ADVANCE MITIGATION PROGRAM

San Diego Sub-basin Regional Advance Mitigation Needs Assessment

Version 1.0

Establishing Caltrans' Need for Advance Mitigation for the San Diego Sub-basin forecast fiscal years 2021/2022 to 2030/2031

California Department of Transportation – District 11

July 2023

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LIST OF ACRONYMS

Acronym	Definition
ACE	Areas of Conservation Emphasis
ADC	Area of Deferred Certification
AMA	Advance Mitigation Account
AMP	Advance Mitigation Program
AMP Guidelines	*Advance Mitigation Program Final Formal Guidelines*
ASBS	area of special biological significance
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
CCA	Critical Coastal Area
CCC	California Coastal Commission
CDFW	California Department of Fish and Wildlife
CDP	Coastal Development Permit
CEHC	California Essential Habitat Connectivity Project
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNRA	California Natural Resources Agency
Corps	U.S. Army Corps of Engineers
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
DPS	distinct population segment
EFH	essential fish habitat
EMP	Environmental Mitigation Program
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
ESHA	environmentally sensitive habitat area

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
HAPC	habitat area of particular concern
HCP	habitat conservation plan
HU	hydrologic unit
HUC	hydrologic unit code
LCP	Local Coastal Program
LUP	land use plan
MCA	mitigation credit agreement
MPO	metropolitan planning organization
NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
OPC	Ocean Protection Council
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
SANDAG	San Diego Association of Governments
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
UA	uncertified area
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
Water Boards	SWRCB and RWQCB
WOTUS	waters of the U.S.

EXECUTIVE SUMMARY

This *San Diego Sub-basin 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 11 is the lead district for this planning-level effort.

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

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

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

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

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

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

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

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

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

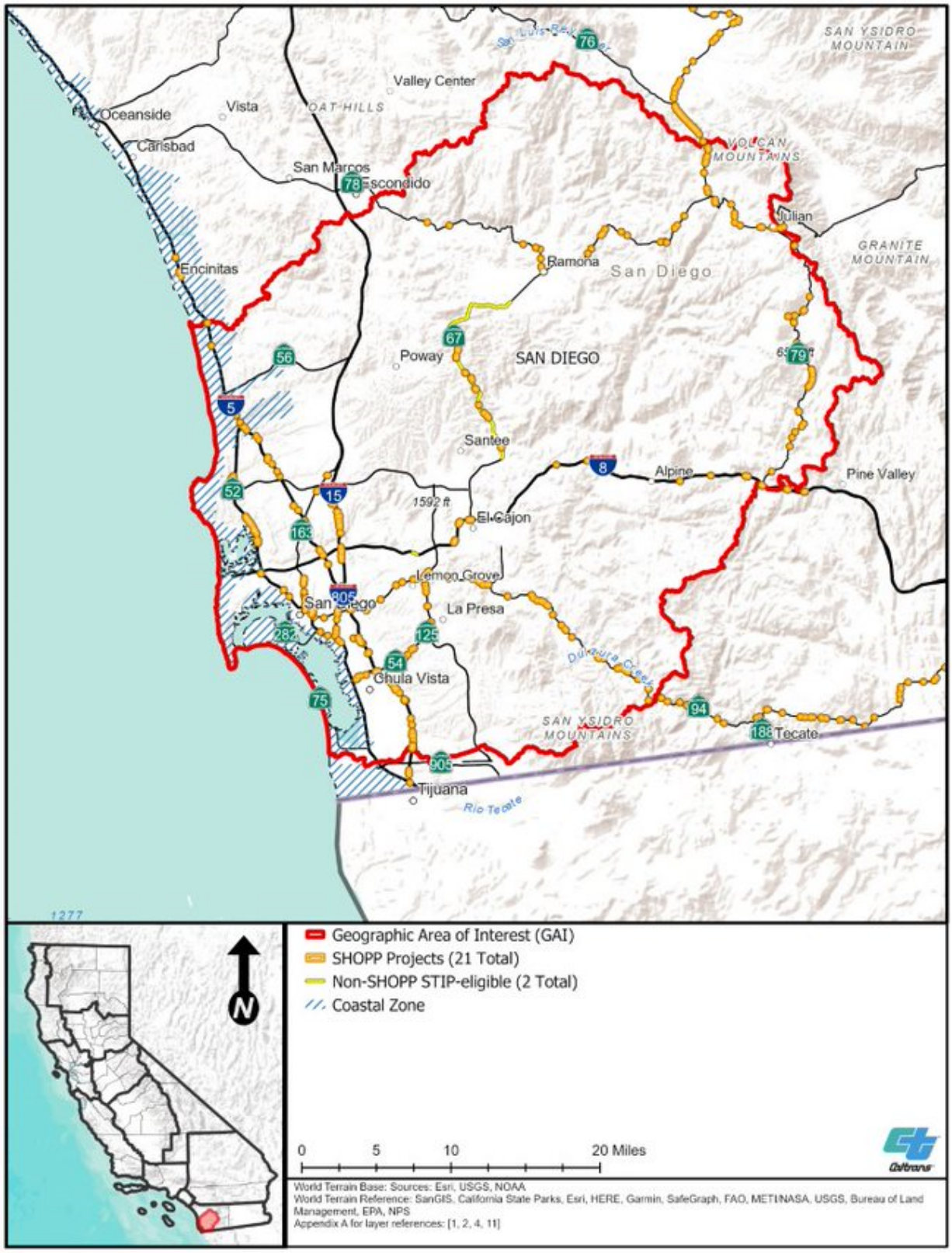
Through the RAMNA's review process, the conservation goals and objectives provided in the RAMNA were vetted with the natural resource regulatory agencies. Caltrans thinks incorporating natural resource regulatory agency goals and objectives into advance mitigation project scopes improves the chances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

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

ES.1 Geographic Area of Interest and Resource Focus

Focusing this assessment improves the probability that advance mitigation projects undertaken by Caltrans will yield credits (or similar) that will be usable and comply with an appropriate established regulatory framework. Focusing the assessment also improves the chances that resultant credits will be available on a timeframe that will revolve the AMA. Hence, for advance mitigation planning, Caltrans focused the RAMNA on a specific time period, a specific area, and typical compensatory mitigation needs.

Figure ES-1. GAI Road Infrastructure



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

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

The GAI assessed in this RAMNA consists of the San Diego Sub-basin. GAIs are established at an ecoregion or HUC-8 scale to define appropriate planning areas for mitigation implementation and anticipated use areas that align with natural resource regulatory agency practices (Caltrans 2019a). Caltrans District 11 selected the GAI because implementing landscape-scale mitigation in the sub-basin is likely to maximize State Highway Operation and Protection Program ("SHOPP") and State Transportation Improvement Program ("STIP") funded transportation project acceleration while maximizing environmental benefits.

Because the SAMNA model forecast impacts on hundreds of species' habitats, to further focus the planning effort, Caltrans District 11 identified species for which natural resource regulatory agencies condition transportation projects and those transportation projects that would most likely benefit if compensatory mitigation credits were available. These "species of mitigation need" are coastal California gnatcatcher (*Polioptila californica californica*) and least Bell's vireo (*Vireo bellii pusillus*). Coastal California gnatcatcher is federally listed as threatened. Least Bell's vireo is federally and state listed as endangered. Compensatory mitigation for aquatic resources[7] and riparian habitat were also identified as both historical transportation project compensatory mitigation needs and anticipated future transportation project compensatory mitigation needs within the GAI.

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

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

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 881,351 acres in southern coastal California within the San Diego Sub-basin (HUC-8), which is overlapped by portions of the Southern California Coast and Southern California Mountains and Valleys Ecoregion Sections in western San Diego County.

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 130 documents that may be relevant to advance mitigation planning and advance mitigation project delivery: 36 laws, guidelines, and regulations; 27 statewide and regional planning documents; 11 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; 6 water resources plans and documents; 14 county, city, and local government general plans; and 8 nongovernmental organization conservation and management documents. A summary and links to these documents can be found in Chapter 3.

ES.4 Existing Mitigation Opportunities

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

Chapter 4 presents readily available information regarding existing mitigation opportunities for the GAI. In brief, Caltrans identified 1 NCCP or HCP where Caltrans is a participant or may be eligible to participate, 19 pending or active conservation and/or mitigation banks, no in-lieu fee programs, no in progress or approved RCISs, and no MCAs.

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

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

ES.5 Estimated Impacts

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

Chapter 5 provides transportation project impact estimates for fiscal years 2021/22 to 2030/31. In the GAI, 21 SHOPP transportation projects and 2 non-SHOPP STIP-eligible transportation projects are in their conceptualization phase for the planning period. Many of these planned transportation improvements are not forecast to affect terrestrial or aquatic resources and many forecast impacts may be avoided during transportation project delivery. Nevertheless, the compensatory mitigation estimates presented reflect the best available information about compensatory mitigation needs at this time.

Impact estimates for wetland and non-wetland waters, from SHOPP transportation projects included in the SAMNA, are summarized in Tables ES-1 and ES-2. A qualitative assessment suggests that more than 3 acres of additional wetlands may be affected by STIP-eligible projects. Since natural resource regulatory agencies routinely place wetland and non-wetland water conditions on transportation projects, it is likely that Caltrans transportation project schedules would benefit from available credits for these resources. Similarly, impact estimates for riparian habitat and species of mitigation need are summarized in Tables ES-3 and ES-4. The qualitative assessment of the two STIP-eligible transportation projects did not predict impacts on these resources.

[8] For the purposes of this RAMNA, conservation goals and objectives are a broad set of regional natural resource sustainability goals and objectives that are consistent with both regulatory requirements and conservation science.
[9] Caltrans undertakes SHOPP transportation projects to address maintenance, safety, operation, and rehabilitation of the SHS; such projects do not add new capacity to the system. https://catc.ca.gov/programs/state-highway-operation-and-protection-program
[10] Metropolitan planning organizations, regional transportation planning agencies, and other public agencies also undertake transportation projects to address non-SHOPP STIP-funded transportation improvements.

Table ES-1. Summary of Estimated SHOPP Impacts on Wetlands in the GAI (acres)

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects[a]	Depressional Seasonal Natural Forested	Depressional Seasonal Unnatural Emergent	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Freshwater Pond	Total[b]
San Diego	18070304	8	<0.1	<0.1	<0.1	0.6	<0.1	**0.6**

[a] Transportation projects are listed in Appendix B.
[b] Total may be different on account of rounding.

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

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects[a]	Depressional Seasonal Natural Forested	Depressional Seasonal Unnatural Emergent	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Freshwater Pond	Total[b]
San Diego	18070304	8	<0.1	<0.1	<0.1	0.6	<0.1	**0.6**

[a] Transportation projects are listed in Appendix B.
[b] Total may be different on account of rounding.

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

Sub-basin (HUC-8)	Sub-basin Number	Ecoregion Section(s)	Number of Transportation Projects[a]	Valley Foothill Riparian	Total
San Diego	18070304	Southern California Coast	3	0.5	**0.5**
San Diego	18070304	Southern California Mountains and Valleys	2	<0.1	**<0.1**
Not applicable	Not applicable	**Total**	**5**	**0.6**	**0.6**

[a] Transportation projects are listed in Appendix B.

