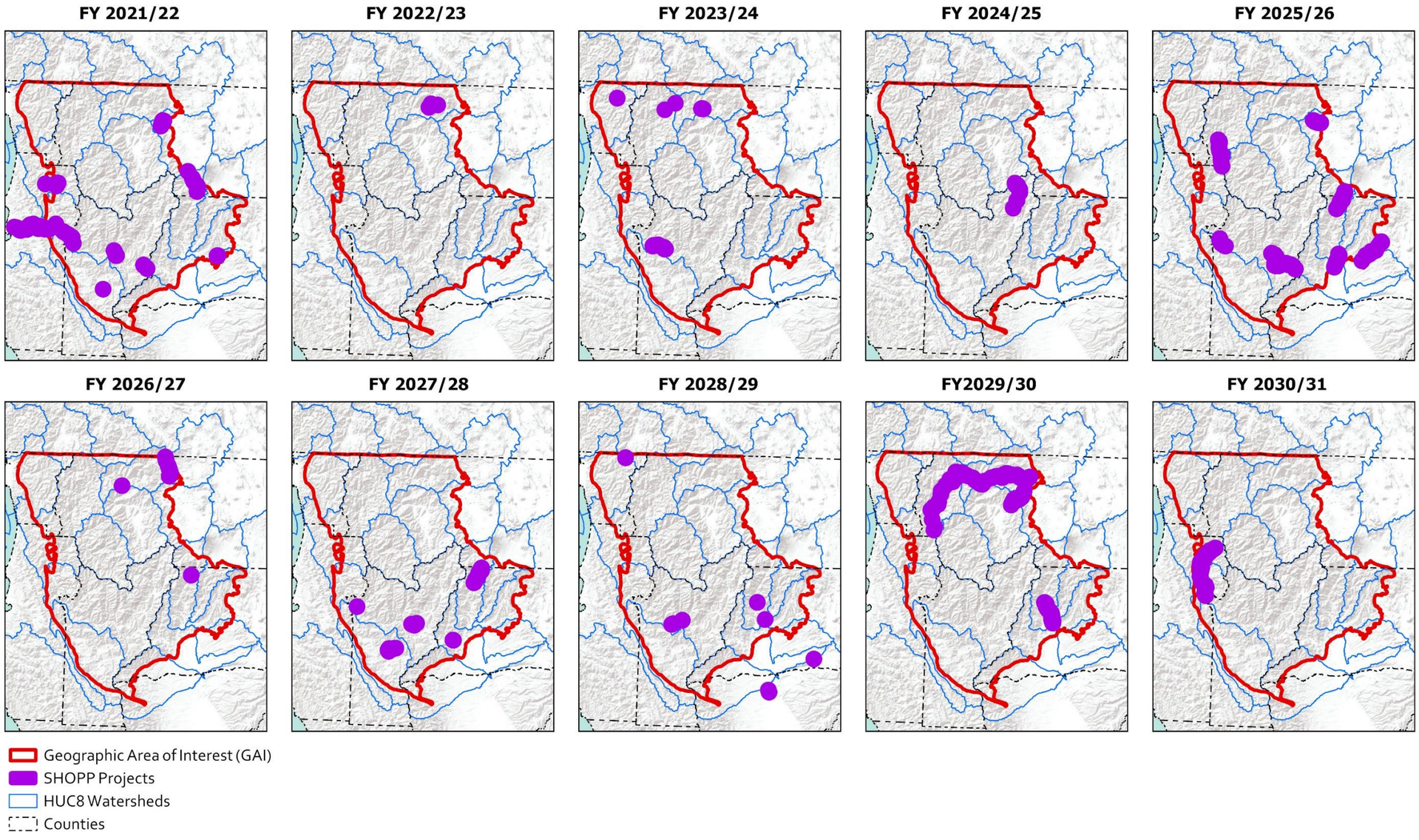
Figure 6-16. Location of SHOPP Estimated Impacts, by Transportation Project Delivery Year



Note: SHOPP transportation projects are listed in Appendix B.

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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 enhanced, restored, or created habitat and an improved environmental outcome that may not be available through the usual transportation project-by-project approach to compensatory mitigation.

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

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

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

7.1 Approach

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

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

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

- First, in Section 7.2, identifies the natural resource regulatory agencies with the authority to condition transportation projects with wildlife resource-related compensatory mitigation in the GAI.
- Then, in Section 7.3, summarizes the life history information for the three wildlife species of mitigation need chosen to focus the assessment, as identified in Section 1.6.
- Next, in Sections 7.4, 7.5, and 7.6, for the species of mitigation need, identifies:
  - Federal and state binding and non-binding regional conservation and land management plans
  - Current and projected pressures and stressors for which there is a potential transportation nexus
  - Opportunities to enhance the conservation benefits through advance mitigation projects
  - Opportunities to benefit other special-status and native wildlife species through advance mitigation
- Last, analyzes the aforementioned information in relation to the transportation-related activities that could potentially affect the species of mitigation need, and the potential range of compensatory mitigation that could satisfy a future transportation project condition associated with the activities.

The result of this analysis is a framework of conservation goals and objectives for use in advance mitigation project scoping (Section 7.7).

7.2 Natural Resource Regulatory Agencies with Wildlife Resources Oversight

Table 7-1 lists the natural resource regulatory agencies with the authority to condition transportation projects delivered in the GAI with wildlife resource-related compensatory mitigation. The aquatic resources used by wildlife, such as streams, wetlands, and non-wetland waters, are 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 the Authority to Approve Wildlife Resource Compensatory Mitigation Credits (or Values)

Agency[a]	Summary
CDFW	CDFW oversees the conservation, protection, and management of fish, wildlife, native plants, and the habitats necessary for biologically sustainable populations of those species in California. CDFW's Environmental Review and Permitting, Conservation and Mitigation Banking, NCCP, and RCIS programs implement sections of the FGC, Title 14 of the California Code of Regulations, and Public Resources Code § 21000, et seq. These programs help fulfill CDFW's mission to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values. CDFW issues permits and agreements to project proponents under its authorities including incidental take permits and consistency determinations under CESA, Lake and Streambed Alteration Agreements, approvals of conservation and mitigation banks, approvals of MCAs and RCISs, and NCCP permits. NCCP permits can authorize the take of fully protected species.
FWS	FWS has jurisdiction over a broad range of fish and wildlife resources. FWS authorities related to these resources are codified under multiple statutes, including, but not limited to, the ESA. Most statutes give FWS an advisory role in mitigation. However, if a non-federal entity applies for an incidental take permit for a listed animal species, ESA Section 10(a)(2)(b) requires that the impact of any incidental take be minimized and mitigated to the maximum extent practicable. ESA Section 7(a)(1) also requires all federal agencies to use their authorities to conserve listed species. Many federal agencies have developed programs to include mitigation as part of the Section 7(a)(2) consultation on their proposed actions to partially fulfill this Congressional mandate. Conservation banking can assist federal and non-federal participants in the Section 7 and Section 10 process. In May 2003, FWS issued comprehensive federal guidelines designed to promote conservation banks as a tool for mitigating adverse impacts on species; the guidelines foster national consistency by standardizing establishment and operational criteria. Many activities conducted under Section 7 and Section 10 of the ESA result in adverse effects on listed species, including habitat loss or modification. One way to offset these types of impacts is to include in the project design a plan that involves the restoration and/or protection of similar habitat on site and/or off site. Purchasing credits in conservation banks is one method of protecting habitat on site or off site.
NMFS	NMFS has jurisdiction over marine species listed as threatened or endangered under the ESA. Federal agencies must consult with NMFS to ensure that their actions do not jeopardize the continued existence of ESA listed species or result in the destruction or adverse modification of designated critical habitat. NMFS also manages and conserves wildlife and fisheries resources in the marine and estuarine environment under the Magnuson-Stevens Fishery Conservation and Management Act. Federal agencies must consult with NMFS on any action that might adversely affect EFH. NMFS will advise federal agencies to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH. Magnuson-Stevens Fishery Conservation and Management Act EFH consultation can be done in tandem with ESA consultation. NMFS protects marine mammals under the Marine Mammal Protection Act, with the exception of sea otters, walruses, manatees, and polar bears, which are managed by FWS. With some exceptions, the Marine Mammal Protection Act prohibits the take of marine mammals, including harassment, hunting, capturing, collecting, or killing, in U.S. waters and by U.S. citizens on the high seas.

[a] In addition to the agencies listed above, the RWQCBs may exert jurisdiction over species to the extent that wildlife habitat, rare, threatened, or endangered species, warm freshwater habitat, cold freshwater habitat, or spawning, reproduction, and/or early development beneficial uses exist and would be affected by a project.

7.3 Species of Mitigation Need

An overview of wildlife resources is provided in Chapter 2, *Environmental Setting*. As described in Section 1.6, species of mitigation need were selected to focus the planning effort and improve the probability that advance mitigation projects undertaken by Caltrans will yield credits (or similar) that will be usable during the planning period. To this end, the terrestrial species of mitigation need identified for the GAI are foothill yellow-legged frog, Shasta and Samwel salamanders, and fisher. Each species is briefly described below.

7.3.1. Foothill Yellow-legged Frog

Foothill yellow-legged frog is a stream-dwelling amphibian 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 species is organized into six clades across its range, with the GAI situated completely within the Northwest/North Coast clade, where the species is considered a California species of special concern (CDFW 2019c). 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).

7.3.2. Shasta Salamander and Samwel Salamander

Shasta salamander and Samwel salamander are state threatened amphibian species with extremely limited distributions, occurring almost exclusively in limestone areas of mixed hardwood-conifer habitats at elevations between 1,100 and 2,550 feet in the vicinity of Shasta Lake (FWS 2021c). They are a member of the Plethodontid, or lungless salamander family, the members of which respirate through their skin and special tissue that lines their mouths. This adaptation requires that they live in damp environments. Shasta and Samwel salamanders breed in limestone caverns, often attaching their egg clusters to the cavern walls. They are susceptible to high temperatures and dry conditions and, as a result, are typically active above ground only from late fall through early spring, spending the warmest months of the year underground in caves, fissures, and under boulders and rocks on talus slopes (FWS 2021c).

7.3.3. Fisher

Fisher is a forest-dwelling mammal species in the weasel family that occurs across the boreal forests of Canada and the northern U.S. and south through the Appalachian Mountains, northern Rocky Mountains, Cascade Mountains, and Sierra Nevada Range. The West Coast DPS of the species has two subpopulations: the southern Sierra Nevada population (which occurs from Yosemite National Park south in the Sierra Nevada Range and is listed as federally endangered and state threatened) and the Northern California-Southwestern Oregon population, which includes the GAI and is considered a California species of special concern (FWS 2019).

Fishers occur predominantly in mature coniferous forests and mixed deciduous riparian habitats with high-percentage canopy closure. They are nocturnal for the most part, although usually most active at dawn and dusk, and sometimes during the day. They are mostly carnivorous, feeding on mammals up to the size of rabbits and porcupines, as well as birds, fruits, and some fungi. Fishers use cavities in large trees, brush piles, and hollow logs as dens. Young are born in late winter or spring and reach maturity by their second year (CDFW 2015b).

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 habitats 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 2015a), a pressure is defined as "an anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of the target. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target is likely to be significant." Additionally, stress is defined in the SWAP as "[a] degraded ecological condition of a target that resulted directly or indirectly from negative impacts of pressures (e.g., habitat fragmentation)" (CDFW 2015a).

*A Status Review of the Foothill Yellow-legged Frog (*Rana boylii*) in California* (CDFW 2019c), the *Special Status Assessment Report for the Shasta Salamander Complex (*Hydromantes shastae, H. samweli, *and* H. wintu*)* (FWS 2021c), and the *Report to the Fish and Game Commission: A Status Review of the Fisher in California* (CDFW 2015b) refer to these pressures and stressors as threats.

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

Document	Reference	Areas of Important Habitat
Special-status Taxa Documents	See below	See below
*A Status Review of the Foothill Yellow-legged Frog (*Rana boylii*) in California*	CDFW 2019c	Identifies six foothill yellow-legged frog clades, including the Northwest/North Coast Clade, which the GAI is entirely within.
*Species Status Assessment Report for the Shasta Salamander Complex (*Hydromantes shastae, H. samweli, *and* H. wintu*)*	FWS 2021c	Distribution maps show that the entire world range for all three species, including Shasta salamander and Samwel salamander, is situated completely within the GAI in the vicinity of Shasta Lake.
Report to the Fish and Game Commission: A Status Review of the Fisher in California	CDFW 2015b	Distribution maps show that the range of the northern California ESU of the species broadly overlaps the GAI.
Habitat Connectivity for Fishers and Martens in the Klamath Basin Region of California and Oregon	Spencer et al. 2019	Identifies habitat core areas and prioritizes landscape connectivity areas for conservation of the Pacific marten and Pacific fisher that overlap the GAI.
Conservation and Land Management Documents	See below	See below
California Essential Habitat Connectivity Project	Spencer et al. 2010	Identified Natural Landscape Blocks and Essential Connectivity Areas in a set of defined ecoregions. The GAI is situated entirely within the Klamath Mountains ecoregion.
Del Norte Coast Redwoods State Park Final General Plan Amendment/ Environmental Impact Report Mill Creek Addition	California State Parks 2010	Amendment to the Redwood State and National Parks General Management Plan for Del Norte Coast Redwoods State Park. Requires buffers around old growth on trails (500 feet), old growth on new facilities (0.25 mile), and fish-bearing streams (200 feet).