Table ES-4. Summary of Estimated SHOPP Impacts on Terrestrial Species of Mitigation Need in the GAI

Ecoregion Section	Coastal California Gnatcatcher Habitat: Number of Caltrans SHOPP Projects[a]	Coastal California Gnatcatcher: Estimated Habitat Impact (acres)	Least Bell's Vireo Habitat: Number of Caltrans SHOPP Projects[a]	Least Bell's Vireo: Estimated Habitat Impact (acres)	Total
Southern California Coast	12	6.1	2	0.2	**6.1**
Southern California Mountains and Valleys	5	1.4	0	0.0	**1.4**
Total[b]	**15**	**7.5**	**2**	**0.2**	**7.5**

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

ES.6 Benefiting Transportation Project Considerations

One intent of the AMP's founding legislation is for Caltrans to realize the potential of advance mitigation to accelerate transportation project delivery. At this time (July of fiscal year 2023/24), Caltrans is 2 years into the SHOPP Ten-Year Book planning period. Hence, for the time period under consideration, fiscal years 2021/22 through 2030/31, Caltrans District 11 intends to prioritize purchasing or developing mitigation credits or values that are planned for the end of the 10-year planning period.

Organized by aquatic resources, riparian habitat, and species of mitigation need, 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 wildlife habitat to allow for dispersal that will maintain resilience and variability of wildlife populations
- Supporting resiliency of the landscape to climate change and sea-level rise
- Decreasing mortality and competition, and protecting population health for species of mitigation need
- Prioritizing multi-species and multi-resource benefits

Objectives and sub-objectives are provided under each of the above goals in Chapter 7 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
- Supporting resiliency of aquatic resources to climate change and sea-level rise
- Providing multi-resource benefits

Sub-objectives are included for each goal in Chapter 8 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 (July of fiscal year 2023/24) mitigation that can be purchased or established by 2025/26 (within the next 2 years) could potentially address:

- 0.6 acre of wetlands, 2.5 acres of non-wetland waters, and 0.5 acre of riparian habitat impacts in the San Diego Sub-basin, potentially contributing to the acceleration of 8, 14, and 5 transportation projects, respectively
- 6.1 acres of coastal California gnatcatcher habitat and 0.2 acre of least Bell's vireo habitat impacts in the Southern California Coast Ecoregion Section, potentially contributing to the acceleration of 12 and 2 transportation projects, respectively
- 1.4 acres of coastal California gnatcatcher habitat Southern California Mountains and Valleys Ecoregion Section, potentially contributing to the acceleration of 5 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 (July of fiscal year 2023/24), purchasing credits approved through a bank or establishing new credits through a bank or in-lieu fee instrument is

likely feasible. The feasibility of each authorized activity to meet the forecast mitigation need in time to accelerate transportation projects will depend on the availability of a regulatory and administrative pathway and other conditions.

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

ES.9 Next Steps

Caltrans Districts will use the advance mitigation options identified in the RAMNA to inform advance mitigation project scoping, which will consider needs; conservation data and plans; input received from natural resource regulatory agencies, 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 *San Diego Sub-basin Regional Advance Mitigation Needs Assessment* ("RAMNA"), the California Department of Transportation ("Caltrans") District 11 presents its forecast of natural resource compensatory mitigation[1] needs for the San Diego Sub-basin (eight-digit hydrologic unit code "HUC-8") for a 10-year planning horizon. Sources used for this RAMNA are cited throughout this document, and links to 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 mitigation available that has already been vetted and agreed upon by natural resource regulatory agencies as representing mitigation actions before transportation projects are completely designed and funded.

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

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

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

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

1.1 AMP Overview

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

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

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

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

[a] Caltrans intends to contract or subcontract implementation tasks when appropriate and as required.
[b] When Caltrans is a permittee under the NCCP, or if Caltrans qualifies as a Participating Special Entity and the project is a covered activity in the NCCP
[c] See: https://www.wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[d] Under specific conditions, fish passage and wildlife crossing structures may qualify as enhancement actions under an RCIS in accordance with the California Fish and Game Code ("FGC") § 1850–1861.
[e] The State Water Resources Control Board ("SWRCB") and Regional Water Quality Control Boards ("RWQCBs") do not typically approve establishment of or accept preservation credits.
[f] Programmatic mitigation plans are defined in 23 U.S. Code ("USC") § 169(a) (SHC § 800.9). No more than 25 percent of the funds in the AMA may be allocated for this purpose over a 4-year period [SHC § 800.6(a)(4)].

1.1.1. AMP Guidelines

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

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 to inform advance mitigation project scopes that will be approved by the Caltrans Director. At this time, Steps 1 and 2 of the AMP's 5-step advance mitigation planning phase are complete.

Figure 1-1. Advance Mitigation Planning Phase

Source: Caltrans (2019a)

Figure 1-2. Advance Mitigation Project Delivery Phase

Source: Caltrans (2019a)

This RAMNA satisfies Step 3 (Figure 1-1; Caltrans 2019a) and provides the results of a regional assessment of Caltrans' advance mitigation needs in the San Diego Sub-basin.[3]

Caltrans District 11 will first use the information and analysis presented in this RAMNA to inform Step 4 of the advance mitigation planning phase. Step 4 is the point when Caltrans justifies, proposes, and scopes an advance mitigation project based on its needs (Figure 1-1; Caltrans 2019a). Advance mitigation project scopes informed by this RAMNA will provide enough information, at the appropriate level of detail, for an advance mitigation project to be nominated to the Caltrans Director for funding approval. The advance mitigation planning phase will conclude when the Caltrans Director approves a specific nominated Caltrans District 11 advance mitigation project for funding (Step 5; Figure 1-1; Caltrans 2019a). Thereafter, Caltrans District 11 will use the RAMNA as a reference (Caltrans 2019a).

[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).

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). This phase consists of implementing one or more of the 11 authorized advance mitigation activities (Table 1-1).

1.1.4. Program Constraints

Implicit to the AMP, the AMP Guidelines, advance mitigation planning, and advance mitigation project delivery is 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 preservation exists would not qualify for wetland or riparian impacts at some regulatory agencies.
- Natural resource regulatory agency approvals are discretionary and often conditional; well-executed advance mitigation does not necessarily increase the likelihood of obtaining agency approval for any particular transportation project.
- The 2008 Mitigation Rule 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

[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.

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 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.

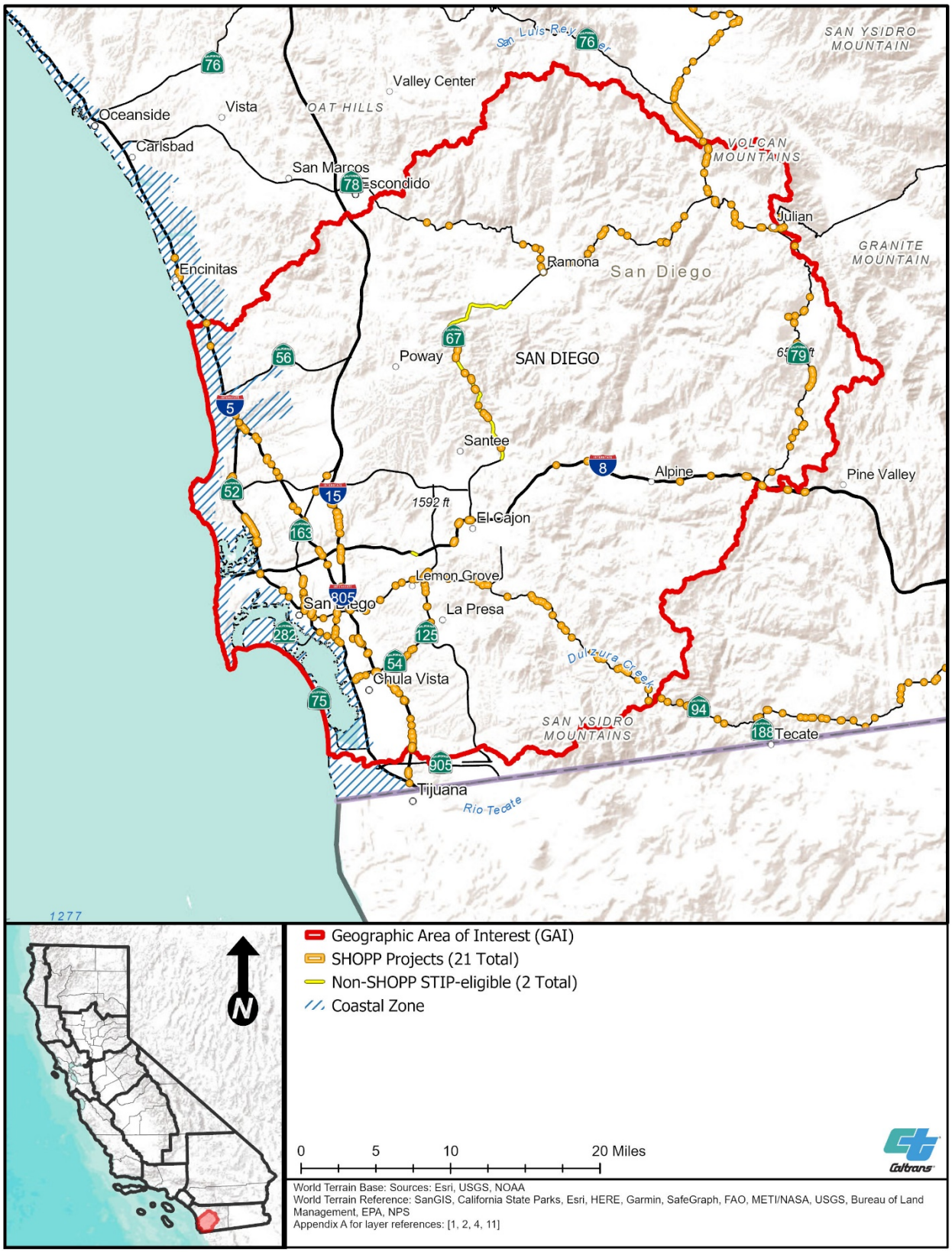
The above list is not presented in any order or priority.

1.2 Caltrans District 11 Transportation Infrastructure

Headquartered in San Diego, Caltrans District 11 is located in southern California in San Diego and Imperial Counties. Caltrans District 11 headquarters maintains and operates over 1,009 centerline miles of freeway, expressways, and conventional highways. These SHS roadways range from scenic two-lane highways to controlled-access freeways. Interstate 5, Interstate 15, Interstate 805, State Route 67, State Route 75, State Route 79, State Route 125, and State Route 163 are major north-to-south routes. Interstate 8, State Route 52, State Route 54, State Route 56, State Route 76, State Route 78, and State Route 94 are east-to-west routes that traverse District 11. Other transportation agencies that implement transportation improvements within the geographic area of interest ("GAI") for this RAMNA (MPOs, RTPAs, and other public agencies) are the Imperial County Transportation Commission, Metropolitan Transit System, North County Transit District, and San Diego Association of Governments ("SANDAG"). The aforementioned transportation agencies are eligible for State Transportation Improvement Program ("STIP") funding.

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

Figure 1-3. GAI Road Infrastructure



1.3 Regulatory Framework Summary

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

- California Coastal Act (Public Resources Code § 30000 et seq.)
- California Endangered Species Act ("CESA") (California 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 ("ESA") of 1973 (16 USC § 1531–1543), as amended
- Lake and Streambed Alteration Program (FGC § 1600 et seq.)
- National Environmental Policy Act ("NEPA") (42 USC § 4321 et seq.)
- Porter-Cologne Water Quality Control Act (California Water Code § 13000 et seq.)
- Rivers and Harbors Act of 1800, Section 10 (33 USC § 403)

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

Table 1-2. Natural Resource Regulatory Agencies with the Authority to Approve Compensatory Mitigation Credits (or Values) in the GAI

Partner	Web Address
Bureau of Land Management ("BLM"), El Centro	https://www.blm.gov/office/el-centro-field-office
BLM, Palm Springs – South Coast	https://www.blm.gov/office/palm-springs-south-coast-field-office
California Coastal Commission ("CCC")	https://www.coastal.ca.gov/
CDFW, South Coast Region	https://wildlife.ca.gov/Regions/5
CDFW, Marine Region	https://wildlife.ca.gov/Regions/Marine
State Water Resources Control Board ("SWRCB")	https://www.waterboards.ca.gov/
California Regional Water Quality Control Board ("RWQCB"), San Diego	https://www.waterboards.ca.gov/sandiego/
RWQCB, Colorado River Basin	https://www.waterboards.ca.gov/coloradoriver/
National Marine Fisheries Service ("NMFS"), West Coast Region	https://www.fisheries.noaa.gov/about/west-coast-region
U.S. Army Corps of Engineers ("Corps"), South Pacific Division, Los Angeles District	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"), Carlsbad	https://www.fws.gov/carlsbad/

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 condition(s). As a lead agency under CEQA and NEPA, Caltrans may also determine compensatory mitigation is required.

Some natural resource regulatory agencies also have 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,[5] and in-lieu fee programs require an instrument. Existing policies and regulations prescribe what an instrument must contain and address, as well as the terms of use for the credits generated by the mitigation bank, conservation bank, or in-lieu fee program. Similarly, establishing HCPs and NCCPs requires an agreement.

1.4 SAMNA

Predicting likely future transportation project effects on natural resources takes place at the intersection of transportation planning and conservation planning. In 2021, 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 2021

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

to 2031 (Caltrans 2021a). The forecast was performed using the Caltrans Statewide Advance Mitigation Needs Assessment Reporting Tool ("SAMNA Reporting Tool"), a geographic information system ("GIS") overlay model developed by Caltrans to support advance mitigation planning (Caltrans 2021b). Potential impacts for all 12 Caltrans Districts were estimated. Statewide, 765 transportation projects and more than 600 wildlife and aquatic resources were evaluated through the SAMNA Reporting Tool, yielding thousands of results (Caltrans 2021b). The subset of the Caltrans District 11 transportation projects that are planned in the GAI during the planning period covered by this RAMNA, as well as the HUC-8 and ecoregion section, advertised year, and planned activities for each planned transportation project, are included in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*, of this RAMNA.

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

SAMNA Caveats: The Statewide Advance Mitigation Needs Assessment ("SAMNA") is strictly and specifically intended to be used by Caltrans to justify, propose, and scope advance mitigation projects (Caltrans 2021b). 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 these methods shall not support the endorsement of or any other conclusion concerning any transportation project or transportation project alternative. Use or misuse of these methods and results for any purpose other than that which is intended shall be the sole responsibility of the individuals or entities conducting or supporting that use or misuse, who shall be fully liable, therefore.

1.5 GAI and Resource Focus

Given the quantity of resources evaluated through the SAMNA, limited AMA funding, and the need for the AMP to revolve the account, Caltrans 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 completed and/or (2) having compensatory mitigation credit supplies increased.

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

1.5.1. GAI

As pointed out in Section 1.4, the RAMNA is consistent with SAMNA Reporting Tool geospatial data and model assumptions. In consultation with the natural resource regulatory agencies, it was determined that presenting SAMNA results by HUC-8 sub-basin and ecoregion, 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. With regard to the Caltrans District 11 GAI, the San Diego Sub-basin within Caltrans District 11 was identified as a location where transportation improvement projects will occur and compensatory mitigation will be needed during the 10-year planning period, as described below.

To identify a focus area, consistent with Step 2 of the advance mitigation planning process (Figure 1-1), in 2021, Caltrans District 11 subject matter specialists:

- Reviewed the entirety of Caltrans District 11's SAMNA results by HUC-8 and ecoregion (Caltrans 2021b; available on: www.dot.ca.gov/programs/environmental-analysis/biology/advancemitigation);
- Reviewed the SAMNA results' associated potential future transportation project locations and activities anticipated for the State Highway Operation and Protection Program ("SHOPP") (Caltrans 2021b);
- Reviewed non-SHOPP STIP-eligible transportation improvement plans for the next 10 years;
- Observed that the portions of Caltrans District 11 located within the San Diego Sub-basin in the GAI have forecast compensatory mitigation needs during the planning period; and
- Identified the San Diego Sub-basin as a location where Caltrans and other public agencies that implement transportation improvements could benefit from advance mitigation planning, hereafter called the "GAI" (Figure ES-1, Figure 1-3).

1.5.2. Species of Mitigation Need

Compensatory mitigation for species in the GAI was identified as both a historical and anticipated future transportation project compensatory mitigation need within Caltrans District 11. SHOPP transportation projects have historically been conditioned by natural

resource regulatory agencies for some species more routinely than others and have benefited from mitigation credits, when available.

Caltrans does not typically need compensatory mitigation credits for species where impacts can be avoided or minimized. Further, the San Diego Multiple Species Conservation Program (San Diego County 1998) may address many of Caltrans' compensatory mitigation needs for species in GAI.[6] Hence, to further focus the planning effort, Caltrans District 11 identified species that, if compensatory mitigation credits were available and in-hand, transportation project schedules could potentially benefit. The determination is made after reviewing SAMNA results for the planning period. These "species of mitigation need" are coastal California gnatcatcher (*Polioptila californica californica*) and least Bell's vireo (*Vireo bellii pusillus*). Coastal California gnatcatcher is federally listed as threatened. Least Bell's vireo is federally and state listed as endangered.

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

1.5.3. Aquatic Resources

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

Compensatory mitigation 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 District 11. SHOPP transportation projects have historically been conditioned by natural resource regulatory agencies for these resources and have benefited from mitigation credits, when available.

The San Diego Sub-basin (HUC-8 18070304) informs 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 8, *Aquatic Resources Conservation Goals and Objectives*.

1.6 RAMNA

This RAMNA is a planning-level document that:

- Provides a desktop analysis of relevant available information pertaining to the San Diego Sub-basin, referred to as the GAI;

[6] See Chapter 4, Section 4.2 for more information about the San Diego Multiple Species Conservation Program.

- 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 natural resource regulatory agency signatories[7] 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 compensatory mitigation needs for the GAI and planning period, as reported by the SAMNA (Caltrans 2021b);
- Identifies information that will be important to Caltrans when scoping any of the AMP's authorized activities in the GAI, in accordance with SHC § 800.6(a), including documenting the existing compensatory mitigation supply;
- Incorporates information and feedback received from outreach to the natural resource regulatory agencies, FHWA, MPOs, RTPAs, other public agencies that implement transportation projects, Native American tribes, interested parties, and the public; and
- Analyzes Caltrans' options to meet its compensatory mitigation needs in the GAI through the AMP's authorized activities.

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

1.7 Coordination History

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

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

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

The AMP guidelines state that Caltrans will contact MPOs, RTPAs, and other public agencies that implement transportation 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 11 discussed STIP-eligible mitigation needs during regularly scheduled meetings with SANDAG.

1.7.2. RAMNA Review

The AMP Guidelines (Caltrans 2019a) state:

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

In March 2023, Caltrans distributed this RAMNA for review by FHWA, natural resource regulatory agencies, other transportation agencies (MPOs, RTPAs, and other public agencies that implement transportation improvements), Native American tribes, interested parties, and the public. Table 1-3 lists the commenters and the date of their communication. All comments received were considered, addressed, and incorporated into the document, as appropriate.

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

Commenter	Date of Comment Letter
CCC	June 6, 2023
CDFW[a]	June 12, 2023
Corps, Los Angeles District	June 6, 2023
EPA	June 10, 2023
FWS	June 8, 2023
SWRCB	June 6, 2023

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

1.7.3. Interagency Meeting and Coordination

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

Table 1-4. Interagency Meetings

Meeting Participants	Meeting Date
CCC, CDFW, SWRCB, RWQCB, Corps, FWS, Caltrans	June 6, 2023
CCC	June 7, 2023
Corps, Los Angeles District	July 13, 2023

1.8 Document Organization

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

Table 1-5. Document Organization

Chapter	Title	Content
Chapter 1	Introduction	This chapter introduces the RAMNA, placing it in the context of the AMP Guidelines, transportation network, and regulatory framework.
Chapter 2	Environmental Setting	This chapter describes the GAI analyzed in the RAMNA. It relies on geospatial data from the SAMNA Reporting Tool and other readily available information.

Chapter	Title	Content
Chapter 3	Relevant Plans, Policies, and Regulations	This chapter briefly describes laws, regulations, comprehensive plans, conservation plans, and land management plans that are applicable and relevant to the GAI that can inform both regional understanding and advance mitigation scoping.
Chapter 4	Existing Mitigation Opportunities	This chapter summarizes the mitigation credits (or similar) currently available to Caltrans and/or pending that are applicable to the environmental resources discussed in the RAMNA and located within or 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.
Appendices	Various	Appendices supporting this document: Appendix A – GIS Sources Appendix B –Transportation Projects Planned for the GAI during the Planning Period Appendix C – Local Coastal Programs Appendix D – Land Cover Types Appendix E – Complete SAMNA Species Results Appendix F – List of 303(d) Impaired Waters Appendix G – Aquatic Resource Locations

2. ENVIRONMENTAL SETTING

In this chapter, Caltrans describes the GAI in terms of ecoregion sections, land ownership, topography, coastal zone, climate, land cover types, invasive species, special-status species, critical habitat, essential fish habitat, connectivity, sub-basins, hydrology, flood hazard areas, water quality, wild and scenic rivers, aquatic resources,[1] riparian habitat, areas of special biological significance ("ASBSs"), 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 2021b). 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. 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 Sections

The GAI consists of approximately 881,351 acres in southern coastal California within the San Diego Sub-basin (HUC-8), which is overlapped by portions of the Southern California Coast and Southern California Mountains and Valleys Ecoregion Sections in western San Diego County (Table 2-1, Figure 2-1). Ecoregion sections are defined as the largest ecological unit of the U.S. Department of Agriculture ("USDA"), U.S. Forest Service ("USFS") National Hierarchical Framework of Ecological Units, which are nested within larger provinces (Cleland et al. 1997). The Southern California Coast Ecoregion Section is within the larger California Coastal Chaparral Forest and Shrub Province. The Southern California Mountains and Valleys Ecoregion Section is within the larger California Coastal Range Open Woodland – Shrub – Coniferous Forest – 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, managed by CDFW, FWS, and/or NMFS regulations.