Document	Reference	Areas of Important Habitat
Foundation Document Redwood National and State Parks	NPS 2016	NPS' and California State Parks' supplemental joint management plan for Redwood National Park and Redwood State Parks. Identifies goals for the restoration of degraded watersheds, forests, and streams in the Redwood National Park expansion area and all of the Mill Creek watershed in Del Norte Coast Redwoods State Park.
Klamath National Forest Land and Resource Management Plan	USFS 2010	USFS' management plan for the Klamath National Forest. Pacific fisher and foothill yellow-legged frog are known to occur in the forest. Includes goals to manage a wildlife area west of Indian Creek in the GAI where fishers are known to occur. A riparian reserve management area occurs in the GAI. This area includes a goal to restore intermittent streams, in part by planting willows.
Proposed Redding Resource Management Plan and Final Environmental Impact Statement	BLM 1992	BLM's resource management plan for the Redding Field Office. The Shasta salamander and Samwel salamander are known to occur within limestone outcrops around the Shasta Lake area. Includes goals for the enhancement of northern spotted owl habitat, including those parcels at Eastman Gulch in the Trinity Management Area, Iron Dyke in the Klamath Management Area, and Crater Creek in the Scott Valley Management Area. Also includes goals for the enhancement of a number of stream systems.
Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment	NPS 2017b	NPS' invasive plant management plan for Redwood National Park. Identifies a number of invasive plant targets for removal from the park, including Himalayan blackberry.
Redwood State and National Parks General Management Plan	California State Parks 1999a	National Park Service's and California State Parks' joint management plan for Jedediah Smith Redwoods State Park, Del Norte Coast Redwoods State Park, and Prairie Creek Redwoods State Park. Jedediah Smith Redwoods State Park and Del Norte Coast Redwoods State Park overlap with the GAI. Establishes goals for the weed treatment of 9.5 miles of roads per year for watershed restoration.
Shasta-Trinity National Forest Land and Resource Management Plan	USFS 1995a	USFS' management plan for the Shasta-Trinity National Forest. Fisher are known to occur in Corral Bottom Management Area located in the southwest portion of the Big Bar District adjacent to the northern boundary of the Hayfork Ranger District. Shasta salamander and Samwel salamander are known to occur in the Trinity Unit of the natural resource area, including lands around Clair-Engle (Trinity) Lake and Nosoni Management Area, around Brock Mountain. Both management areas have a supplemental management direction to improve habitat for Shasta and Samwel salamanders.

Document	Reference	Areas of Important Habitat
Siskiyou National Forest Land and Resource Management Plan	USFS 1989	USFS' management plan for the Siskiyou National Forest. Foothill yellow-legged frog are known to occur in the Proposed Cedar Log Flat Research Natural Area. Fisher are known to occur in the forest as well. The plan includes general goals to improve riparian habitat, fish habitat, and watersheds. There are also goals for the enhancement of salmonid fish habitat in riparian management areas.
Six Rivers National Forest Land and Resource Management Plan	USFS 1995b	USFS' management plan for the Six Rivers National Forest. Fisher are known to occur in the forest. Contains guidelines that prioritize the Smith River, Klamath River tributaries, Trinity River tributaries, Mad River tributaries, and North Fork Eel River for restoration.
Smith River National Recreation Area Management Plan	USFS 1992	USFS' management plan for the Smith River National Recreation Area. Contains goals to restore designated streamside protection zones of classified river corridors and to restore and enhance Rattlesnake Lake and associated meadows, springs, and waterholes.
SWAP	CDFW 2015a	The GAI is situated entirely within the North Coast and Klamath SWAP geographic province: ▪ In the North Coast and Klamath Province, foothill yellow-legged frog, Shasta and Samwel salamanders, and fisher are all considered 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.
Upper Sacramento River Fisheries and Riparian Habitat Management Plan	California Department of Fish and Game 2012	A management plan by all California resource agencies, including CDFW and RWQCB, for the Upper Sacramento River fisheries and riparian habitat. Includes goals for the restoration of riparian habitat along the Sacramento River and its tributaries, including Clear Creek and Spring Creek near Whiskeytown Reservoir in the GAI.
Weaverville Joss House State Historic Park General Plan	California State Parks 1999b	California State Parks' management plan for Weaverville Joss House State Historic Park. A fisher record occurs less than 1 mile north of the park. Contains goals for the management of black locusts by pruning or removing infested trees and replacing with the appropriate trees. Includes goals for habitat restoration at Sidney Gulch and Weaver Creek.

Document	Reference	Areas of Important Habitat
County and City General Plans	See below	See below
Del Norte County General Plan	Del Norte County 2003	General plan for Del Norte County. The plan requires a 100-foot buffer from the edge of wetland habitat. Includes a land use designation for resource conservation areas. Should development be required within riparian areas and stream habitat, mitigation would be required, including on-site in-kind habitat replacement or elsewhere within the stream system through stream or riparian habitat restoration.
Hayfork Community Plan	Trinity County 1996	Community plan for Hayfork. Includes land use designations for resources and open spaces.
Humboldt County General Plan	Humboldt County 2017	General plan for Humboldt County. The plan designates Streamside Management Areas, which have 200-foot buffers from development. The plan also requires 100-foot buffers from non-designated perennial streams and 50-foot buffers for non-designated intermittent streams. Wetlands that are seasonal have 50-foot buffers and perennial wetlands have 150-foot buffers. Development in these buffers carries additional mitigation requirements. Includes land use designations of forestry recreation, floodplain, and natural resources
City of Redding General Plan	City of Redding 2020	General plan for Redding. Includes a general goal to improve water quality in city limits and restore native habitats with an emphasis on wetlands and riparian habitat. Includes a land use designation of greenway, which is equivalent to open space.
Tehama County General Plan Update 2009–2029	Tehama County 2009	General plan for Tehama County. Includes goals and policies for the restoration of oak woodlands. Includes a land use designation for conservation, including habitat resource, resource lands, and water.
Trinity County General Plan	Trinity County 2020	General plan for Trinity County. The Denny, Junction City, North Lake, Salyer/Burnt Ranch, Big Bar, Weaverville, Lewiston/Douglas City, Hyampom, Hayfork, Wildwood, and South Fork planning areas overlap with the GAI. Includes land use designations for resource lands and open space/conservation areas.
Weaverville Community Plan	Trinity County 2001	Community plan for Weaverville. Includes a land use designation of open space/federal.

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. These pressures and stressors were evaluated in relation to the types of effects that could result from transportation projects funded through SHOPP and STIP and whether the species of mitigation need could benefit from in-kind compensatory mitigation purchased or established through an advance mitigation project.

7.5.1. Habitat Loss, Fragmentation, and Degradation

Urbanization and other anthropogenic factors such as roads, poor grazing practices, and habitat invasion by nonnative species have led to the loss and degradation of existing habitat for all 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 can hinder the movement of wildlife and are considered permanent physical barriers leading to increased habitat fragmentation and isolation of populations (CDFW 2019c; FWS 2019, 2021c). 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). Roads near aquatic habitats that are poorly constructed or inadequately maintained may lead to increased erosion, sedimentation, and petrochemical runoff, negatively affecting amphibian populations including foothill yellow-legged frog. Culverts under roads may provide some connectivity for various species, both native and invasive, but if not constructed properly they also can impede dispersal and trap some species such as foothill yellow-legged frog. In some instances, ditches that form downstream of culverts may result in deep scoured pools that can support predatory fish and frogs or exhibit temporary habitat attributes where premature drying is a threat (CDFW 2019c).

Within the very small and remote range of Shasta salamander and Samwel salamander, permanent road construction projects are now rare. During the 1940s, construction of Shasta Dam, Interstate 5, and state highways and county roads in the area likely affected the current distribution and abundance of the species. However, in the modern era, habitat loss, fragmentation, and degradation affecting all three species in the Shasta salamander complex mostly derive from mining, especially limestone mining operations (FWS 2021c).

Vegetation management associated with wildfire suppression (timber harvest, prescribed fire, fuels reduction by removal of shrubs and snags, etc.) is the biggest cause of habitat loss, fragmentation, and degradation affecting fisher (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. When invasive, nonnative species enter an ecosystem, they may result in a reduction of biodiversity, degradation of

habitat, alteration of native genetic diversity, shifting of habitat types, and further threats to already endangered or threatened natural resources.

Introduced fish, crayfish, and bullfrogs are known to predate all life stages of foothill yellow-legged frog (CDFW 2019c). 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 and cape ivy (*Delairea odorata*) may alter the structure of native riparian habitat and decrease available surface water for foothill yellow-legged frog (CDFW 2019c). Invasive species are not thought to be a significant threat to Shasta and Samwel salamanders and fisher. However, the expansion of barred owl (*Strix varia*) into the GAI over the last few decades, commensurate with changes to the landscape brought about by European settlers, has the potential to affect predator-prey relationships at multiple levels (Livezey 2009), which may directly and indirectly affect Shasta salamanders and fishers.

7.5.3. Disease and Predation

Foothill yellow-legged frogs may be affected by chytridiomycosis, a disease caused by a fungal pathogen called chytrid. Although the effects of chytrid on foothill yellow-legged frogs are not well-understood, the pathogen is known to have caused mass mortality and population declines in other amphibian species (CDFW 2019c). To date, chytrid infection has not been documented in Shasta and Samwel salamanders, and the species is not thought to be particularly susceptible to any other diseases (FWS 2021c).

Predation is considered a major threat to two of the species of mitigation need in the GAI: foothill yellow-legged frog and fisher. As noted above, foothill yellow-legged frogs are susceptible to predation from invasive species including bullfrogs, crayfish, and nonnative fish (CDFW 2019c). Predation is considered the most significant cause of mortality for fishers in California, with bobcats (*Lynx rufus*), mountain lions (*Puma concolor*), and coyotes (*Canis latrans*) being their most frequent predators (CDFW 2015b). Given the reclusive nature of the species, predation is not thought to be a significant threat to Shasta and Samwel salamanders. However, they are sometimes predated by snakes, weasels, skunks, and raccoons and, as mentioned above, barred owls present a relatively recent predation threat to the species (FWS 2021c).

7.5.4. Climate Change and Drought

Section 2.4 provided a brief overview of the GAI's climate and available planning-level predictions for climate change in the region. In the next 30 years, the climate is expected to continue to change. Predicted climate change effects consist of projected extended periods of higher temperatures in the summer, large fluctuations in precipitation—with dry years becoming drier and wet years becoming wetter—and an increased risk of drought, wildfires, and landslides (Caltrans 2018b).

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 2019c). 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 associated with stream and river systems of the foothill portions of the GAI would be particularly susceptible to this type of climate change effect. Furthermore, the northern watersheds are expected to experience more severe impacts from the reduction in snowmelt than southern parts of the foothill yellow-legged frog's range (CDFW 2019c).

Potential effects of climate change on Shasta and Samwel salamander are not expected to be significant. While the species has a very limited range, which can have a limiting effect on resiliency, the extent to which its subterranean habitat conditions will be influenced by climate change is expected to be low (FWS 2021c). Climate change and drought are expected to have potentially significant impacts on fishers because of the increased risk of wildfires, tree mortality, and the likely resulting increase in hardwood cover and decrease in canopy cover, which could render much of the habitat in the GAI unsuitable for denning (FWS 2019).

Essential habitat connectivity in the GAI, including large remaining blocks of intact habitat or natural landscape, is shown on Figure 2-9. These areas are expected to provide opportunities for the species of mitigation need to respond to climate change stress by preserving large blocks of habitat and linkage areas that will allow migration toward more suitable habitat as the climate changes, and by providing protection for the ecological processes that support key habitat. The terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a) is presented on Figure 2-5. Climate resilience is low in the northwestern portion of the GAI in Del Norte County and along the Interstate 5 corridor in Shasta and Siskiyou Counties, with much of those areas having a rank of only 1 or 2. It is in these locations that impacts from climate change are expected to be the most severe in the GAI. Projected climate resilience increases in the more mountainous central portions of the GAI, reaching rankings of 4 or 5 near the highest peaks.

7.5.5. Contaminants

Pesticides, herbicides, mineral fertilizers, industrial chemicals, and airborne pollutants are known to have negative effects on amphibians. Foothill yellow-legged frogs are highly susceptible to toxicity from herbicides and pesticides (CDFW 2019c). Contaminants are not thought to be a significant threat to Shasta and Samwel salamanders (FWS 2021c).