Table 2-1. Ecoregion Sections in the GAI

Section	Acreage[a]	Ecoregion Section as Percentage of GAI
Southern California Coast	409,643	46.5
Southern California Mountains and Valleys	471,708	53.5
Total	**881,351**	**100%**

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

2.2 Land Ownership

The GAI is located in San Diego County (Figure 2-2). Most of the land in the GAI (54.9 percent) is privately owned and managed, with agricultural/rural land accounting for approximately one-third of the privately held land. Federal lands, which encompass 17.4 percent of land in the GAI, are administered and managed by the U.S. Department of the Interior's BLM, FWS, and National Park Service ("NPS") and the USDA's USFS (Table 2-2, Figure 2-2). USFS land includes the Cleveland National Forest. Counties, cities, and special districts own or govern 12.7 percent of land in the GAI. State lands, which encompass 6.8 percent of land in the GAI, include lands owned and managed by the California Department of Parks and Recreation, CDFW, Caltrans, California State Lands Commission, California State University, University of California, and other state entities. Approximately 4.1 percent of land in the GAI is owned and managed by Native American tribes and 4.1 percent is owned or managed by nonprofit conservancies and land trusts (Table 2-2, Figure 2-2).

Figure 2-1. Ecoregion Sections in the GAI

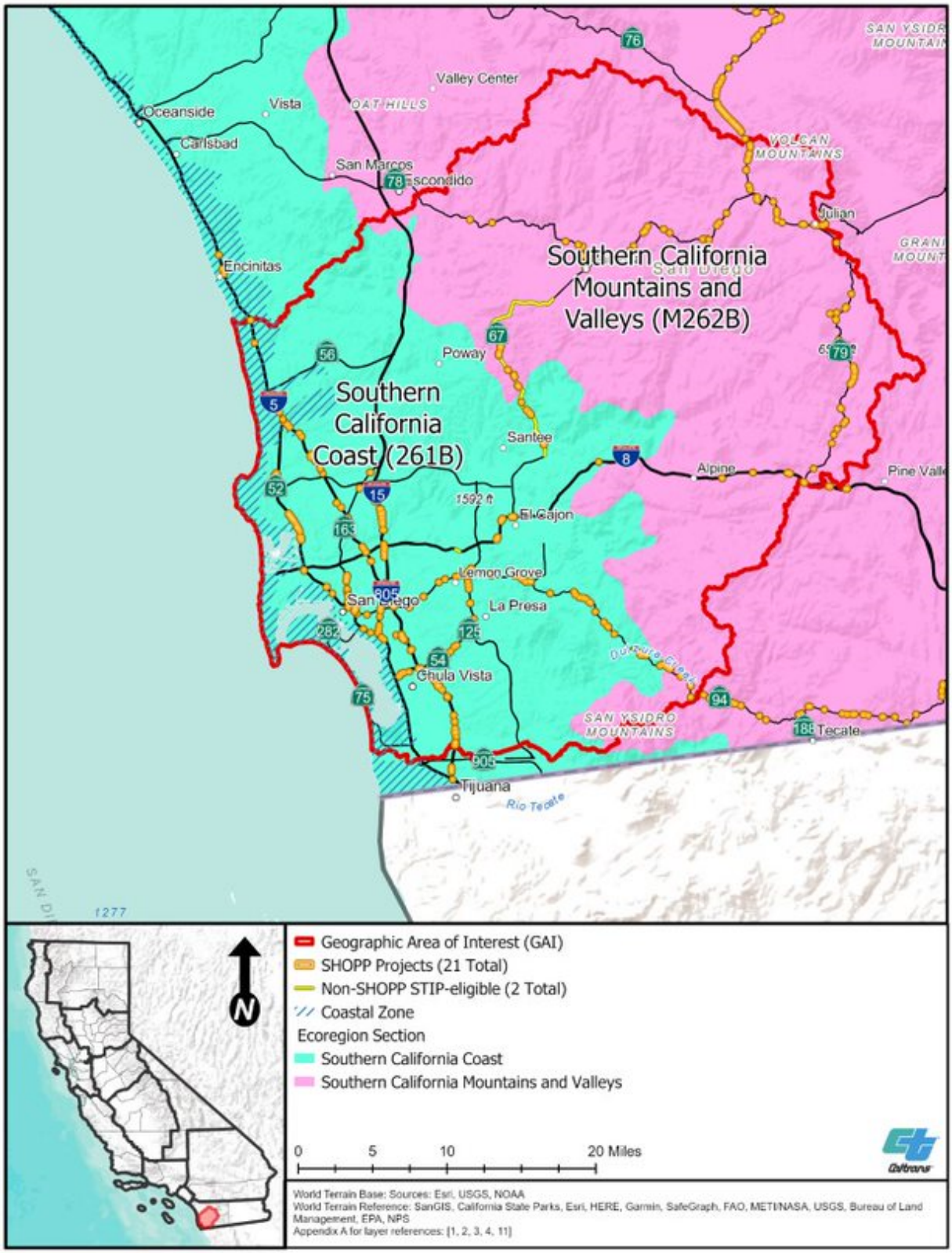


Figure 2-2. Land Ownership

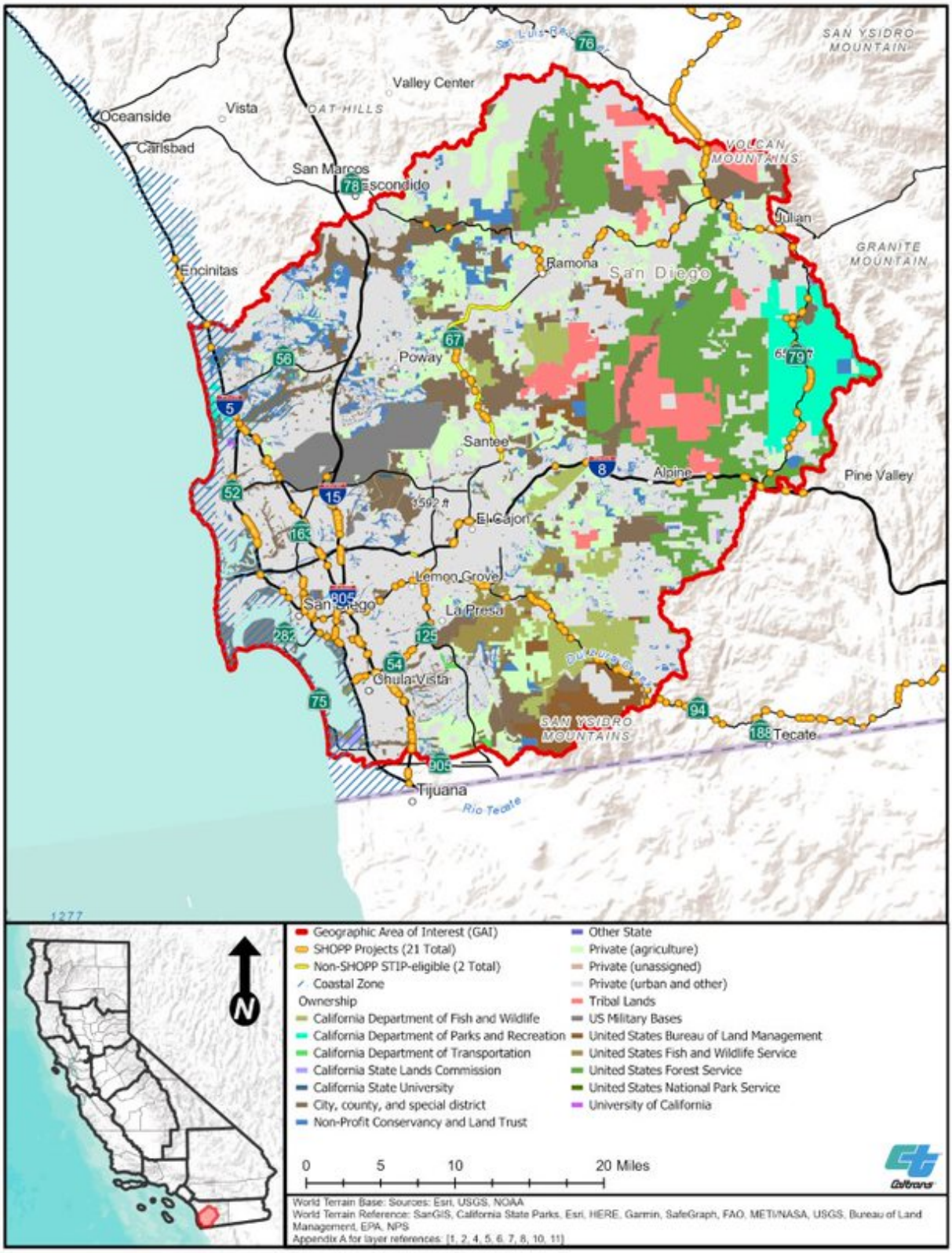


Table 2-2. Land Ownership

Land Owner or Land Use	Number of Parcels	Total Acreage per Agency/Owner[a]	Ownership as Percentage of GAI
Private (urban and other)	45	404,827	44.8
City, county, and special district	2,827	114,514	12.7
USFS	40	95,030	10.5
Private (agriculture)	1	91,938	10.2
Native American tribe	9	37,316	4.1
Nonprofit conservancy and land trust	4,161	36,956	4.1
California Department of Parks and Recreation	61	30,662	3.4
U.S. military bases	24	29,826	3.3
CDFW	188	28,219	3.1
BLM	42	20,139	2.2
FWS	143	12,692	1.4
California State Lands Commission	20	1,038	0.1
Caltrans	17	738	0.1
University of California	9	398	<0.1
California State University	1	155	<0.1
NPS	7	153	<0.1
Other state lands	1	17	<0.1
Private (unassigned)	1	6	<0.1
Total	**7,597**	**904,624**	**100%**

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

2.2.1. Protected Lands

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

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, most of the planned SHOPP transportation projects are in areas with no GAP status or a GAP status of 2 or 4, with fewer projects in areas with a GAP status of 3. Lands with conservation easements are also identified in the California Protected Areas Database; many of the planned SHOPP transportation projects are near conservation easements (Figure 2-3).

2.3 Topography

The San Diego Sub-basin, which defines the GAI, is located in southwestern and central San Diego County. It is bounded on the west by the Pacific Ocean and extends east and upward to the Peninsular Ranges (Figure 2-4). Generally sloping westward, the San Diego Sub-basin is characterized by narrow ranges and broad fault blocks as well as alluvial valleys, plateaus, coastal plains with wave cut benches and terraces, coastal bluffs, and coastal lagoons (San Diego RWQCB 2021; USFS 1994). The coastal terraces have been deeply dissected by streams draining to the Pacific Ocean and smoothed over time by local erosion (San Diego RWQCB 2021). The elevation in the San Diego Sub-basin ranges from sea level to 6,496 feet above mean sea level at Cuyamaca Peak (Figure 2-4).

Figure 2-3. Protected Lands

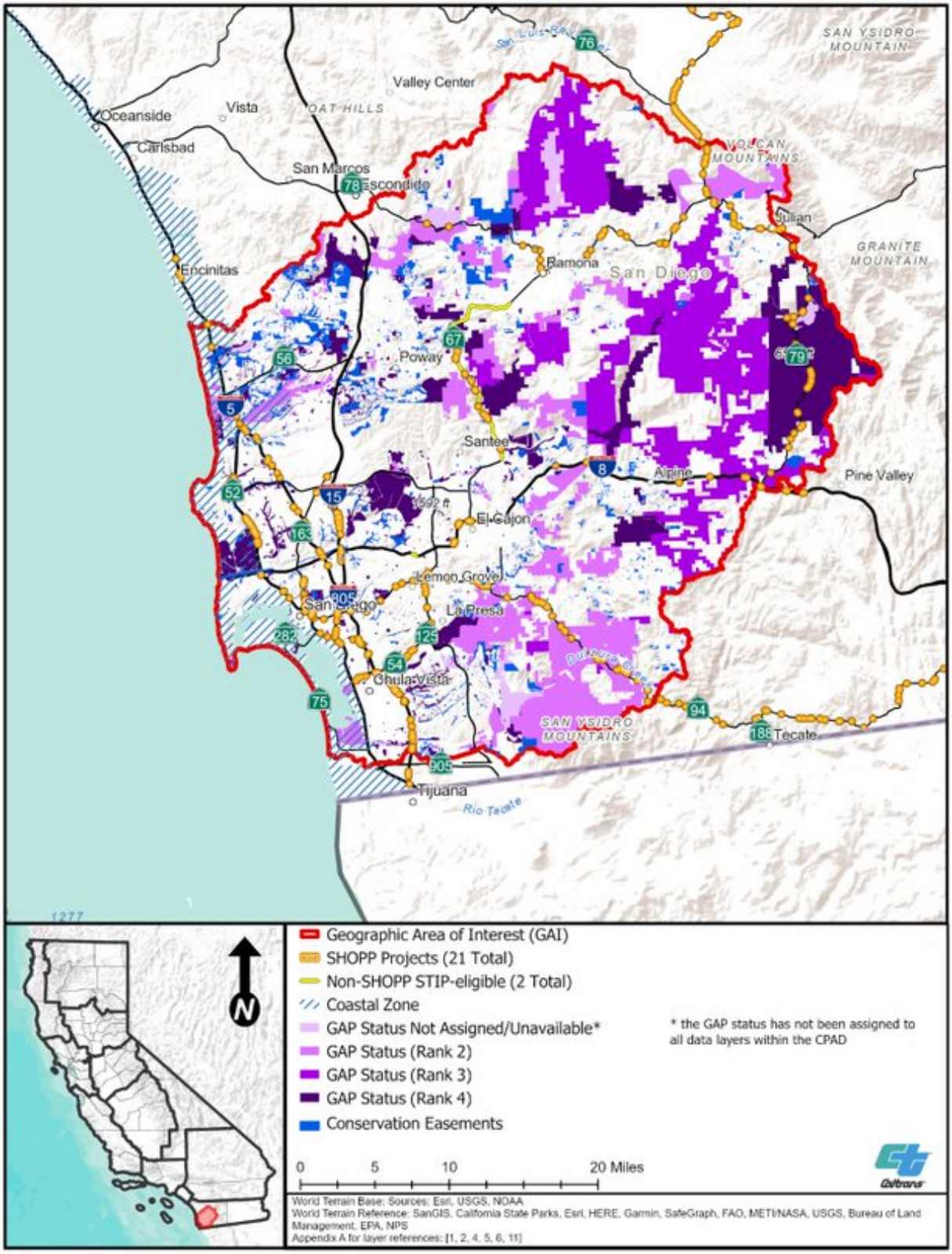


Figure 2-4. Topography

2.4 Coastal Zone

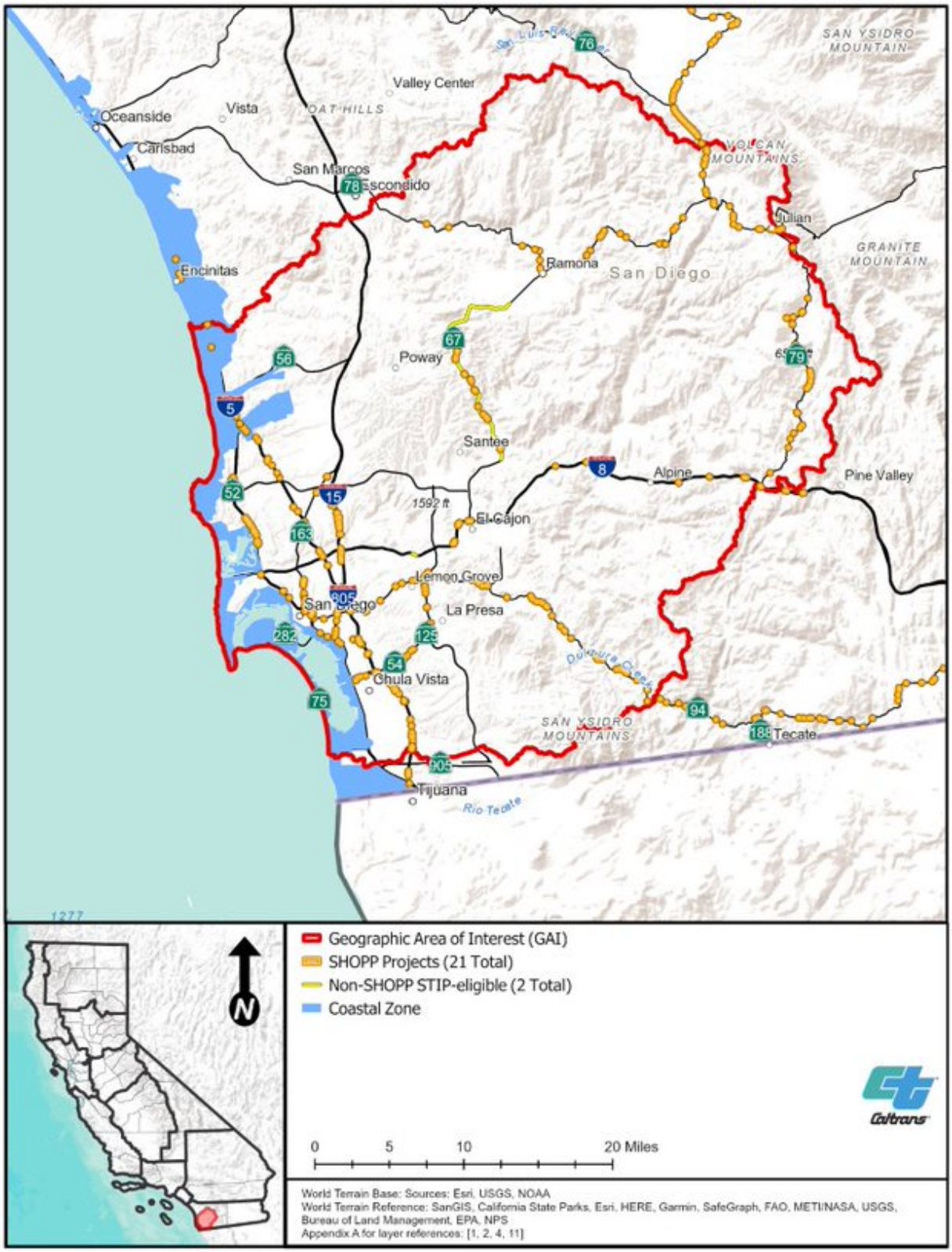
Public Resources Code § 30103(a) of the California Coastal Act defines California's coastal zone as the land and water area of the State of California from the Oregon border to the border with the Republic of Mexico, as depicted on maps identified and set forth in the Coastal Act of 1976, and represents the jurisdiction of the CCC. The coastal zone extends seaward to the state's outer limit of jurisdiction, including all offshore islands, and extends inland generally 1,000 yards from the mean high tide line of the sea. In significant coastal estuarine, habitat, and recreational areas, the coastal zone extends inland to the first major ridgeline paralleling the sea or 5 miles from the mean high tide line of the sea, whichever is less, and in developed urban areas the zone generally extends inland less than 1,000 yards. As indicated on Figure 2-5, the coastal zone overlaps the extreme western part of the GAI; even so, several planned SHOPP transportation projects intersect with the coastal zone.

2.4.1. Local Coastal Programs

The Coastal Act requires mitigation for impacts on coastal habitats, which are within the scope of this document, and other types of coastal resource impacts (for example, visual impacts), which are outside the scope of this document. The CCC regulates potentially impactful projects in the coastal zone primarily through the issuance of Coastal Development Permits ("CDPs"). Local coastal programs ("LCPs") are planning tools used to guide development in the coastal zone through preparation of land use plans and implementation of zoning ordinances. In coastal local jurisdictions where the CCC has reviewed an LCP for consistency with Coastal Act requirements and certified the LCP, the local government assumes CDP authority within its jurisdiction, with certain exceptions. For example, the CCC retains jurisdiction on tidelands—including former tidelands—submerged land, and land subject to the public trust.

Mapped in Appendix C, *Local Coastal Programs*, there are 21 LCPs used by local governments to guide development in the coastal zone in coordination with the CCC. Of these, the City of San Diego – Mission Bay Segment LCP has not been certified by the CCC; there are nine Areas of Deferred Certification ("ADCs") and two other uncertified areas. An uncertified area may be an area that was created through annexation, an area that was subsequently identified but may not have been included in an LCP segment, or an area that has applied for certification but has not yet been accepted by the CCC. A type of uncertified area, ADCs are geographic areas that have not been officially segmented for purposes of LCP preparation and were not certified during review of the LCP. The CCC retains permit authority until an LCP is effectively certified for these areas.

Figure 2-5. Coastal Zone



2.4.2. Environmentally Sensitive Habitat Areas

The California Coastal Act defines an environmentally sensitive habitat area ("ESHA") as "any area in which plant or animal life or their habitats are either rare or especially valuable because of their special nature or role in an ecosystem and which could be easily disturbed or degraded by human activities and developments" (§ 30107.5). Under the Coastal Act § 30240, an ESHA shall be protected against any significant disruption of habitat values, and only uses dependent on those resources (for example, nature study) are allowed in those areas. Furthermore, development in areas adjacent to an ESHA must be sited and designed to prevent significant degradation of the ESHA. Whether a habitat or location is considered an ESHA is determined by evaluating on-the-ground resources and the surrounding ecological context.

Although maps or descriptions of ESHAs are included in some of the LCPs covering the GAI, there may be ESHAs that have been added since the LCPs were certified. Specific ESHA definitions and policies vary among the 21 CCC-certified LCPs in the GAI (Appendix C). LCPs may list specific species habitats or specific natural communities as ESHAs or may designate geographic areas as ESHAs because of the presence of rare or valuable plants species or animal species, natural communities, or habitat. Designation of ESHAs is not limited to habitat for federally or state listed species or designated critical habitat. SWRCB designated ocean ASBSs (see Section 2.19); coastal wetlands and lagoons, tidepools, wilderness and primitive areas, and more may also be considered ESHAs. ESHAs are often threatened by habitat fragmentation, disturbance, degradation, or other anthropogenic factors, but while a type of ESHA may be determined to be sensitive because of demonstrated effects of such threats as those listed, it does not necessitate that a particular location must be so threatened itself to qualify as an ESHA. Areas identified as ESHAs in the LCPs in the GAI include, but are not limited to, coastal bluffs, coastal dunes, coastal waters, coastal mixed chaparral, coastal sage scrub, native coastal grasslands, streams, wetlands, marshes, tidepools, sloughs, freshwater ponds, and coastal barrel cactus (*Ferocactus viridescens*) (City of Coronado 2005; City of Imperial Beach 2022; City of San Diego 1987; San Diego County 2018).