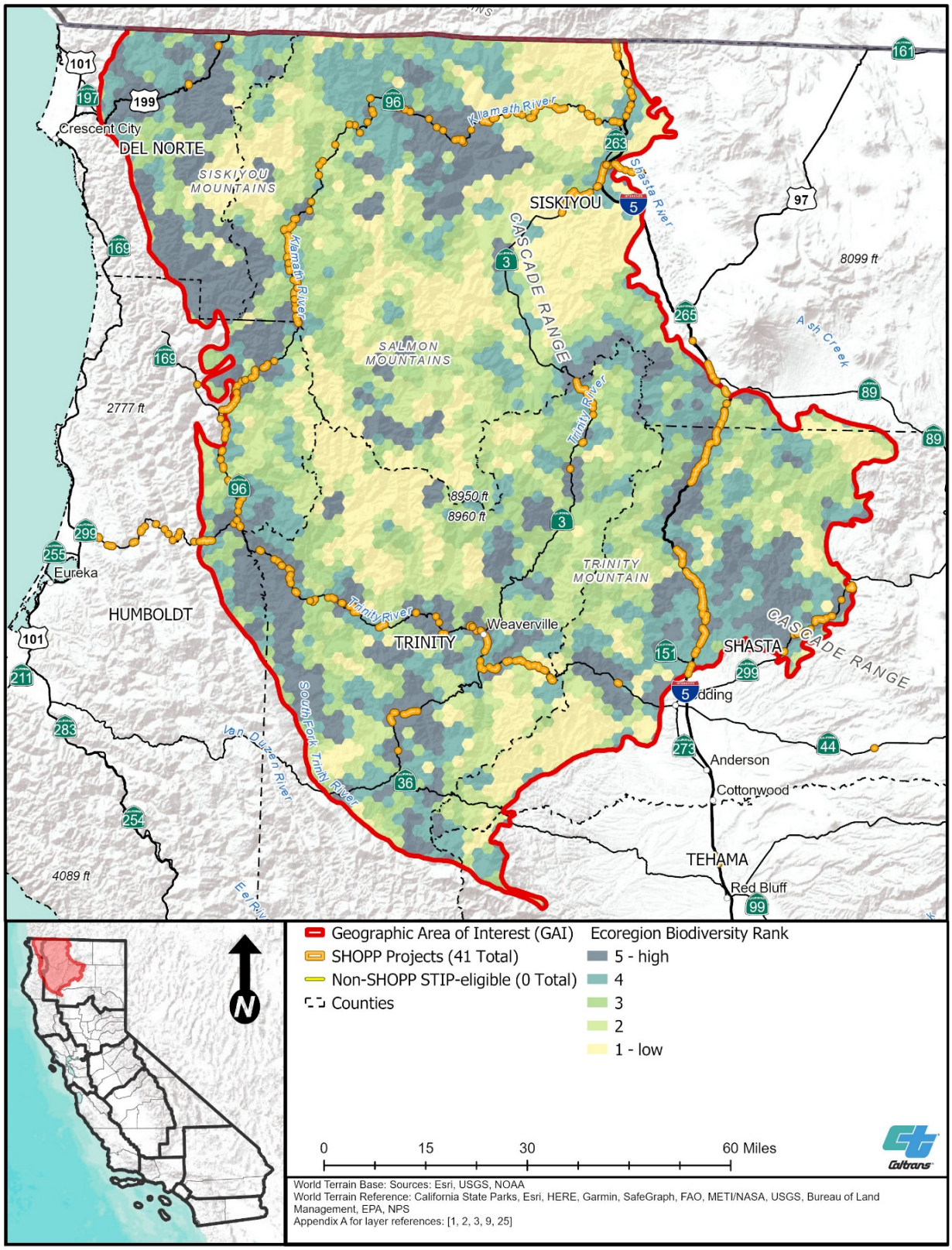
Toxicants, primarily anticoagulant and neurotoxicant rodenticides, are a frequent cause of fisher mortality and pose a potentially significant threat to fisher populations in the GAI. The most likely source of exposure to these toxicants within occupied fisher habitat in California is rodenticides associated with marijuana cultivation (FWS 2019).

7.6 Multi-species Benefits

While the terrestrial species of mitigation need identified for this GAI are foothill yellow-legged frog, Shasta and Samwel salamanders, and fisher, several other special-status species share habitat with these species and could potentially be affected by Caltrans transportation projects that will need compensatory mitigation to satisfy natural resource regulatory agency conditions on a transportation project. This includes species such as Cascades frog (*Rana cascadae*), northern goshawk (*Accipiter gentilis*), and wolverine (*Gulo gulo*), which may be addressed under CDFW's Lake and Streambed Alteration Agreement program. Advance mitigation planning provides Caltrans an opportunity to prioritize multi-species and multi-resource benefits through acquisition, protection, restoration, and/or enhancement of habitat that provides the most multi-species benefits within the GAI. Figure 7-1 illustrates the regional terrestrial biodiversity in the GAI, according to CDFW's ACE GIS dataset. According to these data, high to moderate terrestrial biodiversity is present along much of the SHS with SHOPP and STIP-eligible projects, while other portions of the SHS within the GAI with SHOPP and STIP-eligible projects show low biodiversity. Habitats are mapped in Appendix C, *Land Cover Types*, and the other special-status species that may occur in these habitats are provided in Appendix D, *Complete SAMNA Species Results*.

The installation of 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 habitat in order to inform advance mitigation scoping and thereby improve the conservation benefits of mitigation in the GAI.

Figure 7-1. Terrestrial Biodiversity in the GAI



7.7 Advance Mitigation Conservation Goals and Objectives

The conservation goals and objectives compiled in Table 7-3 are intended to be relevant to anticipated future SHOPP and STIP transportation project mitigation needs, be consistent with the goals and objectives of natural resource regulatory agencies for the species of mitigation need, address pressures and stressors, and support species of mitigation need population recovery and success in the GAI.

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

At the broad scale, these wildlife goals and objectives encompass large-scale ecological processes, environmental gradients, biological diversity, and regional wildlife linkages. These goals and objectives prioritize regional conservation that preserves intact habitat and provides habitat linkages and connectivity. Sub-objectives are included for each objective to guide Caltrans advance mitigation and project scoping toward those authorized actions that would create the greatest functional lift[2] or conservation benefit for the species of mitigation need in the GAI. Sub-objectives also capture specific measures from conservation and land management plans that address threats to the species of mitigation need.[3] Several of the goals are interrelated, and many objectives could apply to more than one goal; objectives were grouped with the goal to which they most specifically aligned. Goals and objectives are generally presented in order from general to more specific. They are not presented in order of importance.

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

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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 within the GAI to support ecosystem functions that are essential to recovery of the species.	See below	See below	See below
Objective WILD-1.1: Acquire, protect, restore, and/or enhance habitat of sufficient quantity to offset estimated impacts on species of mitigation need within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-1.1.1:** Identify habitat for species of mitigation need in the GAI and acquire, protect, restore, and/or enhance this habitat such that the greatest functional lift to the species of mitigation need is provided, including consolidating compensatory mitigation. **Sub-Objective WILD-1.1.2:** Prioritize key areas, such as designated critical habitat, movement corridors, and buffer zones. **Sub-Objective WILD-1.1.3:** Prioritize acquisition and/or protection of large blocks of suitable, occupied habitat for the species of mitigation need; lands adjacent to occupied habitat; and/or land that expands or buffers existing occupied protected habitats. **Sub-Objective WILD-1.1.4:** Prioritize land acquisition and/or protection that supports key populations.[c] **Sub-Objective WILD-1.1.5:** Prioritize acquisition, protection, and/or enhancement of SWAP (CDFW 2015a) conservation targets: wet mountain meadow, western upland grasslands, salt marsh, subalpine aspen forests and pine woodlands, Pacific Northwest subalpine forest, Pacific Northwest conifer forests, north coastal mixed evergreen and montane conifer forest, north coastal and montane riparian forest and woodland, mountain riparian scrub and wet meadow, montane upland deciduous scrub, chaparral, California foothill and valley forests and woodlands, 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]	▪ foothill yellow-legged frog ▪ Shasta salamander and Samwel salamander ▪ fisher	▪ *SWAP* (CDFW 2015a) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *A Status Review of the Foothill Yellow-legged Frog (*Rana boylii*) in California* (CDFW 2019c) ▪ *Species Status Assessment Report for the Shasta Salamander Complex (*Hydromantes shastae, H. samweli, *and* H. wintu*)* (FWS 2021c) ▪ *Report to the Fish and Game Commission: A Status Review of the Fisher in California* (CDFW 2015b) ▪ *Del Norte Coast Redwoods State Park Final General Plan Amendment/Environmental Impact Report Mill Creek Addition* (California State Parks 2010) ▪ *Foundation Document Redwood National and State Parks* (National Park Service 2016) ▪ *Klamath National Forest Land and Resource Management Plan* (USFS 2010) ▪ *Proposed Redding Resource Management Plan and Final Environmental Impact Statement* (BLM 1992) ▪ *Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment* (National Park Service 2017b) ▪ *Redwood State and National Parks General Management Plan* (California State Parks 1999a) ▪ *Shasta-Trinity National Forest Land and Resource Management Plan* (USFS 1995a) ▪ *Siskiyou National Forest Land and Resource Management Plan* (USFS 1989) ▪ *Six Rivers National Forest Land and Resource Management Plan* (USFS 1995b) ▪ *Smith River National Recreation Area Management Plan* (USFS 1992) ▪ *Upper Sacramento River Fisheries and Riparian Habitat Management Plan* (California Department of Fish and Game 2012) ▪ *Weaverville Joss House State Historic Park General Plan* (California State Parks 1999b) ▪ *Hayfork Community Plan* (Trinity County 1996) ▪ *Humboldt County General Plan* (Humboldt County 2017) ▪ *City of Redding General Plan* (City of Redding 2020) ▪ *Tehama County General Plan Update 2009–2029* (Tehama County 2009) ▪ *Trinity County General Plan* (Trinity County 2020) ▪ *Weaverville Community Plan* (Trinity County 2001)

Objective	Sub-Objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-2: Preserve, enhance, and increase connectivity between blocks of habitat supporting species of mitigation need to allow for dispersal that will maintain resilience and variability of populations.	See below	See below	See below
Objective WILD- 2.1: Acquire, protect, restore, and/or enhance movement corridors within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-2.1.1:** Identify movement corridors for the 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]	▪ foothill yellow-legged frog ▪ Shasta salamander and Samwel salamander ▪ fisher	▪ *SWAP* (CDFW 2015a) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *A Status Review of the Foothill Yellow-legged Frog (*Rana boylii*) in California* (CDFW 2019c) ▪ *Species Status Assessment Report for the Shasta Salamander Complex (*Hydromantes shastae, H. samweli, *and* H. wintu*)* (FWS 2021c) ▪ *Report to the Fish and Game Commission: A Status Review of the Fisher in California* (CDFW 2015b) ▪ *Del Norte Coast Redwoods State Park Final General Plan Amendment/Environmental Impact Report Mill Creek Addition* (California State Parks 2010) ▪ *Foundation Document Redwood National and State Parks* (National Park Service 2016) ▪ *Klamath National Forest Land and Resource Management Plan* (USFS 2010) ▪ *Proposed Redding Resource Management Plan and Final Environmental Impact Statement* (BLM 1992) ▪ *Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment* (National Park Service 2017b) ▪ *Redwood State and National Parks General Management Plan* (California State Parks 1999a) ▪ *Shasta-Trinity National Forest Land and Resource Management Plan* (USFS 1995a) ▪ *Siskiyou National Forest Land and Resource Management Plan* (USFS 1989) ▪ *Six Rivers National Forest Land and Resource Management Plan* (USFS 1995b) ▪ *Smith River National Recreation Area Management Plan* (USFS 1992) ▪ *Upper Sacramento River Fisheries and Riparian Habitat Management Plan* (California Department of Fish and Game 2012) ▪ *Weaverville Joss House State Historic Park General Plan* (California State Parks 1999b) ▪ *Hayfork Community Plan* (Trinity County 1996) ▪ *Humboldt County General Plan* (Humboldt County 2017) ▪ *City of Redding General Plan* (City of Redding 2019) ▪ *Tehama County General Plan Update 2009–2029* (Tehama County 2009) ▪ *Trinity County General Plan* (Trinity County 2020) ▪ *Weaverville Community Plan* (Trinity County 2001) ▪ *Habitat Connectivity for Fishers and Martens in the Klamath Basin Region of California and Oregon* (Spencer et. al. 2019)

Objective	Sub-Objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-3: Support resiliency of the landscape to climate change.	See below	See below	See below
Objective WILD-3.1: Acquire, protect, restore, and/or enhance habitat that supports resilience to climate change within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-3.1.1:** Identify, acquire, protect, restore, and/or enhance habitat critical to climate resilience for the species of mitigation need in the GAI (Figure 2-5). **Sub-Objective WILD-3.1.2:** Prioritize management of invasive species in key areas, such as movement corridors, that may be exacerbated by climate change and that would provide functional lift for the species of mitigation need.	▪ foothill yellow-legged frog ▪ Shasta salamander and Samwel salamander ▪ fisher	▪ *SWAP* (CDFW 2015a) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *A Status Review of the Foothill Yellow-legged Frog (*Rana boylii*) in California* (CDFW 2019c) ▪ *Species Status Assessment Report for the Shasta Salamander Complex (*Hydromantes shastae, H. samweli, and H. wintu*)* (FWS 2021c) ▪ *Report to the Fish and Game Commission: A Status Review of the Fisher in California* (CDFW 2015b) ▪ *Del Norte Coast Redwoods State Park Final General Plan Amendment/Environmental Impact Report Mill Creek Addition* (California State Parks 2010) ▪ *Foundation Document Redwood National and State Parks* (National Park Service 2016) ▪ *Klamath National Forest Land and Resource Management Plan* (USFS 2010) ▪ *Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment* (National Park Service 2017b) ▪ *Upper Sacramento River Fisheries and Riparian Habitat Management Plan* (California Department of Fish and Game 2012) ▪ *Humboldt County General Plan* (Humboldt County 2017) ▪ *City of Redding General Plan* (City of Redding 2019) ▪ *Tehama County General Plan Update 2009–2029* (Tehama County 2009) ▪ *Trinity County General Plan* (Trinity County 2020) ▪ *Habitat Connectivity for Fishers and Martens in the Klamath Basin Region of California and Oregon* (Spencer et. al. 2019)