2.4.3. Critical Coastal Areas

California's Critical Coastal Areas ("CCAs") program fosters collaboration among local stakeholders and government agencies to coordinate efforts to protect high resource value coastal waters from polluted runoff. This nonregulatory program, which is part of California's Nonpoint Source Pollution Program, is coordinated by CCC staff through a multiagency statewide committee. The committee includes, but is not limited to, the CCC, Caltrans (stormwater), CDFW, SWRCB, RWQCBs, and EPA.

The criteria for identifying CCAs reflect the CCA program's dual goals of improving degraded coastal water quality and providing extra protection from polluted runoff to

coastal waters with a recognized high resource value. To be a CCA, an area must meet one or more of the following criteria:

- Coastal watershed areas where an impaired waterway on the 1994 303(d) list is, or flows into, a bay or estuary.
- Coastal watershed areas where an impaired waterway on the 1998 303(d) list flows into a state or federal Marine Managed Area.
- Shoreline areas within San Francisco Bay where an impaired waterway on the 1998 303(d) list flows into wildlife refuges, waterfront parks, and beaches, as specified in the San Francisco Bay Plan.
- Coastal watershed areas that flow into an ASBS.
- Coastal watershed areas where an impaired waterway on the 2010 303(d) list is, or flows into, a Principal Bay or Estuary, as identified in CDFW (2001).
- Coastal watershed areas where an impaired waterway on the 2010 303(d) list is adjacent to a state Marine Protected Area, as defined in 14 Code of California Regulations § 632(a)(1)(A–C).

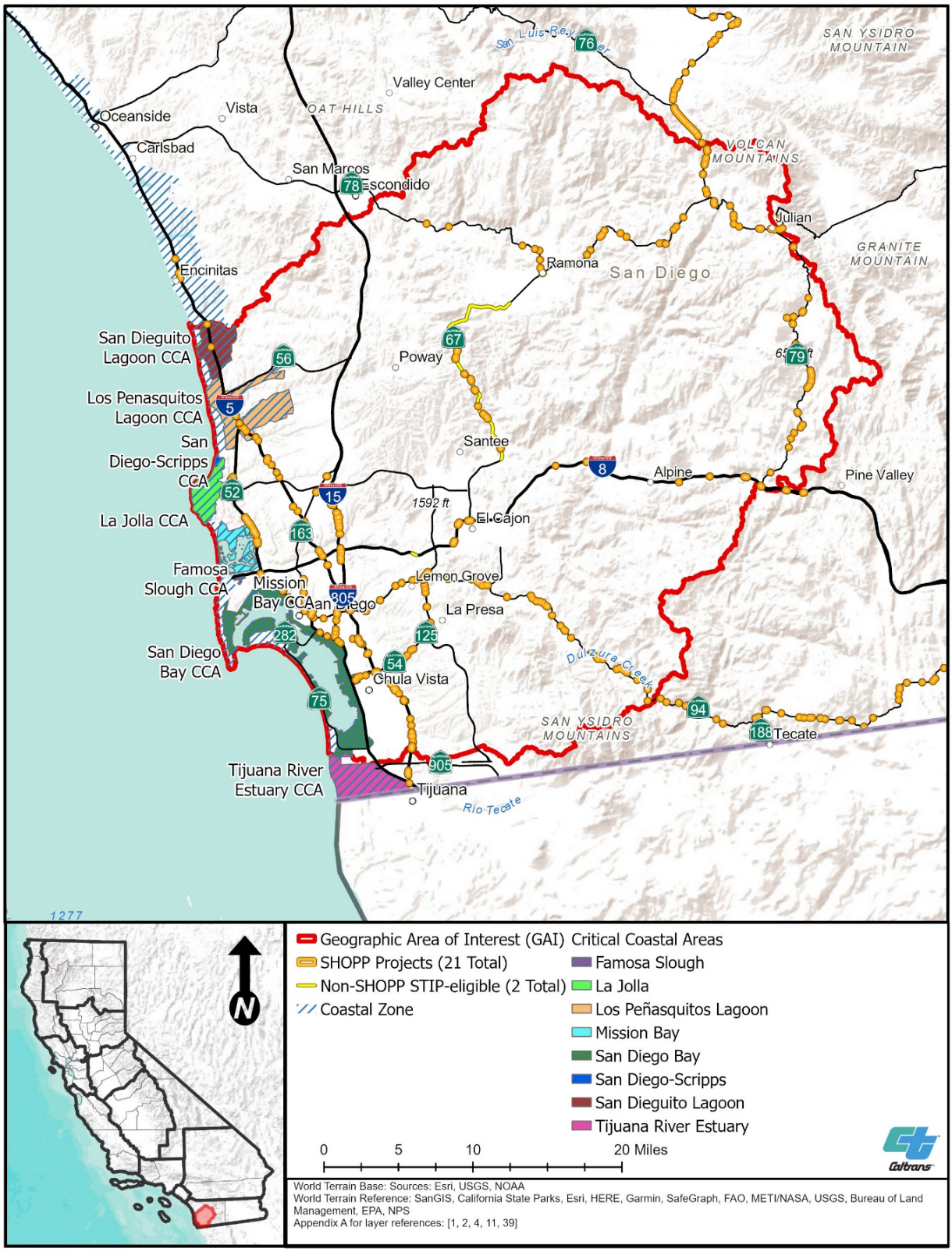
For more information on water quality and the 303(d) list, see Appendix F, *List of 303(d) Impaired Waters*. ASBSs are discussed in Section 2.19.

Statewide, 119 CCAs have been identified, 8 of which occur in the GAI (Figure 2-6). These include:

- San Dieguito Lagoon
- Los Peñasquitos Lagoon
- San Diego – Scripps
- La Jolla
- Mission Bay
- Famosa Slough
- San Diego Bay
- Tijuana River Estuary

The inland boundary of a CCA is the coastal zone boundary, as defined in the California Coastal Act. The shoreline boundary is determined on a case-by-case basis.

Figure 2-6. Critical Coastal Areas in the GAI



2.5 Climate

The GAI is characterized by a Mediterranean climate with relatively mild summers and winters (Caltrans 2019b). Mean annual temperature is about 55 to 65 degrees Fahrenheit (San Diego RWQCB 2016; USFS 1994). Summer daytime temperatures are moderated by morning fog and ocean breezes (USFS 1994). Mean annual precipitation in the area, which falls primarily as rain, with snow common only in the high mountains, ranges from 10 inches near the coast to 50 inches at higher elevations (San Diego RWQCB 2016; USFS 1994).

In the next 30 years, the climate is expected to change. Sea-level rise predictions used in California for planning purposes are summarized in Section 2.5.1. Results of Caltrans' climate vulnerability assessment are summarized in Section 2.5.2. The predicted resilience of the GAI to effects resulting from climate change is summarized in Section 2.5.3.

2.5.1. State of California Sea-level Rise Guidance

CNRA and the Ocean Protection Council ("OPC") *State of California Sea-Level Rise Guidance: 2018 Update* provides guidance to California state agencies for incorporating sea-level rise projections into planning, permitting, investment, and other decisions (CNRA and OPC 2018).

The stepwise approach provides guidance on how to select sea-level rise projections by evaluating risk and vulnerability. The following recommendations provide guidance on preferred sea-level rise planning and adaptation approaches, with an understanding that the diversity of communities, uses, and natural resources along California's coastline, as well as planning for new development versus existing structures, may merit different approaches to building resilience. Adaptation planning and strategies should:

1. Prioritize social equity, environmental justice, and the needs of vulnerable communities.
2. Prioritize protection of coastal habitats and public access.
3. Consider the unique characteristics, constraints, and values of existing water-dependent infrastructure, ports, and public trust uses.
4. Consider episodic increases in sea-level rise caused by storms and other weather-related events.
5. Coordinate and collaborate with local, state, and federal agencies when selecting sea-level rise projections; where feasible, use consistent sea-level rise projections across multiagency planning and regulatory decisions.
6. Consider local conditions to inform decision making.
7. Include adaptive capacity in design and planning.
8. Assess risk and conduct adaptation planning at community and regional levels, when possible.

The guidance includes sea-level rise projections centered on the year 2030, which overlaps the RAMNA's planning period (CNRA and OPC 2018). The guidance is based on the *Rising Seas in California: An Update on Sea-Level Rise Science* report

(OPC 2017), which reflects the most current understanding of sea-level rise science and modeling of global sea-level rise. Based on the CNRA and OPC (2018) guidance report, the La Jolla and San Diego tide gauges are located along the southern California coast in the GAI (Figure 2-7).

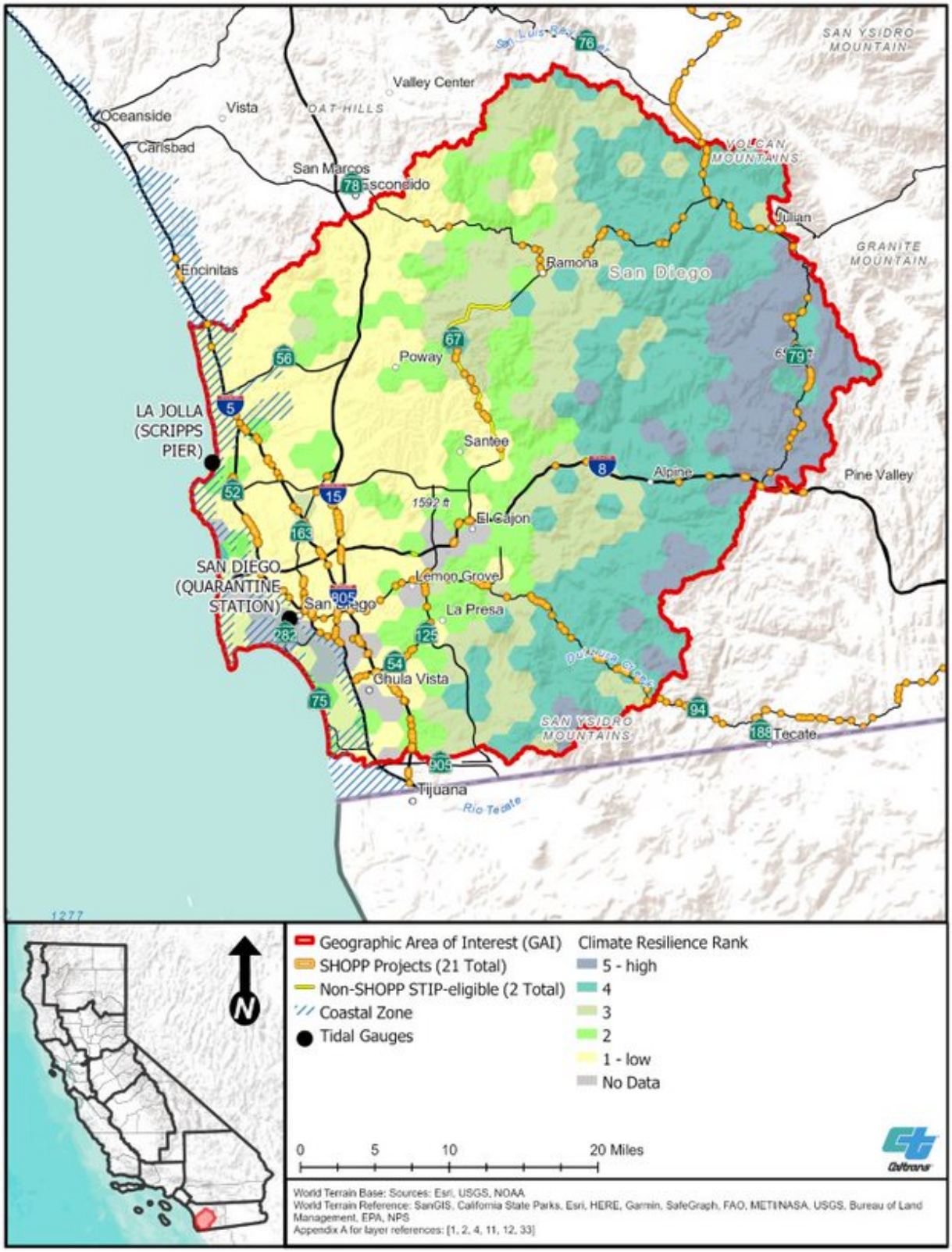
Sea-level rise projections for 2030 are based on the representative concentration pathway 8.5 (high emissions scenario) because that represents expected conditions over the next 10 years. The 2030 sea-level rise projections for the La Jolla and San Diego tide gauges range from 0.6 to 0.9 foot (CNRA and OPC 2018).

2.5.2. Climate Vulnerability Assessment

In 2019, Caltrans performed a statewide climate change vulnerability assessment for the SHS (Caltrans 2019b). The analysis provided in the *Caltrans Climate Change Vulnerability Assessments: District 11 Technical Report* (Caltrans 2019b) is based on global climate change data compiled by the Intergovernmental Panel on Climate Change. Caltrans applies three future emissions scenarios for greenhouse gas emission concentrations in the technical report—representative concentration pathway 2.6, which assumes global annual greenhouse gas emissions will peak in the next few years and then begin to decline substantially; representative concentration pathway 4.5, which assumes emissions will peak around 2040 and then begin to decline; and representative concentration pathway 8.5, which assumes that high emission trends continue to the end of the century—for three future 30-year periods centered on the years 2025 (2010 to 2039), 2055 (2040 to 2069), and 2085 (2070 to 2099).

The effects of climate change in the GAI pose risks for transportation infrastructure reliability and capacity. Transportation systems were designed for historical climate conditions. Changing climatic conditions, including an increased frequency of extreme weather events, are expected to disrupt and damage the SHS. Predicted climate change effects consist of projected extended periods of higher temperatures in 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 over the three time periods analyzed in the technical report (Caltrans 2019b). Climate change effects along the coast during the three future 30-year periods are expected to exacerbate coastal hazards, including storm surges, flooding, coastal erosion, cliff and shoreline retreat, landslides, and roadway flooding. By the end of the century, San Diego sea levels are projected to be from 1.1 to 7 feet above current levels (Caltrans 2019b).

Figure 2-7. Terrestrial Climate Resilience Rankings



Local relative sea-level trends based on tide gauge measurements of monthly mean sea level data from 1924 to 2021 for the La Jolla tide gauge and from 1906 to 2021 for the San Diego tide gauge indicate that sea levels along the coast of the GAI have risen at a rate equivalent to 0.67 and 0.72 foot in 100 years, respectively (National Oceanic and Atmospheric Administration ["NOAA"] n.d.). Based on the NOAA model for estimated sea-level rise presented in the *Caltrans Climate Change Vulnerability Assessments: District 11 Technical Report*, Interstate 5, Interstate 8, and State Route 75 are sections of the SHS that could become more vulnerable to high surf damage and periodic storm surges as sea levels rise (Caltrans 2019b).

2.5.3. Climate Resiliency

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

Resiliency is an important consideration when establishing compensatory mitigation. The terrestrial climate change resilience rank from the ACE dataset (CDFW 2018) is presented on Figure 2-7. Higher resilience is clearly shown in the eastern part of the GAI in the Peninsular Ranges (Figure 2-7). The predicted climate resilience of the GAI ranges from areas with low resilience or no data, located in the western half of the GAI, to areas with moderate to high resilience, located in the eastern half of the GAI.

2.6 Land Cover Types

General land cover types are depicted on the maps provided in Appendix D, *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 2021d).

Based on these data, shrub-dominated habitats account for the largest habitat type in the GAI, encompassing 49.5 percent of the GAI, with mixed chaparral and coastal scrub the most common (Table 2-3, Appendix D). Developed and non-vegetated habitat types (barren areas) combined account for 29.4 percent of the GAI, with urban the most common. Herbaceous-dominated habitats account for 10.2 percent of the GAI, with annual grassland the most common. Tree-dominated habitats account for 9.2 percent of the GAI, with coastal oak woodland the most common. Aquatic habitats account for 0.9 percent of the GAI, with lacustrine the most common. Land cover is generally shown on Figure 2-8.

Table 2-3. Land Cover Types

CWHR Habitat Type	Acres[a]	Cover as Percentage of GAI[b] (%)
Tree-dominated Habitats	**81,491**	**9.25**
Closed-Cone Pine-Cypress	3,226	0.37
Coastal Oak Woodland	42,503	4.82
Desert Riparian	197	0.02
Eucalyptus	3,488	0.40
Jeffrey Pine	1,417	0.16
Montane Hardwood	12,410	1.41
Montane Hardwood-Conifer	9,259	1.05
Montane Riparian	8	<0.01
Sierran Mixed Conifer	1,277	0.14
Valley Foothill Riparian	7,706	0.87
Shrub-dominated Habitats	**435,867**	**49.45**
Chamise-Redshank Chaparral	43,313	4.91
Coastal Scrub	152,851	17.34
Desert Scrub	40	<0.01
Desert Wash	69	0.01
Mixed Chaparral	238,293	27.04
Montane Chaparral	1,144	0.13
Sagebrush	156	0.02
Herbaceous-dominated Habitats	**89,763**	**10.19**
Annual Grassland	65,283	7.41
Fresh Emergent Wetland	1,132	0.13
Pasture	14,716	1.67

CWHR Habitat Type	Acres[a]	Cover as Percentage of GAI[b] (%)
Perennial Grassland	6,948	0.79
Saline Emergent Wetland	900	0.10
Wet Meadow	783	0.09
Aquatic Habitats	**7,510**	**0.85**
Lacustrine	7,510	0.85
Water	<1	<0.01
Developed Habitats	**259,202**	**29.41**
Cropland	4,813	0.55
Deciduous Orchard	7,530	0.85
Evergreen Orchard	285	0.03
Urban	246,554	27.97
Vineyard	20	<0.01
Non-vegetated Habitats	**7,518**	**0.85**
Barren	7,518	0.85
Total	**881,351**	**100%**

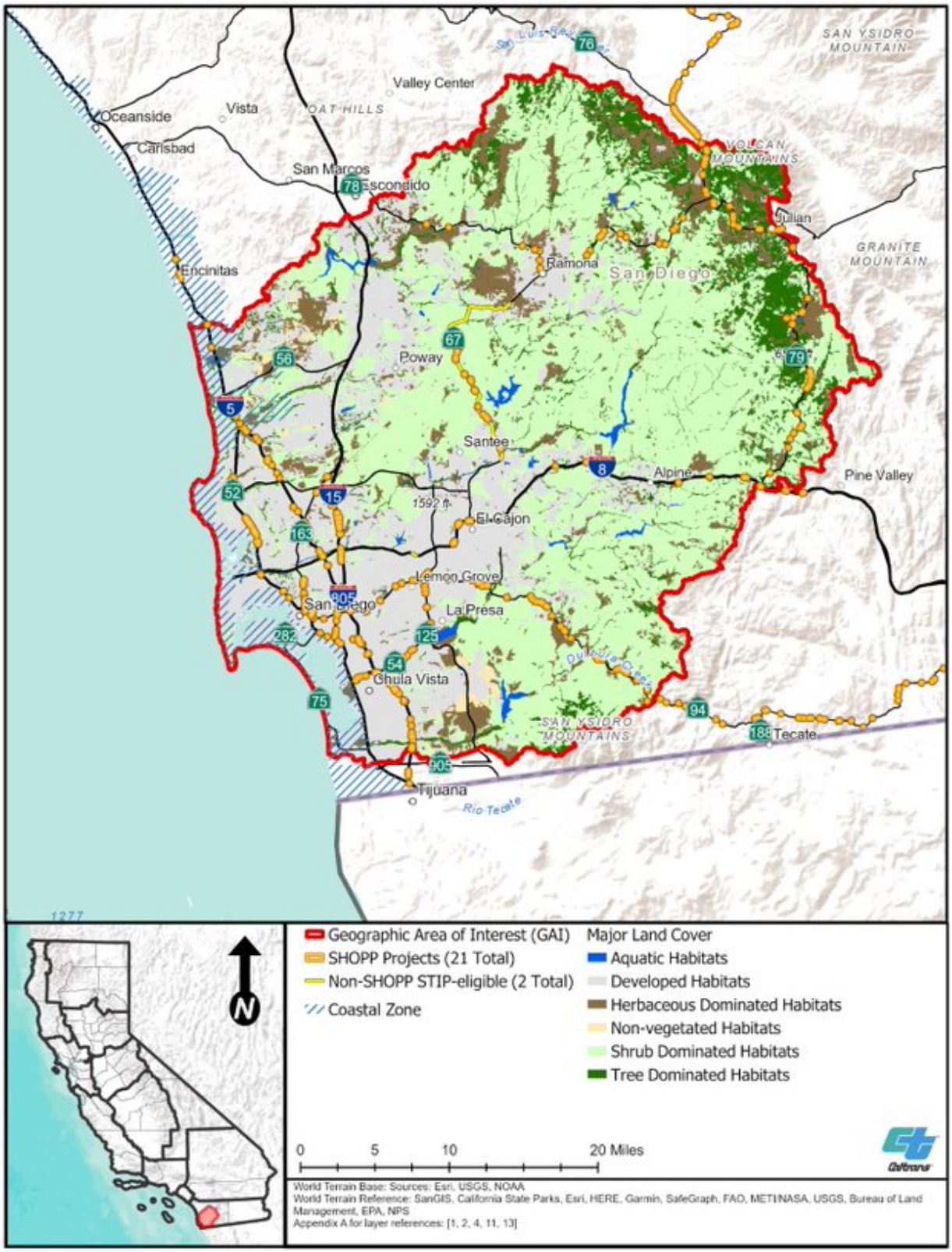
Source: Caltrans 2021d
[a] Numbers were rounded to the nearest whole number.
[b] Numbers were rounded to the hundredths.

2.7 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 (National Wildlife Federation 2019). Invasive species may affect native species, including special-status species, by directly competing for resources, preying on native species, introducing or spreading diseases, reducing the complexity and biodiversity of ecosystems, altering soil chemistry and water availability, and increasing wildfire potential (CDFW 2022a).

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 2022a).

Figure 2-8. Major Land Cover[a]



[a] For greater detail, see Appendix D.