Objective	Sub-Objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-4: Decrease mortality and competition, and protect population health for species of mitigation need.	See below	See below	See below
Objective WILD-4.1: Reduce impacts of invasive species on populations of species of mitigation need within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-4.1.1:** Reduce invasive species in key habitat locations and/or in areas that provide a buffer to high-value habitat for the species of mitigation need. Prioritize areas where invasive species reduction would provide the greatest functional lift to species of mitigation need and their habitat. **Sub-Objective WILD-4.1.2:** Prioritize restoration of native plant species in key areas, such as critical habitat, movement corridors, and buffer zones.	▪ foothill yellow-legged frog ▪ fisher	▪ *SWAP* (CDFW 2015a) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *A Status Review of the Foothill Yellow-legged Frog (*Rana boylii*) in California* (CDFW 2019c) ▪ *Report to the Fish and Game Commission: A Status Review of the Fisher in California* (CDFW 2015b) ▪ *Del Norte Coast Redwoods State Park Final General Plan Amendment/Environmental Impact Report Mill Creek Addition* (California State Parks 2010) ▪ *Foundation Document Redwood National and State Parks* (National Park Service 2016) ▪ *Klamath National Forest Land and Resource Management Plan* (USFS 2010) ▪ *Proposed Redding Resource Management Plan and Final Environmental Impact Statement* (BLM 1992) ▪ *Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment* (National Park Service 2017b) ▪ *Redwood State and National Parks General Management Plan* (California State Parks 1999a) ▪ *Shasta-Trinity National Forest Land and Resource Management Plan* (USFS 1995a) ▪ *Siskiyou National Forest Land and Resource Management Plan* (USFS 1989) ▪ *Six Rivers National Forest Land and Resource Management Plan* (USFS 1995b) ▪ *Smith River National Recreation Area Management Plan* (USFS 1992) ▪ *Upper Sacramento River Fisheries and Riparian Habitat Management Plan* (California Department of Fish and Game 2012) ▪ *Weaverville Joss House State Historic Park General Plan* (California State Parks 1999b) ▪ *Hayfork Community Plan* (Trinity County 1996) ▪ *Humboldt County General Plan* (Humboldt County 2017) ▪ *City of Redding General Plan* (City of Redding 2019) ▪ *Tehama County General Plan Update 2009–2029* (Tehama County 2009) ▪ *Trinity County General Plan* (Trinity County 2020) ▪ *Weaverville Community Plan* (Trinity County 2001)
Objective WILD-4.2: Reduce impacts from nonnative predators within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-4.2.1:** Identify and implement measures to reduce predation, such as designing waterways with a hydrologic regime that would discourage bullfrogs from establishing.	▪ foothill yellow-legged frog ▪ fisher	▪ *SWAP* (CDFW 2015a) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *A Status Review of the Foothill Yellow-legged Frog (*Rana boylii*) in California* (CDFW 2019c) ▪ *Report to the Fish and Game Commission: A Status Review of the Fisher in California* (CDFW 2015b) ▪ *Del Norte Coast Redwoods State Park Final General Plan Amendment/Environmental Impact Report Mill Creek Addition* (California State Parks 2010) ▪ *Foundation Document Redwood National and State Parks* (National Park Service 2016) ▪ *Klamath National Forest Land and Resource Management Plan* (USFS 2010) ▪ *Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment* (National Park Service 2017b) ▪ *Upper Sacramento River Fisheries and Riparian Habitat Management Plan* (California Department of Fish and Game 2012)
Objective WILD-4.3: Reduce road-associated mortality within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-4.3.1:** Identify locations to develop safe SHS wildlife crossing areas in the GAI and direct the species of mitigation need to them.	▪ foothill yellow-legged frog ▪ fisher	▪ *SWAP* (CDFW 2015a) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *A Status Review of the Foothill Yellow-legged Frog (*Rana boylii*) in California* (CDFW 2019c) ▪ *Report to the Fish and Game Commission: A Status Review of the Fisher in California* (CDFW 2015b) ▪ *Measures to Reduce Road Impacts on Amphibians and Reptiles in California: Best Management Practices and Technical Guidance* (Caltrans 2021h) ▪ *Habitat Connectivity for Fishers and Martens in the Klamath Basin Region of California and Oregon* (Spencer et. al. 2019)

Objective	Sub-Objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-5: Provide multi-species and multi-resource benefits.	See below	See below	See below
Objective WILD-5.1: Acquire, protect, restore, and/or enhance habitat that provides multi-species benefits within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-5.1.1:** Prioritize mitigation to provide benefits 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 within the GAI. **Sub-Objective WILD-5.1.2:** Identify SHS right-of-way areas where enhancement efforts may benefit species of mitigation need.	▪ foothill yellow-legged frog ▪ Shasta salamander and Samwel salamander ▪ fisher	▪ *SWAP* (CDFW 2015a) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *A Status Review of the Foothill Yellow-legged Frog (*Rana boylii*) in California* (CDFW 2019c) ▪ *Species Status Assessment Report for the Shasta Salamander Complex (*Hydromantes shastae, H. samweli, and H. wintu*)* (FWS 2021c) ▪ *Report to the Fish and Game Commission: A Status Review of the Fisher in California* (CDFW 2015b) ▪ *Del Norte Coast Redwoods State Park Final General Plan Amendment/Environmental Impact Report Mill Creek Addition* (California State Parks 2010) ▪ *Foundation Document Redwood National and State Parks* (National Park Service 2016) ▪ *Klamath National Forest Land and Resource Management Plan* (USFS 2010) ▪ *Proposed Redding Resource Management Plan and Final Environmental Impact Statement* (BLM 1992) ▪ *Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment* (National Park Service 2017b) ▪ *Redwood State and National Parks General Management Plan* (California State Parks 1999a) ▪ *Shasta-Trinity National Forest Land and Resource Management Plan* (USFS 1995a) ▪ *Siskiyou National Forest Land and Resource Management Plan* (USFS 1989) ▪ *Six Rivers National Forest Land and Resource Management Plan* (USFS 1995b) ▪ *Smith River National Recreation Area Management Plan* (USFS 1992) ▪ *Upper Sacramento River Fisheries and Riparian Habitat Management Plan* (California Department of Fish and Game 2012) ▪ *Weaverville Joss House State Historic Park General Plan* (California State Parks 1999b) ▪ *Hayfork Community Plan* (Trinity County 1996) ▪ *Humboldt County General Plan* (Humboldt County 2017) ▪ *City of Redding General Plan* (City of Redding 2019) ▪ *Tehama County General Plan Update 2009–2029* (Tehama County 2009) ▪ *Trinity County General Plan* (Trinity County 2020) ▪ *Weaverville Community Plan* (Trinity County 2001) ▪ *Habitat Connectivity for Fishers and Martens in the Klamath Basin Region of California and Oregon* (Spencer et. al. 2019)

[a] This column includes species of mitigation need that could benefit from these objectives.
[b] More information on these plans is provided in Chapters 3 and 4.
[c] As identified in recovery plans and other pertinent documents (see Table 7-2).

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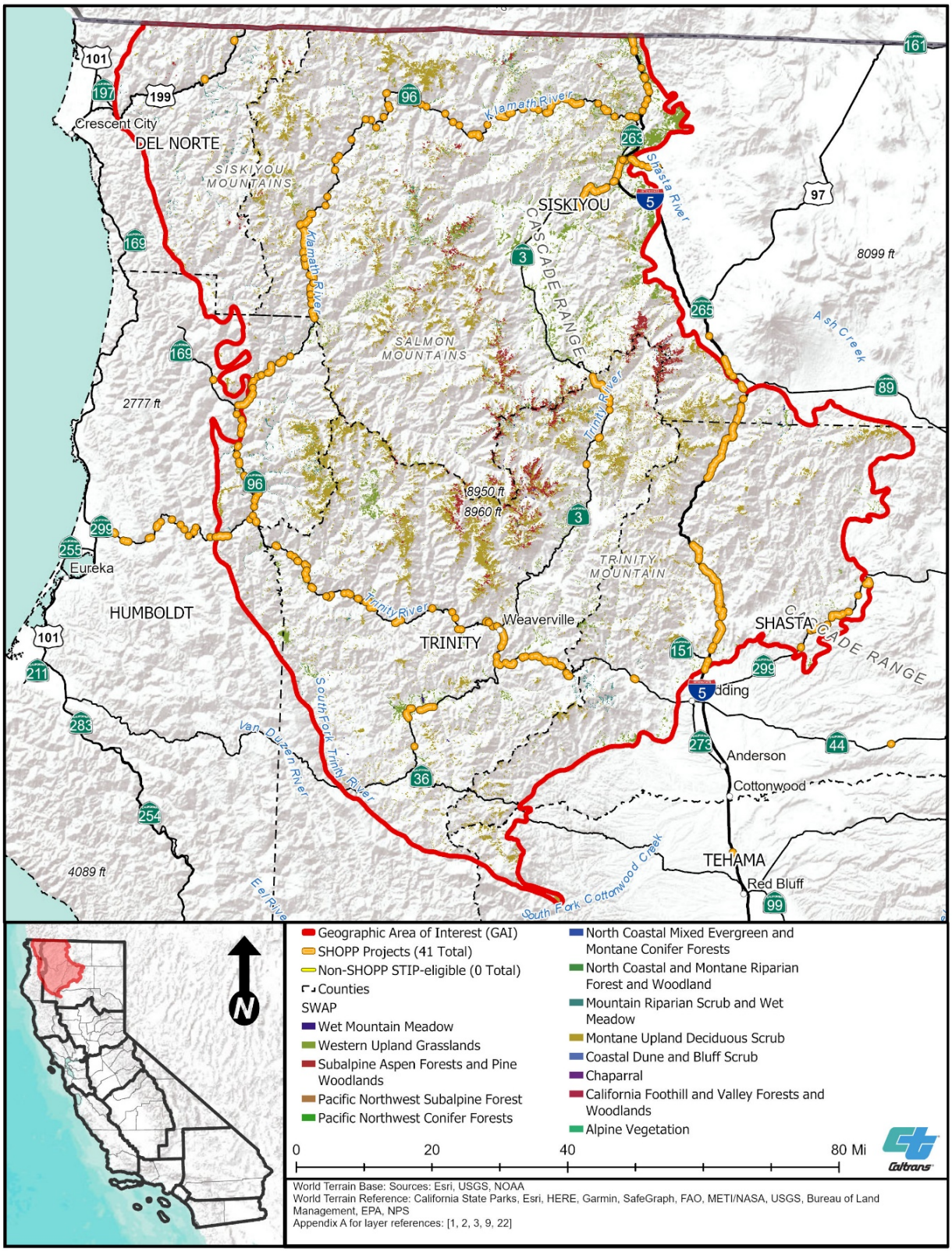
Figure 7-2. SWAP Conservation Target Habitats



7.8 Summary

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

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

Regional conservation goals and objectives provide a framework for scoping compensatory mitigation credit establishment that would successfully offset future transportation project impacts on wildlife resources by creating function lift or conservation benefits 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 within the GAI and increase connectivity between blocks of habitat. The objectives to fulfill these goals are acquisition, protection, restoration, and/or enhancement of land. Caltrans intends to prioritize efforts that provide the greatest functional lift for the species of mitigation need, and that provide a conservation benefit in terms of size, connectivity, quality, and contribution to the climate resilience of habitats within 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 and drought. Further, Caltrans anticipates that actions completed through restoration, enhancement, and/or preservation may also provide opportunities to address invasive species, predation, and road-associated mortality.

Goal WILD-3 seeks to support landscape resiliency for species of mitigation need habitat in the GAI. The primary objectives are to reduce the effects of climate change on these species by increasing the protection and functionality of land that is identified as crucial for climate resiliency, including corridors that allow these species to migrate from areas of low climate resilience into areas with higher resilience and addressing the climate change-related threat from invasive species. In addition to addressing climate change in general, these goals and objectives address habitat loss, fragmentation, and degradation, and invasive species.

Goal WILD-4 seeks to decrease mortality of species of mitigation need from known immediate and ongoing threats to individuals or populations by protecting native vegetation, reducing conditions that favor predators, and protecting species of mitigation

need from road-associated mortality. These objectives address issues related to habitat loss, fragmentation, and degradation, and threats from invasive species 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 and to provide compensatory mitigation for impacts on species of mitigation need.

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

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8. AQUATIC RESOURCES CONSERVATION GOALS AND OBJECTIVES

Caltrans' primary objective for aquatic resources is to avoid and minimize all impacts on fish, wetlands, non-wetland waters, 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 restoration and enhancement 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 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.

8.1 Approach

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

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

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

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

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

8.2 Natural Resource Regulatory Agencies with Aquatic Resources Oversight

Table 8-1 lists the natural resource regulatory agencies with the authority to condition transportation projects delivered in the GAI with aquatic resource-related compensatory mitigation. Terrestrial special-status wildlife species are known to use streams, wetlands, and other aquatic resources that are regulated by federal and state agencies specific to those habitat types. This RAMNA identifies goals and objectives for terrestrial species separately in Chapter 7, *Wildlife Resources Conservation Goals and Objectives*.

Table 8-1. Agencies with Jurisdiction over Aquatic Resources

Agency	Summary
CDFW	CDFW oversees the conservation, protection, and management of fish, wildlife, native plants, and the habitats necessary for biologically sustainable populations of those species in California. California law (FGC § 1602) also requires an entity to notify CDFW prior to commencing any activity that may substantially divert or obstruct the natural flow of any river, stream, or lake; substantially change or use any material from the bed, channel, or bank of any river, stream, or lake; or deposit or dispose of debris, waste, or other materials containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. CDFW issues agreements to project proponents under its authorities, including Lake and Streambed Alteration Agreements, approvals of conservation and mitigation banks, approvals of MCAs and RCISs, and NCCP permits. Under CESA, CDFW also has authority to issue incidental take permits for state-listed fish species. Additionally, CDFW's Environmental Review and Permitting, Conservation and Mitigation Banking, NCCP, and RCIS programs implement sections of the FGC, 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. In accordance with the 2008 mitigation rule, in general it is the preference of the Corps to use the following order of priority for mitigation: mitigation bank, in-lieu fee program, on-site permittee-responsible mitigation, and off-site permittee-responsible mitigation, but the preference may change based on what is environmentally preferable.
EPA	EPA has authority under the CWA (33 USC § 11251–1357) to restore and maintain the chemical, physical, and biological integrity of the nation's waters. EPA and 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 ESA. Most statutes give FWS an advisory role in mitigation. However, if a non-federal entity applies for an incidental take permit for a listed animal species, Section 10(a)(2)(b) of the ESA requires that the impact of any incidental take be minimized and mitigated to the maximum extent practicable. Section 7(a)(1) of the ESA also requires all federal agencies to use their authorities to conserve listed species. Many federal agencies have developed programs to include mitigation as part of the Section 7(a)(2) consultation on their proposed actions to partially fulfill this Congressional mandate. Conservation banking can assist federal and non-federal participants in the Section 7 and Section 10 process. In May 2003, FWS issued comprehensive federal guidelines designed to promote conservation banks as a tool for mitigating adverse impacts on species; the guidelines foster national consistency by standardizing establishment and operational criteria. Many activities conducted under Section 7 and Section 10 of the ESA result in adverse effects on listed species, including habitat loss or modification. One way to offset these types of impacts is to include in the project design a plan that involves the restoration and/or protection of similar habitat on site and/or off site. Purchasing credits in conservation banks is one method of protecting habitat on site or off site.
NMFS	NMFS has jurisdiction over marine species listed as threatened or endangered under the ESA. Federal agencies must consult with NMFS to ensure that their actions do not jeopardize the continued existence of ESA listed species or result in the destruction or adverse modification of designated critical habitat. NMFS also manages and conserves wildlife and fisheries resources in the marine and estuarine environment under the Magnuson-Stevens Fishery Conservation and Management Act. Federal agencies must consult with NMFS on any action that might adversely affect EFH. NMFS will advise federal agencies to avoid, minimize, mitigate, or otherwise offset adverse effects on EFH. Magnuson-Stevens Fishery Conservation and Management Act EFH consultation can be done in tandem with ESA consultation. NMFS protects marine mammals under the Marine Mammal Protection Act, with the exception of sea otters, walruses, manatees, and polar bears, which are managed by FWS. With some exceptions, the Marine Mammal Protection Act prohibits the take of marine mammals, including harassment, hunting, capturing, collecting, or killing, in U.S. waters and by U.S. citizens on the high seas.
SWRCB and RWQCBs	The Porter-Cologne Act governs water quality regulation in California and gives SWRCB and the RWQCBs the authority to condition projects, through waste discharge requirements, to protect water quality and the beneficial uses of waters of the state, as identified in Basin Plans. Basin Plans, adopted by the RWQCBs, incorporate the beneficial use designation of surface waters of the state and must take into consideration the use and value of water for protection and propagation of fish, shellfish, and wildlife. SWRCB and the RWQCBs have been delegated the responsibility of implementing CWA Section 401, which regulates the discharge of pollutants into WOTUS. SWRCB and the RWQCBs may determine that compensatory mitigation is necessary to offset unavoidable impacts on aquatic resources. Compensatory mitigation can be achieved through the purchase of credits, as outlined in the *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (SWRCB, adopted 2019). Projects that occur in one region are regulated by that regional board, whereas projects that cross regions are regulated by SWRCB.

8.3 Aquatic Resources

An overview of aquatic resources was provided in Chapter 2, *Environmental Setting*, and is summarized below. The GAI overlaps, in part or in whole, with the HUC-8 boundaries listed in Table 8-2. Additionally, the Applegate, Cottonwood Creek, Cow Creek, Illinois, McCloud, and Salmon HUC-8s also partially or wholly occur in the GAI.

8.3.1. Wetlands and Non-wetland Waters

In the GAI, the major stream systems include the Sacramento and Trinity Rivers (Central Valley RWQCB 2019; North Coast RWQCB 2018). Although not named in RWQCB Basin Plans of the GAI, the Klamath and Smith Rivers could also be considered major stream systems given their length and number of tributaries. 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 Cascade Range and Coast Range Mountains (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 158,124 acres of aquatic habitat, consisting of 26 wetland and non-wetland waters habitats listed in Table 2-5 (Caltrans 2021e, 2021f). Nine beneficial uses that support the preservation and enhancement of wildlife habitat and aquatic resources in the GAI also align with the AMP's objective to contribute to an improved environmental outcome through transportation project mitigation and are relevant to this RAMNA (Table 2-4).

8.3.2. Riparian Habitat

Riparian habitat is discussed in Section 2.17. Because no detailed riparian GIS layer is currently available, riparian habitat information was excerpted from the SAMNA's vegetation layer. The riparian habitats identified in the GAI are montane riparian, valley foothill riparian, and riverine (Table 2-2).

8.3.3. Special-status Fish Species of Mitigation Need

Special-status fish species are identified in Section 2.16.2 and their SAMNA results are provided in Section 5.3.1. Based on SAMNA results and historical mitigation needs, no fish species were identified as species of mitigation need for this RAMNA; that is, based on this RAMNA, fish species benefits will not be an advance mitigation project's primary objective (Section 1.6.3). Nevertheless, it is expected that a fish species could co-benefit from some advance mitigation projects.

8.4 Regional Conservation Efforts

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

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

Clear Creek-Sacramento River HUC-8 18020154	Lower Klamath HUC-8 18010209	Lower Pit HUC-8 18020003	Sacramento Headwaters HUC-8 18020005	Scott HUC-8 18010208
▪ Clear Creek ▪ Cottonwood Creek ▪ Middle Creek ▪ Whiskeytown Lake	▪ Klamath River	▪ Nelson Creek[a] ▪ Squaw Creek[b]	▪ Big Springs Creek ▪ Nelson Creek[a] ▪ Squaw Creek[b]	▪ Duzel Creek ▪ Noyes Valley Creek
Shasta HUC-8 18010207	**Smith HUC-8 18010101**	**South Fork Trinity HUC-8 18010212**	**Trinity HUC-8 18010211**	**Upper Klamath HUC-8 18010206**
▪ Shasta River	▪ Mill Creek[c] ▪ Rattlesnake Lake ▪ Smith River	▪ Hayfork Creek ▪ South Fork Trinity River	▪ Nelson Creek[a] ▪ New River ▪ Sidney Gulch ▪ Trinity River ▪ Weaver Creek	▪ Klamath River

[a] It is unclear which Nelson Creek the Ecological Restoration Implementation Plan refers to.
[b] Squaw Creek could be in either HUC-8, according to the Shasta-Trinity National Forest plan.
[c] Although multiple Mill Creeks are in the GAI, the *Foundation Document Redwood National and State Parks* refers to the one in the Smith HUC-8.

8.5 Pressures and Stressors

Pressures and stressors refer to environmental trends or physical, chemical, or biological factors or conditions that affect aquatic resources. According to the SWAP (CDFW 2015a), a pressure is defined as "an anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of the target. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target is likely to be significant." Additionally, stress is defined in the SWAP as "[a] degraded ecological condition of a target that resulted directly[2] or indirectly from negative impacts of pressures (e.g., habitat fragmentation)" (CDFW 2015a). The Corps defines human stressors as human-caused sources of disturbance in an ecosystem, such as roads, urban areas, and agricultural lands (Corps 2015).

The documents in Table 8-3 identify multiple pressures and stressors on aquatic resources in the GAI where hydrology, land use and management, and climate intersect. These pressures and stressors were evaluated in relation to the types of direct and indirect effects that could result from transportation projects funded through SHOPP and could benefit from in-kind mitigation purchased or established through an advance mitigation project.

8.5.1. Habitat Loss, Fragmentation, and Degradation

Urbanization and other anthropogenic factors such as roads, poor grazing practices, and habitat invasion by nonnative species have led to the loss and degradation of aquatic resources. Additionally, the expansion of roads and urbanization have resulted in habitat fragmentation and a decrease in connectivity between habitats that support different life stages and have contributed to nonpoint source pollution from chemicals and toxins. Roads have also affected local hydrological conditions by changing sheet flow and altering water movement in drainages (CDFW 2015a, 2016a). In the GAI, urbanization and development are minimal and are primarily limited to the areas along Interstate 5 and State Routes 3, 36, 44, and 96 (Figure 2-6).

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

Table 8-3. Documents Identifying Aquatic Resource Goals and Objectives in the GAI

Document	Reference	Information Identified
Policies, Procedures, Guidelines, and Water Quality Plans	See below	See below
2008 Final Compensatory Mitigation Rule	73 *Federal Register* 19593	Corps' ruling to establish standards and criteria for the use of all types of compensatory mitigation, including on-site and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts on WOTUS. Recognizes that consolidating mitigation may be environmentally preferable for linear projects (because advance or at least concurrent compensatory mitigation is environmentally preferable but not always possible to achieve) (Preamble and 33 Section 332.3).
303(d) List of Impaired Water Bodies	SWRCB 2021	Section 303(d) of the CWA requires that every 2 years, each state submit to EPA a list of rivers, lakes, and reservoirs in the state for which pollution control or requirements have failed to provide for water quality. Based on a review of this list and its associated Total Maximum Daily Load Priority Schedule (Appendix F in this document), 14 waterbodies are listed as impaired in the GAI. Of the 14, 7 have an established TMDL.
California Wetlands Conservation Policy	Executive Order W-59-93	The "No Net Loss Policy" for wetlands aims to "[e]nsure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship and respect for private property."
National Wetlands Mitigation Action Plan	EPA and Corps 2002	An EPA and Corps comprehensive, interagency document to further achievement of the goal of no net loss of wetlands. The goals and objectives of the *National Wetlands Mitigation Action Plan* were incorporated into the 2008 Final Compensatory Mitigation Rule, which was updated in 2015 and includes the no net loss policy.
Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division	Corps 2015	Provides guidelines for compensatory mitigation site selection. A watershed approach should be used when selecting sites to establish compensatory mitigation.
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	SWRCB 2019	Creates a State of California wetland definition, a framework for determining jurisdiction of state wetlands, wetland delineation procedures, and application procedures for discharges of dredge and fill material to waters of the state.
Water Quality Control Plan for the Central Valley Basin	Central Valley RWQCB 2019	Identifies water quality objectives and beneficial uses for the Sacramento River Basin.

Document	Reference	Information Identified
Water Quality Control Plan for the North Coast Region	North Coast RWQCB 2018	Identifies water quality objectives and beneficial uses for the Klamath River and North Coastal Basins.
Conservation and Land Management Documents	See below	See below
Ecological Restoration Implementation Plan	USFS 2013	Includes a goal for the Shasta-Trinity National Forest to restore 0.1 mile of riparian willow vegetation along Nelson Creek.
Foundation Document Redwood National and State Parks	NPS 2016	Identifies goals for the restoration for degraded watersheds, forests, and streams in the Redwood National Park expansion area and all of the Mill Creek watershed in Del Norte Coast Redwoods State Park.
Klamath National Forest Land and Resource Management Plan	USFS 2010	A riparian reserve management area occurs in the GAI. This area includes a goal to restore intermittent streams, in part by planting willows.
North Coast Resource Partnership Plan	North Coast Resource Partnership 2020	Includes goals to improve water quality in the plan area and enhance and/or restore aquatic ecosystems, in particular coastal wetlands and streams inhabited by salmonids.
Proposed Redding Resource Management Plan and Final Environmental Impact Statement	BLM 1992	Includes goals for the Klamath Management Area to restore riparian vegetation in the Shasta and Klamath Rivers, enhance wetlands in the Shasta Valley, and improve water quality in the Shasta River basin. The plan includes objectives for the improvement of riparian habitat of Duzel and upper Noyes Valley Creeks. In addition, the plan includes objectives for restoring riparian vegetation and riparian zones within the Shasta River, Shasta River Canyon, Klamath River (Upper and Mid), Trinity River, and Clear Creek. The plan also supports the enhancement of native fisheries of Big Springs Creek and Shasta River and its tributaries.
Redwood State and National Parks General Management Plan	California State Parks 1999a	Establishes goals for the weed treatment of 9.5 miles along roads per year for watershed restoration.
Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment	NPS 2017b	Identifies Himalayan blackberry as a priority for removal from Redwood National Park.

Document	Reference	Information Identified
Rogue River National Forest Land and Resource Management Plan	USFS 1990	Includes general goals to enhance riparian habitat and watersheds.
Shasta County General Plan	Shasta County 2004	Includes a goal to restore Middle Creek, Clear Creek, and other tributaries to the Sacramento River.
Shasta-Trinity National Forest Land and Resource Management Plan	USFS 1995a	Includes goals to enhance Squaw and Hayfork Creeks, increase riparian habitat along New River, and enhance the water quality of tributaries to the South Fork Trinity River, tributaries to Cottonwood Creek, and Hayfork Creek.
Siskiyou National Forest Land and Resource Management Plan	USFS 1989	The plan includes general goals to improve riparian habitat, fish habitat, and watersheds. There are also goals for the enhancement of salmonid fish habitat in riparian management areas.
Six Rivers National Forest Land and Resource Management Plan	USFS 1995b	Contains guidelines that prioritize the Smith River, Klamath River tributaries, and Trinity River tributaries for restoration.
Smith River National Recreation Area Management Plan	USFS 1992	Contains goals to restore designated streamside protection zones of classified river corridors. Identifies sites for restoration along the river including near the Cal-Nickel site on Gasquet Mountain, Holiday Mine, Tyson Mine, Alta Mine, Union Mine, and Copper Creek Mine. Identifies areas to stabilize landslides and restore damaged riparian areas, including Rattlesnake Slide, Slip n' Slide, Dry Lake, Big Toe, and Rib Slide. Contains goals to restore designated streamside protection zones of classified river corridors, and to restore and enhance Rattlesnake Lake and associated meadows, springs, and waterholes.
SWAP	CDFW 2015a	Aquatic species targets for the North Coast area include 7 invertebrates such as vernal pool tadpole shrimp and conservancy fairy shrimp and 21 fish such as river lamprey, coho salmon, Gualala roach, and reticulate sculpin.
Weaverville Joss House State Historic Park General Plan	California State Parks 1999b	Includes goals for removal of black locust trees and restoration of Sidney Gulch and Weaver Creek.
Whiskeytown National Recreation Area Foundation Document	NPS 2014	Contains goals for the ongoing restoration of Whiskeytown Lake and its tributaries.

8.5.2. Invasive Species

Transportation projects and associated ongoing maintenance activities have the potential to introduce and/or spread nonnative, invasive species. When nonnative, invasive species enter an ecosystem, they can disrupt the natural balance, resulting in lower biodiversity, degradation of habitats, alteration of native genetic diversity, shifting of wetland type, disruption of aquatic and terrestrial connectivity, and further threats to already endangered or threatened natural resources. Invasive plant species that affect riparian systems in the GAI include giant reed, water hyacinth, Himalayan blackberry, tree of heaven, hydrilla, and perennial pepperweed (Cal-IPC 2022; CDFW 2015a). Invasive wildlife species that affect riparian systems in the GAI include nutria, smallmouth bass, yellow perch, brown trout, brook trout, and American bullfrog (CDFW 2015a). Invasive mussel species that have the potential to affect non-wetland waters in the GAI include New Zealand mud snails (*Potamopyrgus antipodarum*), quagga mussels (*Dreissena bugensis*), and zebra mussels (*Dreissena polymorpha*) (Benson et al. 2023; CDFW 2023). However, quagga mussels and zebra mussels have not been observed in the GAI.

8.5.3. Altered Hydrology, Geomorphology, and Water Quality

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

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 greater minimum and maximum temperature changes over time, more frequent drought periods, heavier intermittent rainfall, and an increased risk of wildfire (Caltrans 2018b). Climate change is expected to amplify the pattern of wet high river flows in the winter and dry low river flows in the summer, which could contribute to water quality degradation through increased sedimentation and elevation of temperature in summer months attributable to lower-than-average flows (Grantham 2018).

8.5.5. Wildfire Risk

Vegetation can be altered by large-scale wildfire effects by altering microclimatic regimes, increasing runoff and river discharge, and enhancing erosion and sediment inputs,

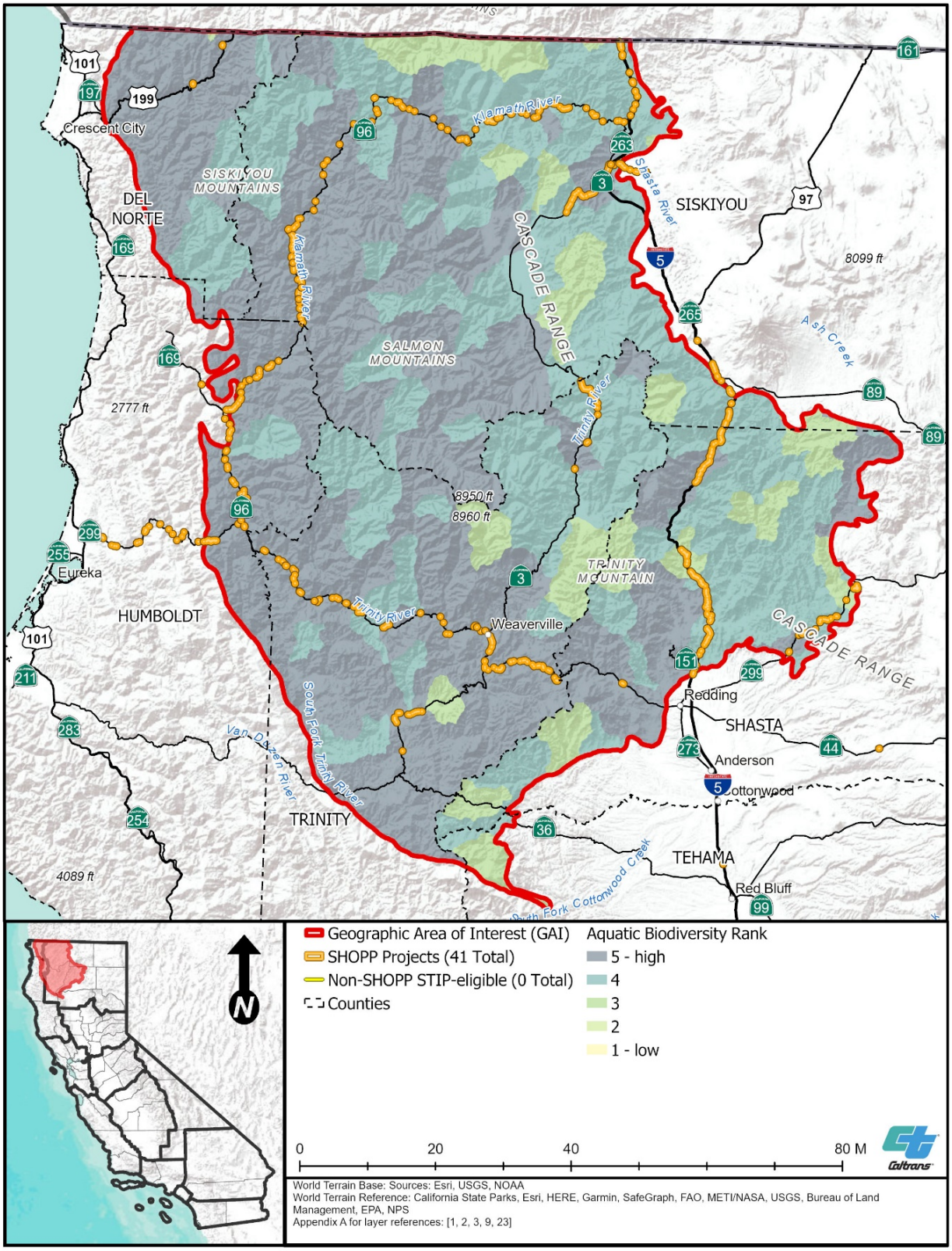
transport, and deposition. Fires can also affect the physical characteristics of riparian and wetland ecosystems by transitioning vegetation from aquatic and riparian areas to uplands (Bixby et al. 2015). Fire in riparian zones can reduce canopy cover, resulting in increased water temperatures (CDFW 2015a).

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.
- 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 bull trout (*Salvelinus confluentus*) and longfin smelt (*Spirinchus thaleichthys*), as well as other species that use aquatic habitat such as Pickering's ivesia (*Ivesia pickeringii*).
- Enhancing and/or restoring the aquatic resources of the GAI is expected to support or contribute to beneficial uses of wetland and non-wetland waters of the GAI. For example, enhancement and/or restoration of wetlands adjacent to wildlife habitat would likely improve wildlife habitat water quality. Further, enhancement and/or restoration of wetlands adjacent to GAI waters could sequester contaminants in waters identified as 303(d) impaired and/or with an established TMDL.

Figure 8-1. Aquatic Biodiversity of the GAI



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

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 objectives; objectives are more specific, measurable, achievable, relevant, and time-bound measures that align to a desired result specified by a goal. At the broad scale, these aquatic resources goals and objectives encompass ecological processes, address functions and values of aquatic systems, and prioritize regional conservation that preserves intact aquatic resources, restores aquatic function, and supports climate change planning.

Sub-objectives are included for each objective to guide Caltrans' advance mitigation scoping toward those actions that would create the greatest functional lift or conservation benefit, support long-term preservation, restore surface water flows, protect and restore hydrologic processes such as channel stability, and reduce climate change effects on aquatic resources in the GAI. Sub-objectives also capture specific measures from conservation and land management plans that address threats to aquatic resources. Several of the goals are interrelated, and many objectives could apply to more than one goal; objectives were grouped with the goal to which they most specifically aligned. Goals and objectives are generally presented in order from general to more specific.

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

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

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
Goal AR-1: No net loss 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 GAI, particularly the Klamath, Smith, and Trinity 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.	▪ *2008 Final Compensatory Mitigation Rule* (73 *Federal Register* 19593) ▪ *California Wetlands Conservation Policy* (Executive Order W-59-93) ▪ *Eagle Lake Field Office Proposed Resource Management Plan and Final Environmental Impact Statement* (BLM 2007) ▪ *Ecological Restoration Implementation Plan* (USFS 2013) ▪ *Foundation Document Redwood National and State Parks* (NPS 2016) ▪ *Klamath National Forest Land and Resource Management Plan* (USFS 2010) ▪ *National Wetlands Mitigation Action Plan* (EPA and Corps 2002) ▪ *North Coast Resource Partnership* (North Coast Resource Partnership 2020) ▪ *Proposed Redding Resource Management Plan and Final Environmental Impact Statement* (BLM 1992) ▪ *Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division* (Corps 2015) ▪ *Rogue River National Forest Land and Resource Management Plan* (USFS 1990) ▪ *Shasta County General Plan* (Shasta County 2004) ▪ *Shasta-Trinity National Forest Land and Resource Management Plan* (USFS 1995a) ▪ *Siskiyou National Forest Land and Resource Management Plan* (USFS 1989) ▪ *Six Rivers National Forest Land and Resource Management Plan* (USFS 1995b) ▪ *Smith River National Recreation Area Management Plan* (USFS 1992) ▪ *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material in Waters of the State* (SWRCB 2019) ▪ *SWAP* (CDFW 2015a) ▪ *Weaverville Joss House State Historic Park General Plan* (California State Parks 1999b) ▪ Whiskeytown National Recreation Area Foundation Document (NPS 2014)
Objective AR-1.2: Avoid a net loss of aquatic resource acreage by establishing aquatic resources.	**Sub-Objective AR-1.2.1:** Establish and/or reestablish wetland and non-wetland waters, particularly in key wetland and non-wetland water habitats that are identified in the SWAP, FWS recovery plans, 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 Klamath, Smith, and Trinity Rivers and in other named and unnamed streams, many of which are listed in Table 8-2.	Same references as listed with Objective AR-1.1.

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
Goal AR-2: Restore and maintain the chemical, physical, and biological integrity of wetlands and non-wetland waters.	See below	See below
Objective AR-2.1: Restore and/or enhance water quality.	**Sub-Objective AR-2.1.1:** In coordination with the RWQCB, restore and/or enhance wetland and non-wetland waters with RWQCB biology-related beneficial use designations such as cold freshwater habitat; commercial and sport fishing; freshwater replenishment; groundwater recharge; migration of aquatic organisms; rare, threatened, or endangered species; spawning, reproduction, and/or early development; warm freshwater habitat; and wildlife habitat. **Sub-Objective AR-2.1.2:** In coordination with natural resource regulatory agencies, address aggradation, erosion, nutrients, contaminants, sedimentation, and temperatures in the HUC-8s identified in Table 8-2. **Sub-Objective AR-2.1.3:** In coordination with the RWQCB, implement restoration and enhancement actions that address water quality for aquatic resources, such as the South Fork Trinity River. **Sub-Objective AR-2.1.4:** Restore or create riparian floodplain habitat, adjacent wetlands, and adjacent non-wetland aquatic features to enhance water quality in tributaries and downstream systems. **Sub-Objective AR-2.1.5:** Rehabilitate and/or enhance small streams and sections of larger streams by removing nonnative plant species that degrade stream water quality, such as giant reed, black locust, water hyacinth, Himalayan blackberry, tree of heaven, hydrilla, and perennial pepperweed. **Sub-Objective AR-2.1.6:** Improve stream temperatures by increasing shaded riverine aquatic habitat in the Klamath, Smith, and Trinity Rivers for fish and other aquatic life.	▪ *303(d) List of Impaired Water Bodies* (SWRCB 2021) ▪ *Foundation Document Redwood National and State Parks* (NPS 2016) ▪ *North Coast Resource Partnership* (North Coast Resource Partnership 2020) ▪ *Proposed Redding Resource Management Plan and Final Environmental Impact Statement* (BLM 1992) ▪ *Redwood State and National Parks General Management Plan* (California State Parks 1999a) ▪ *Redwood National Park/Santa Monica Mountains National Recreation Area Invasive Plant Management Plan Environmental Assessment* (NPS 2017b) ▪ *Shasta-Trinity National Forest Land and Resource Management Plan* (USFS 1995a) ▪ *Six Rivers National Forest Land and Resource Management Plan* (USFS 1995b) ▪ *Water Quality Control Plan for the Central Valley Basin* (Central Valley RWQCB 2019) ▪ *Water Quality Control Plan for the North Coast Region* (North Coast 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 Klamath, Smith, and Trinity 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, freshwater pond, lake, and riverine habitats.	Same references as listed with Objective AR-2.1.
Objective AR-2.3: Improve water storage and groundwater recharge.	**Sub-Objective AR-2.3.1:** Promote restoration of stream and riparian areas' natural functions to provide water storage and release. **Sub-Objective AR-2.3.2:** Reduce excessive and invasive vegetation along stream/riparian corridors to lower vegetative transpiration rates to sustainable levels and increase water storage in soils and streams. **Sub-Objective AR-2.3.3:** Create or restore wetlands adjacent to streams to enhance groundwater-surface water dynamics in tributaries.	Same references as listed with Objective AR-2.1.

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
Goal AR-3: Support resiliency of aquatic resources to climate change.	See below	See below
Objective AR-3.1: Reduce impacts from climate change.	**Sub-Objective AR-3.1.1:** Enhance and/or restore aquatic resource function and value in areas of lower climate resilience, such as the central portion of the GAI, to reduce climate change effects on aquatic resources. **Sub-Objective AR-3.1.2:** Prioritize enhancement and/or restoration that will increase resilience to climate change, such as aquatic features with hydrologic connections to the Klamath, Smith, and Trinity Rivers, such that the potential for aquatic resource migration increases. **Sub-Objective AR-3.1.3:** 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-3.1.4:** Enhance, rehabilitate, establish and/or reestablish aquatic habitats by using native species such as Fremont cottonwood (*Populus fremontii*), western sycamore (*Platanus racemosa*), willows (*Salix* spp.), cattails (*Typha* spp.), rushes (*Juncus* spp.), and bulrushes (*Schoenoplectus* spp.) to reduce the effects of climate change. **Sub-Objective AR-3.1.5:** Reduce adverse instream flooding effects by restoring affected headwater and tributary hydrological functions for the Klamath, Smith, and Trinity Rivers. **Sub-Objective AR-3.1.6:** Prioritize habitat establishment and reestablishment in areas that can also reduce risk in floodprone systems, in particular areas along the Klamath, Smith, and Trinity Rivers.	▪ *Eagle Lake Field Office Proposed Resource Management Plan and Final Environmental Impact Statement* (BLM 2007) ▪ *Ecological Restoration Implementation Plan* (USFS 2013) ▪ *Foundation Document Redwood National and State Parks* (NPS 2016) ▪ *Klamath National Forest Land and Resource Management Plan* (USFS 2010) ▪ *North Coast Resource Partnership* (North Coast Resource Partnership 2020) ▪ *Proposed Redding Resource Management Plan and Final Environmental Impact Statement* (BLM 1992) ▪ *Rogue River National Forest Land and Resource Management Plan* (USFS 1990) ▪ *Shasta County General Plan* (Shasta County 2004) ▪ *Shasta-Trinity National Forest Land and Resource Management Plan* (USFS 1995a) ▪ *Siskiyou National Forest Land and Resource Management Plan* (USFS 1989) ▪ *Six Rivers National Forest Land and Resource Management Plan* (USFS 1995b) ▪ *Smith River National Recreation Area Management Plan* (USFS 1992) ▪ *SWAP* (CDFW 2015a) ▪ *Weaverville Joss House State Historic Park General Plan* (California State Parks 1999b) ▪ *Whiskeytown National Recreation Area Foundation Document* (NPS 2014)
Objective AR-3.2: Improve aquatic habitat resiliency.	**Sub-Objective AR-3.2.1:** Promote native plant species that can stabilize banks, improve filtering of nutrient loads from water, and maintain the flood conveyance properties of streams and estuaries, such as rushes, bulrushes, cattail, and willows. **Sub-Objective AR-3.2.2:** Prioritize management of invasive species that occur in large contiguous areas in aquatic habitats, such as giant reed, water hyacinth, black locust, Himalayan blackberry, tree of heaven, hydrilla, and perennial pepperweed that may be exacerbated by climate change such that the greatest functional lift is provided. **Sub-Objective AR-3.2.3:** Enhance and/or restore small (that is, low order) tributaries/streams that discharge into larger rivers such as the Klamath, Smith, and Trinity Rivers.	Same references as listed with Objective AR-3.1.

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-3
Goal AR-4: Provide multi-resource benefits.	See below	See below
Objective AR-4.1: Maximize mitigation opportunities for multiple environmental benefits.	**Sub-Objective AR-4.1.1:** Enhance, rehabilitate, establish and/or reestablish aquatic resource areas currently occupied by, or that provide habitat for, one or more special-status species, or areas that contribute to the protection of ecologically, geographically, and/or genetically distinct populations or sub-populations of obligate aquatic special-status species. **Sub-Objective AR-4.1.2:** Enhance and/or restore habitats for other aquatic species such as vernal pool crustaceans and plants, fish species included in Section 2.16.2, as well as species included in Appendix D of this document that could benefit from aquatic habitat enhancement and/or restoration. **Sub-Objective AR-4.1.3:** Address additional RWQCB beneficial use designations, such as recreation (for example, bird watching), through enhancement, rehabilitation, establishment, and/or reestablishment actions.	▪ *Proposed Redding Resource Management Plan and Final Environmental Impact Statement* (BLM 1992) ▪ *Redwood State and National Parks General Management Plan* (California State Parks 1999a) ▪ *Siskiyou National Forest Land and Resource Management Plan* (USFS 1989) ▪ *SWAP* (CDFW 2015a)

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.

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

Regional conservation goals and objectives provide a framework for scoping mitigation credit establishment that would likely successfully offset future transportation project impacts on aquatic resources by creating functional lift or conservation benefits, 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 support climate resiliency for aquatic resources in the GAI. The primary objectives are to reduce impacts on aquatic resources from climate change and to improve aquatic habitat climate resiliency. The sub-objectives were selected to address the following pressures and stressors: climate change and drought, invasive species, and wildfire risk.

Goal AR-4 seeks to guide advance mitigation project scoping to prioritize multi-resource benefits, with the only objective being to coordinate mitigation efforts for multi-resource benefits. The sub-objectives of Goal AR-4 describe what additional benefits exist for other resources in the GAI, including benefits to upland terrestrial habitat. Goal AR-4 was developed to include conservation for multiple resources while seeking to address 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 2 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 2 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 be 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(ies) goals and objectives
Yield mitigation in units and terms approved by natural resource regulatory agencies with the authority to condition transportation project permits with compensatory mitigation
Employ, as appropriate, existing applicable state and federal standards and instruments, mitigation-related agreements, advance mitigation project-specific agreements,[b,c] and contracts with qualified third parties[d]
Address overlapping mitigation requirements
Implement the state's competitive proposal and bidding processes[d]
Strategically exercise the AMA
Manage the financial, technical, and strategic risks associated with Caltrans' investments

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

Table 9-2. Summary of Conservation-related Advance Mitigation Project Scope Goals and Objectives

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

9.2 Benefiting Transportation Project Needs Summary

The proximity of planned SHOPP transportation projects to natural resources is shown on figures throughout this document. Estimated transportation project mitigation needs within the GAI for fiscal years 2021/22 to 2030/31 are presented in Chapter 5, *Modeled Estimated Impacts*, and the timing of the needs is analyzed in Chapter 6, *Benefiting Transportation Project Considerations*. For the time interval under consideration, fiscal years 2021/22 to 2030/31, Caltrans District 2 intends to prioritize purchasing or developing mitigation credits or values that address the Road Repair and Accountability Act of 2017 (also known as Senate Bill 1) priorities and that are planned for the middle and end of the planning period. Hence, given the expected timing of mitigation need, at this time (February of fiscal year 2022/23) mitigation that can be purchased or established by fiscal year 2024/25 (within the next 2 years) could potentially address approximately:

- 55.8 acres of foothill yellow-legged frog habitat, 4.4 acres of Shasta salamander habitat, and 23.9 acres of fisher habitat impacts, potentially contributing to the acceleration of 38, 5, and 29 transportation projects, respectively
- 1.0 acre of fish habitat and 0.8 acre of non-wetland waters impacts in the Clear Creek-Sacramento River Sub-basin, potentially contributing to the acceleration of 2 transportation projects
- 0.4 acre of wetland and <0.1 acre of non-wetland waters impacts in the Cow Creek Sub-basin, potentially contributing to the acceleration of 2 and 1 transportation projects, respectively

- 0.9 acre of fish habitat, <0.1 acre of wetland, 0.9 acre of non-wetland waters, and 0.3 acre of riparian habitat impacts in the Lower Klamath Sub-basin, potentially contributing to the acceleration of 9, 1, 5, and 2 transportation projects, respectively
- 0.3 acre of fish habitat, 0.1 acre of wetland, and 0.3 acre of non-wetland waters impacts in the Lower Pit Sub-basin, potentially contributing to the acceleration of 2, 1, and 2 transportation projects, respectively
- 0.5 acre of fish habitat and 0.5 acre of non-wetland waters impacts in the McCloud Sub-basin, potentially contributing to the acceleration of 1 transportation project
- <0.1 acre of wetland, 2.5 acres of non-wetland waters, and 0.4 acre of riparian habitat impacts in the Sacramento Headwaters Sub-basin, potentially contributing to the acceleration of 3, 5, and 2 transportation projects, respectively
- 0.2 acre of riparian habitat impacts in the Salmon Sub-basin, potentially contributing to the acceleration of 1 transportation project
- <0.1 acre of wetland, 0.2 acre of non-wetland waters, and <0.1 acre of riparian habitat impacts in the Scott Sub-basin, potentially contributing to the acceleration of 1, 2, and 1 transportation projects, respectively
- 0.1 acre of wetland and 0.2 acre of non-wetland waters impacts in the Shasta Sub-basin, potentially contributing to the acceleration 2 and 3 transportation projects, respectively
- <0.1 acre of non-wetland waters impacts in the Smith Sub-basin, potentially contributing to the acceleration 2 transportation projects
- 0.1 acre of wetlands and 0.1 acre of non-wetland waters impacts in the South Fork Trinity Sub-basin, potentially contributing to the acceleration 1 transportation project
- 0.2 acre of wetland, 2.1 acres of non-wetland waters, and 1.0 acre of riparian habitat impacts in the Trinity Sub-basin, potentially contributing to the acceleration of 3, 11, and 1 transportation projects, respectively
- 0.3 acre of wetland, 2.4 acres of non-wetland waters, and 0.2 acre of riparian habitat impacts in the Upper Klamath Sub-basin, potentially contributing to the acceleration of 3, 3, and 1 transportation projects, respectively

All or some of these needs could form the basis for Caltrans District 2 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).

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[e] lands, waterways, aquatic resources, or fisheries, or funds the acquisition, restoration, management, monitoring, enhancement, and preservation of lands, waterways, aquatic resources, or fisheries, that would measurably advance a conservation objective specified in an RCIS if the department concludes that the action or actions could conserve or create environmental values that are appropriate to mitigate the anticipated potential impacts of planned transportation improvements.	SHC § 800.6(a)(3)(B)	9.3.10
When the other mitigation options (above) are not practicable, Caltrans may perform mitigation in accordance with a programmatic mitigation plan[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 and the RWQCBs do not typically approve establishment of or accept preservation credits.
[f] Programmatic mitigation plans are defined in 23 USC § 169(a) (SHC § 800.9). No more than 25 percent of the funds in the AMA may be allocated for this purpose over a 4-year period [SHC § 800.6(a)(4)].

9.3.1. NCCP and/or HCP Fees

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

Feasibility. This authorized activity is not feasible. At this time (February of fiscal year 2022/23), there are no HCPs or NCCPs that Caltrans can contribute or pay fees to in the GAI.

9.3.2. Conservation Bank Credit Purchase

Conservation banks are discussed in Section 4.3. Conservation banks are species-focused, and each bank's alignment with natural resource protection is documented through its BEI. In the GAI, CDFW is a signatory to two conservation banks, neither of which offer credits for the species of mitigation need (Table 4-2). FWS is a signatory to nine conservation banks, none of which offer credits for the species of mitigation need (Table 4-2). CDFW and FWS are cosignatories for two of the conservation banks.

Feasibility. This authorized activity is not feasible. Conservation bank service areas are shown on Figures 4-1 to 4-6. At this time (February of fiscal year 2022/23), no conservation bank credits are available for purchase in the GAI for the species of mitigation need.

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. Four mitigation banks occur in the GAI, all of which provide wetland and/or non-wetland water credits, including riparian and vernal pool habitat. The Corps is a signatory on all mitigation banks in the GAI (Table 4-2, Figures 4-1 to 4-6).

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. For existing banks, a BEI amendment would be required to formalize a process for bulk pre-transfer credit purchases, and additional time for amending the bank instrument should be considered. In 2021, the Interagency Project Delivery Team finalized new bank templates that incorporate pre-transfer purchase terms; additional Caltrans-specific terms would also need to be negotiated with bank sponsors. The decision to amend a BEI is at the discretion of the bank sponsor.

9.3.4. In-lieu Fee Credit Purchase

In-lieu fee programs are discussed in Section 4.4.[1] In-lieu fee mitigation occurs when a permittee provides funds to an in-lieu fee sponsor instead of either completing project-specific mitigation or purchasing credits from a conservation or mitigation bank and offers permittees an in-lieu fee option to satisfy its compensatory mitigation obligations as determined by the applicable regulatory agencies for impacts on aquatic resources authorized under the CWA, Rivers and Harbors Act, ESA, Porter-Cologne Water Quality Control Act, and other applicable laws. Once enough money is received by an in-lieu fee program, it implements wetland, stream, or threatened or endangered species habitat restoration, creation, enhancement, or preservation activities in a watershed or other defined area.[2] The in-lieu fee program's alignment with natural resource protection is documented through its enabling instrument and will be incorporated into future biological opinions on transportation projects.

There is one active in-lieu fee program with a service area that overlaps the GAI.

Feasibility. This authorized activity is feasible. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years, at which point the credits or values would be available to transportation projects. Pre-permit credits purchased from the NFWF Sacramento District California in-lieu fee program through an advance mitigation project might, with natural resource agency approval, be incorporated into future conditions on transportation projects.

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

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

9.3.5. MCA Credit Purchase

As discussed in Section 4.5, MCAs are an advance mitigation tool that can be developed when and where an RCIS is approved by CDFW. At this time (February of fiscal year 2022/23), instructions and guidance for establishing MCAs are currently being finalized by CDFW.[3] However, an approved RCIS is a precondition for MCA creation and there are no active or pending RCISs with service areas that overlap the GAI.

Feasibility. At this time (February of fiscal year 2022/23), this authorized activity is not feasible because no MCA credits are available for purchase in the GAI.

9.3.6. Conservation Bank Establishment

Instructions and guidance for establishing conservation banks are available from CDFW[4] and FWS.[5] Conservation banks are species-focused, and each bank's alignment with natural resource protection will be documented through its BEI. CDFW, FWS, and NMFS are potential signatories, and there also may be circumstances where the Corps and/or SWRCB would participate.

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

- Chapter 2, *Environmental Setting*
- Chapter 3, *Relevant Plans, Policies, and Regulations*
- Chapter 7, *Wildlife Resources Conservation Goals and Objectives*
- Chapter 8, *Aquatic Resources Conservation Goals and Objectives*
- Appendix C, *Land Cover Types*
- Appendix D, *Complete SAMNA Species Results*

An understanding of CDFW and FWS goals and objectives for wildlife resources in the GAI will improve the chances that credits established through an advance mitigation project will meet the compensatory mitigation needs of Caltrans' future transportation projects. In Chapter 7, *Wildlife Resources Conservation Goals and Objectives,* Caltrans analyzed and synthesized the relevant and applicable information listed in Chapter 3, *Relevant Plans, Policies, and Regulations*, to develop its understanding of natural resource regulatory agency goals and objectives for the GAI. In brief, it is Caltrans' understanding that a conservation bank that addresses the following goals would be consistent with CDFW and FWS goals:

- Conserve and expand habitat for species of mitigation need within the GAI to support ecosystem functions that are essential to recovery of the species (WILD-1).

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[3] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[4] https://wildlife.ca.gov/Conservation/Planning/Banking/Templates
[5] https://www.fws.gov/endangered/esa-library/pdf/Conservation_Banking_Guidance.pdf

- Preserve, enhance, and increase connectivity between blocks of habitat supporting species of mitigation need to allow for dispersal that will maintain resilience and variability of populations (WILD-2).[6]
- Support resiliency of the landscape to climate change (WILD-3).
- Decrease mortality and competition, and protect population health for species of mitigation need (WILD-4).
- Provide multi-species and multi-resource benefits (WILD-5).

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

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

9.3.7. Mitigation Bank Establishment

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

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

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

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

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

[8] https://wildlife.ca.gov/Conservation/Planning/Banking/Templates

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

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

- Ensure no net loss to area, functions, values, and condition of WOTUS and waters of the state to ensure no overall net loss and long-term net gain in the quantity, quality, and permanence of wetland acreage and values in California in a manner that fosters creativity, stewardship, and respect for private property, as described in Executive Order W-59-93[9] (AR-1).
- Restore and/or enhance the chemical, physical, and biological integrity of wetlands and non-wetland waters (AR-2).
- Support resiliency of aquatic resources to climate change (AR-3).
- Provide multi-resource benefits (AR-4).

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

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

9.3.8. In-lieu Fee Program Establishment

Each in-lieu fee program's alignment with natural resource protection is documented in its enabling instrument. Instructions and guidance for establishing in-lieu fee programs

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

are available from the federal agencies.[10] With respect to wildlife, like the Corps, FWS also follows federal guidance for establishing an in-lieu fee program; however, a supportive legislative, regulatory, and administrative pathway for CDFW to develop an in-lieu fee program has not been developed.

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

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

To support future transportation project permits, Caltrans would seek CWA credit establishment under the Corps' jurisdiction (WOTUS) and RWQCB jurisdiction (waters of the state). The Corps, EPA, SWRCB, and/or 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 ESA biological assessments/opinions in coordination with FWS and NMFS.

Feasibility. This authorized activity may be feasible. As pointed out above, instructions and guidance for establishing an in-lieu fee program for CWA credits are available from the federal agencies. After the Caltrans Director's approval for funding, delivering an advance mitigation project to establish an in-lieu fee program is expected to take 2 to 6 years. Credits or values would be available to transportation projects according to the Interagency Review Team-approved in-lieu fee enabling instrument. Caltrans may contract or subcontract implementation tasks.

9.3.9. MCA Credit or Value Establishment

As discussed in Section 4.5, MCAs are an advance mitigation tool that can be developed when and where an RCIS is approved by CDFW. In accordance with the *Regional Conservation Investment Strategies Program Guidelines*, MCAs are species- and species habitat-focused and can include credits under CESA and/or for riparian habitat or bed, bank, and channel habitat within streams, rivers, and lakes to meet mitigation needs under a Lake and Streambed Alteration Agreement. An MCA's alignment with natural resource protection will be documented through the foundational RCIS and the MCA itself (CDFW 2021). RCIS development is also an SHC § 800.6(a)-authorized advance mitigation project deliverable.

[10] https://www.spl.usace.army.mil/Missions/Regulatory/Mitigation/

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

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

To support future transportation project permits, an MCA or, if needed, an RCIS in concert with an MCA, funded through the AMA, could potentially establish CESA and/or Lake and Streambed Alteration Program credits[11] and CDFW would be the signatory. One species of mitigation need, Shasta salamander, is a state-only listed species; an MCA for CESA credits within one of the RCIS areas may be appropriate. Caltrans may also request other agencies to be signatories to the MCA or seek project-specific interagency agreements with other natural resource regulatory agencies whose jurisdiction overlaps with CDFW's. However, participation in an MCA may be more feasible for state agencies than federal agencies. Under federal definitions, MCAs may be treated as permittee-responsible mitigation. Federal agencies prioritize credits purchased or established through banking and in-lieu fee programs over permittee-responsible mitigation.

Feasibility. At this time (February of fiscal year 2022/23), instructions and guidance for establishing MCAs are under development by CDFW,[12] and the RCIS Program is conducting pilot efforts to inform the development of MCAs and associated agreements. Consequently, at this time, timelines and specifics related to the MCAs are uncertain and scoping and delivering an advance mitigation project within the AMP's timeline needs is unlikely. Caltrans will stay involved to understand how CDFW's pilots are going, but given the nature of the AMP's revolving account, Caltrans has determined that it cannot commit AMA funds to a pilot effort.

[11] Caltrans is the Lead Agency under CEQA; CDFW's permitting authority does not include conditioning transportation projects under CEQA (Section 7).
[12] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation

Nevertheless, in the future, Caltrans anticipates that when a CDFW-approved RCIS is in place[13] and after the Caltrans Director's approval for funding, delivering an advance mitigation project to establish an MCA and its credits or values would take 4 to 9 years: 2 to 3 years to set up the MCA, followed by 2 to 6 years to perform a conservation action or habitat enhancement action[14] to establish the credits or values. Credits would become available to Caltrans' SHOPP and STIP transportation projects according to the credit release schedule in the CDFW-approved MCA. Caltrans would include seeking signatures from natural resource regulatory agencies with overlapping jurisdictions and/or conducting parallel evaluations[15] with the other agencies into the scope and schedule; the additional time required to align with non-CDFW natural resource regulatory agencies may make this pathway infeasible.

Wildlife Crossing and Aquatic Corridor Enhancements

As described in Section 4.5 and discussed previously, the RCIS and MCA framework provides CDFW with a compensatory mitigation mechanism to approve credits for wildlife crossing and aquatic corridor enhancements. In other words, through an MCA developed under an RCIS, CDFW would be authorized to recognize credits established through wildlife crossing and aquatic corridor enhancement made separate and distinct from specific transportation projects. An MCA for connectivity would be consistent with Caltrans' understanding of natural resource regulatory agency goals and objectives that support resiliency of aquatic resources to climate change (AR-3), provide multi-resource benefits (AR-4 and WILD-5), conserve and expand existing habitat for species of mitigation need in the GAI (WILD-1), and preserve, enhance, and increase connectivity between blocks of species of mitigation need habitat (WILD-2).

To support future transportation project permits, it would be necessary for a wildlife crossing or aquatic corridor improvement MCA funded through the AMA to establish CESA and/or Lake and Streambed Alteration Program credits. In addition to the uncertainty listed above related to MCA implementation and associated agreements, connectivity enhancements have additional uncertainty related to mitigation crediting framework and outputs (temporary versus permanent), cost feasibility, engineering, and delivery timelines. In 2021, CDFW was authorized to approve compensatory mitigation credits for wildlife connectivity actions taken under the conservation and mitigation banking program or the RCIS program (FGC § 1955 et. seq.). Soon after, CDFW began developing a crediting methodology that is expected to be published in 2023. 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 the

[13] In accordance with SHC § 800.6(a)(3)(A), advance mitigation project scopes funded through the AMA may also include Caltrans first entering into or funding the preparation of an RCIS, which could add 2 to 3 years to the schedule.
[14] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[15] Parallel evaluations are undertaken when, for the same environmental enhancement/action, two or more agencies must employ different mechanisms to approve the credits.

RCIS Program's MCA guidelines for wildlife crossing and aquatic corridor enhancements 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 preservation of lands, waterways, aquatic resources, or fisheries that would measurably advance a conservation objective specified in an RCIS if the department concludes that the action or actions could conserve or create environmental values that are appropriate to mitigate the anticipated potential impacts of planned transportation improvements.*

Feasibility. At this time (February of fiscal year 2022/23), this authorized activity is not feasible. A supportive regulatory and administrative pathway for a natural resource regulatory agency to recognize credits or values outside of existing advance mitigation mechanisms, such as the procedures to establish banks, does not exist. Without an existing regulatory pathway, the time to establish credits or values for this advance mitigation project type is uncertain. Consequently, at this time, scoping and delivering an advance mitigation project within the AMP's timeline needs through this authorized activity is unlikely. Given the nature of the AMP's revolving account, the AMP has determined that Caltrans cannot commit AMA funds to a pilot effort.

9.3.11. Mitigation in Accordance with a Programmatic Mitigation Plan

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

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

This authorized activity would likely require an advance mitigation project-specific agreement, such as a cooperative agreement, and the time needed to establish credits or values for this advance mitigation project type is uncertain. In general, unless otherwise prescribed in regulation, an advance mitigation project-specific interagency agreement should include the agency's jurisdiction, resource type, resource value, protection level, service area, time frame, performance and compliance requirements, mitigation accounting procedures, funding, monitoring, and the advance mitigation project's closeout terms and conditions.

Feasibility. At this time (February of fiscal year 2022/23), 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.

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

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

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

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

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

Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Purchase mitigation bank credits	Yes, may require instrument amendment	Yes, four Corps banks	Yes, RWQCB, Corps, EPA, CDFW, FWS, and NMFS	1 to 3 years
Purchase in-lieu fee credits[b]	Yes, may require instrument amendment	Yes, one Corps in-lieu fee program; instrument has been amended	No	1 to 3 years
Purchase MCA credits	No	Not available	Not available	Not available
Establish mitigation bank	Yes	Yes, Corps, EPA, CDFW, FWS, and NMFS	Yes, RWQCB, Corps, EPA, CDFW, FWS, and NMFS	2 to 6 years
Establish in-lieu fee program	Yes	Yes, for Corps, EPA, FWS, and NMFS	Maybe, Corps, FWS, NMFS, EPA, and RWQCB	2 to 6 years
Establish MCA credits or values[c]	No; zero approved RCISs; MCA guidelines in progress	Maybe—MCA guidelines in progress	Maybe, RWQCB and NMFS Potential for parallel evaluation(s)	Unknown (pilot underway)
Establish RCIS and MCA[c]	No; zero approved RCISs; MCA guidelines in progress	Maybe—RCIS guidelines available; MCA guidelines in progress	Maybe, RWQCB, and NMFS Potential for parallel evaluation(s)	Unknown (pilot underway)
Establish mitigation that meets an RCIS objective	No	Not available	Not available	Not available
Establish mitigation in accordance with a programmatic mitigation plan	Maybe[d]	Maybe	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.
[d] See https://www.spk.usace.army.mil/Portals/12/documents/regulatory/mitigation/AdvancedPermitteeResponsibleMitigation_May2017_Public.pdf?ver=2017-06-01-104937-710

9.3.12. Discussion

Caltrans modeled its compensatory mitigation needs in the GAI for fiscal years 2021/22 to 2030/31 (Chapter 5, *Modeled Estimated Impacts*) and evaluated its needs in light of when transportation projects might need the mitigation (Chapter 6, *Benefiting Transportation Project Considerations,* and Section 9.2). As 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 (Sections 9.3.6 through 9.3.11).

Based on its evaluation, Caltrans found that, at this time (February of fiscal year 2022/23), a number of 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). For example, state waters/streams and riparian habitat could be addressed through the same credit purchase or by establishing a single credit establishment project. Under some conditions, establishing new mitigation credits through existing mechanisms may also be possible.

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 2 will consider all feasible options when developing advance mitigation project scopes. The feasibility of each authorized activity to meet the mitigation need depends on the availability of a regulatory and administrative pathway and other conditions summarized in Tables 9-4 and 9-5. Not included in the tables is an explicit comparison of other desired qualities, outcomes, or other factors of performing any particular authorized activity, which Caltrans District 2 will also consider based on its localized knowledge of delivering mitigation in its region. As just one example, Caltrans may prioritize advance mitigation projects that reduce risk in implementation and long-term management by eliciting others to be bank or in-lieu fee sponsors.

As described in the introduction to this chapter and in Section 9.1, to inform the advance mitigation project scope, Caltrans District 2 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 2 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 2 will commit to delivering the advance mitigation project within the scope, schedule, and budget communicated with nomination materials. At that point, Caltrans District 2 will initiate project delivery (see Steps 6 through 10 on Figure 1-2; Caltrans 2021b). Advance mitigation project delivery includes stakeholder engagement, project alternative analysis, coordination with natural resource regulatory agencies with the authority to approve compensatory mitigation, contracting with third parties and/or credit sponsors, and developing an agency-approved instrument and/or one or more advance mitigation project-specific interagency agreement. In addition:

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

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

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