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. Some of these species that occur in the GAI include giant reed (*Arundo donax*), onionweed (*Asphodelus fistulosus*), Australian saltbush (*Atriplex semibaccata*), wild oat (*Avena barbata* and *A. fatua*), annual false-brome (*Brachypodium distachyon*), black mustard (*Brassica nigra*), Saharan mustard (*Brassica tournefortii*), ripgut grass (*Bromus diandrus*), red brome (*Bromus rubens*), cheatgrass (*Bromus tectorum*), sea fig (*Carpobrotus chilensis*), freeway iceplant (*Carpobrotus edulis*), tocalote (*Centaurea melitensis*), bull thistle (*Cirsium vulgare*), poison hemlock (*Conium maculatum*), pampas grass (*Cortaderia selloana*), artichoke thistle (*Cynara cardunculus*), bermuda grass (*Cynodon dactylon*), cape-ivy (*Delairea odorata*), perennial veldt grass (*Ehrharta calycina*), redstem filaree (*Erodium cicutarium*), rattail sixweeks grass (*Festuca myuros*), fennel (*Foeniculum vulgare*), crown daisy (*Glebionis coronaria*), English ivy (*Hedera helix*), short-pod mustard (*Hirschfeldia incana*), lens-podded hoary cress (*Lepidium chalepense*), perennial pepperweed (*Lepidium latifolium*), floating water primrose (*Ludwigia peploides*), hyssop loosestrife (*Lythrum hyssopifolium*), crystalline iceplant (*Mesembryanthemum crystallinum*), tree tobacco (*Nicotiana glauca*), Bermuda buttercup (*Oxalis pes-caprae*), crimson fountain grass (*Pennisetum setaceum*), Russian thistle (*Salsola tragus*), London rocket (*Sisymbrium irio*), Spanish broom (*Spartium junceum*), tamarisk or saltcedar (*Tamarix* spp.), and Mexican fan palm (*Washingtonia robusta*) (Cal-IPC 2022b; CDFW 2015).

Western pine bark beetle (*Dendroctonus brevicomis*) is an invasive insect in the GAI that negatively affects pine trees. Native to western North American forests, it primarily attacks ponderosa pine (*Pinus ponderosa*) and Coulter pine (*P. coulteri*). This species of bark beetle usually colonizes larger diameter trees; however, the beetle will attack and kill trees of varying ages and sizes during outbreaks. This species, along with other bark beetle species, may cause tree mortality, especially in forests that are overly dense, over-mature, or both. In addition, trees that are diseased or weakened by drought, fire, lightning, or mechanical injuries are more susceptible to attack. Other beetles, such as the introduced Kuroshio shot hole borer (*Euwallacea Kuroshio*) and polyphagous shot hole borer (*Euwallacea whitfordiodendrus*) can tunnel into trees, causing fungal growth and weakening a tree's vascular system and structure. Activities of the shot hole borers and fungi cause an increase in diseased wood, inviting subsequent generations of the beetles to reinfest the host. Trees experience yellowing of foliage and branch dieback as a result, gradually leading to tree death (University of California Integrated Pest Management 2023). Western pine bark beetles are especially dangerous as they release pheromones that attract other beetles that attack pine trees. The species also hosts fungal spores that spread as they bore through the trees, accelerating the tree's death (USFS 2022). Although the species plays an important role in some forest habitats, outbreaks of the species can cause mass tree mortality. Wildfire severity and intensity

may also be altered due to the increase in available fuel as dead trees and fallen snags (USFS 2007).

Nonnative animals that are/may be present in the GAI and that can negatively affect aquatic species include bullfrogs (*Lithobates catesbiana*), African clawed frogs (*Xenopus laevis*), quagga mussels (*Dreissena bugensis*), New Zealand mud snail (*Potamopyrgus antipodarum*), Asian clam (*Corbicula fluminea*), nonnative crayfish, western mosquitofish (*Gambusia affinis*), and introduced sport and bait fish (including sunfish, bass, bluegill [*Lepomis macrochirus*], carp [*Cyprinus carpio*], and fathead minnow [*Pimephales promelas*]) (CDFW 2015). Nonnative animals that are/may be present in the GAI and that can negatively affect terrestrial wildlife through competition, predation, or parasitism include Argentine ants (*Linepithema humile*), goldspotted oak borer (*Agrilus auroguttatus*), polyphagous shot hole borer (*Euwallacea* spp.), European starlings (*Sturnus vulgaris*), and brownheaded cowbirds (*Molothrus ater*). Invasive animal species that are/may be associated with urban areas include domestic dogs (*Canis lupus familiaris*) and domestic cats (*Felis catus*) (CDFW 2015).

2.8 Special-status Terrestrial Species

Special-status terrestrial species are discussed below, with additional detail provided in Appendix E, *Complete SAMNA Species Results*. Threatened and endangered fish species with the potential to occur in the GAI are discussed in Section 2.17.4.

Special-status terrestrial species with the potential to occur in the GAI 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 2021a), and other information (Caltrans 2021b; Appendix E). 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, 110 non-fish special-status species have the potential to occur in the GAI, including 30 plants, 4 invertebrates, 5 amphibians, 9 reptiles, 36 birds, and 26 mammals.

Although it is the best information currently available, the SAMNA Reporting Tool's species list is uncertain (Appendix E). 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 E). 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.

2.9 Critical Habitat

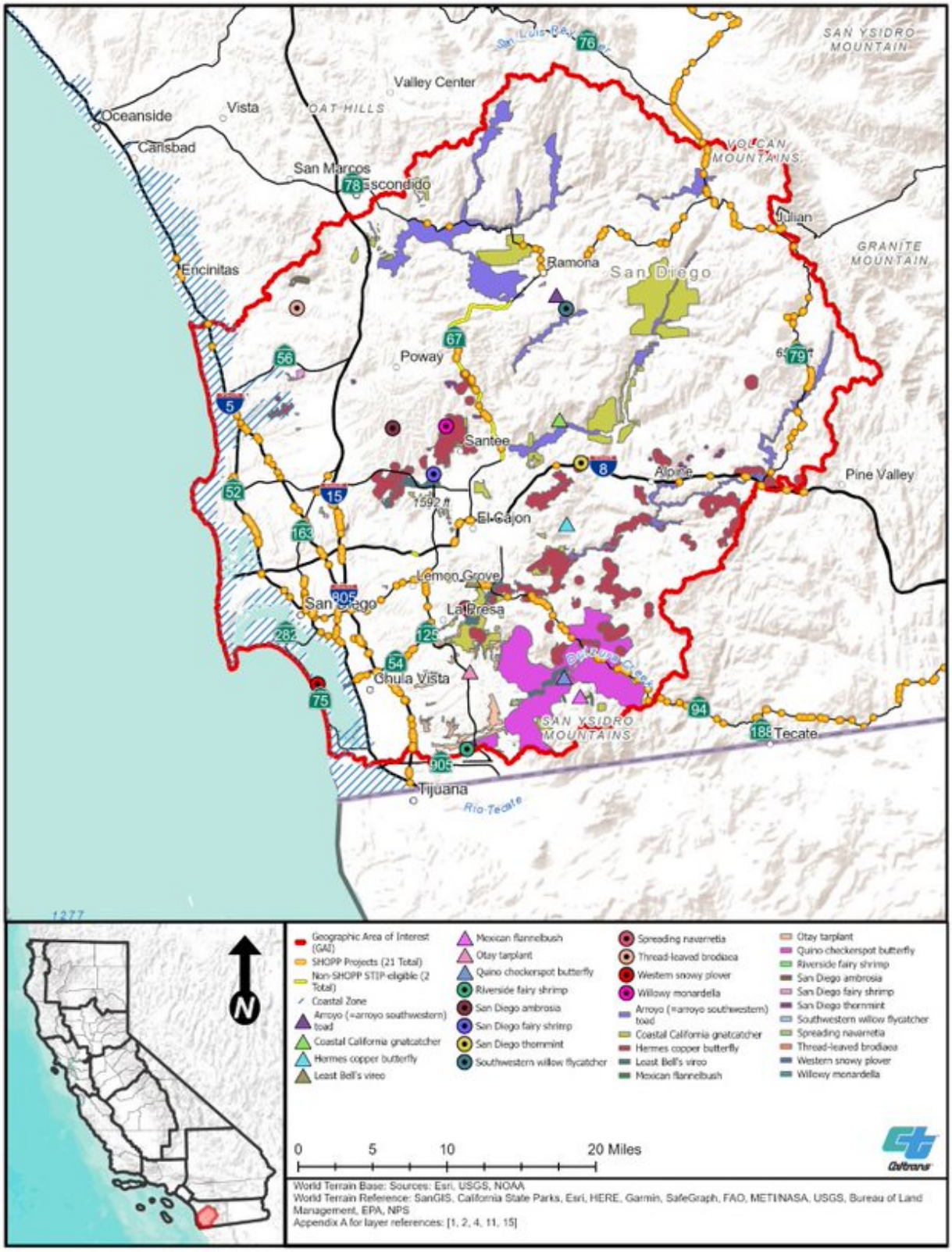
FWS and NMFS regulate impacts on critical habitat under the ESA. The ESA (16 USC § 1531–1544) defines critical habitat for a threatened or endangered species as (i) "specific areas within the geographical area occupied by the species at the time it is listed … on which are found those physical or biological 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 16 species (FWS 2021a; NMFS 2021a):

- arroyo toad (*Anaxyrus californicus*)
- coastal California gnatcatcher (*Polioptila californica californica*)
- Hermes copper butterfly (*Lycaena hermes*)
- least Bell's vireo (Vireo bellii pusillus)
- Mexican flannelbush (*Fremontodendron mexicanum*)
- Otay tarplant (*Deinandra conjugens*)
- Quino checkerspot butterfly (*Euphydryas editha quino*)
- Riverside fairy shrimp (*Streptocephalus woottoni*)
- San Diego ambrosia (*Ambrosia pumila*)
- San Diego fairy shrimp (*Branchinecta sandiegonensis*)
- San Diego thornmint (*Acanthomintha ilicifolia*)
- southwestern willow flycatcher (*Empidonax traillii extimus*)
- spreading navarretia (*Navarretia fossalis*)
- thread-leaved brodiaea (*Brodiaea filifolia*)
- western snowy plover (*Charadrius alexandrinus nivosus*)
- willowy monardella (*Monardella viminea*)

Critical habitat is an important consideration when establishing compensatory mitigation. Designated critical habitat for these species is indicated on Figure 2-9. Note that designated critical habitat represented by points on Figure 2-9 are units too small to depict at the regional level assessed in this RAMNA.

Figure 2-9. Federally Designated Critical Habitat



2.10 Essential Fish Habitat

NMFS is responsible for ensuring impacts on essential fish habitat ("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 2017). 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 2017). The GAI includes EFH for krill, finfish, coastal pelagic species, and groundfish (Figure 2-10).

2.10.1. Habitat Areas of Particular Concern

The Pacific Fishery Management Council identifies habitat areas of particular concern ("HAPCs") and recommends HAPCs to NOAA Fisheries consistent with the Magnuson-Stevens Act. HAPCs are a discrete subset of EFH that consist of areas considered a high priority for conservation, management, or research because they provide important ecosystem functions that can be especially sensitive to degradation as a result of human activities, can be stressed by development, or are notable because of their rarity. An area designated as an HAPC prioritizes and focuses conservation efforts rather than automatically requiring its protection or restrictions. HAPCs may be important for healthy fish populations; however, other EFH areas can also provide ecological functions necessary to support and maintain sustainable fisheries and a healthy ecosystem (NMFS 2021b).

Within the GAI, HAPCs include estuaries, kelp canopies, rocky reefs, and seagrass near or in San Elijo Lagoon, San Dieguito Lagoon, Los Peñasquitos Lagoon, Mission Bay, San Diego Bay, and along most of the coastline. HAPCs that intersect the SHS are shown on Figure 2-11.

Figure 2-10. Essential Fish Habitat

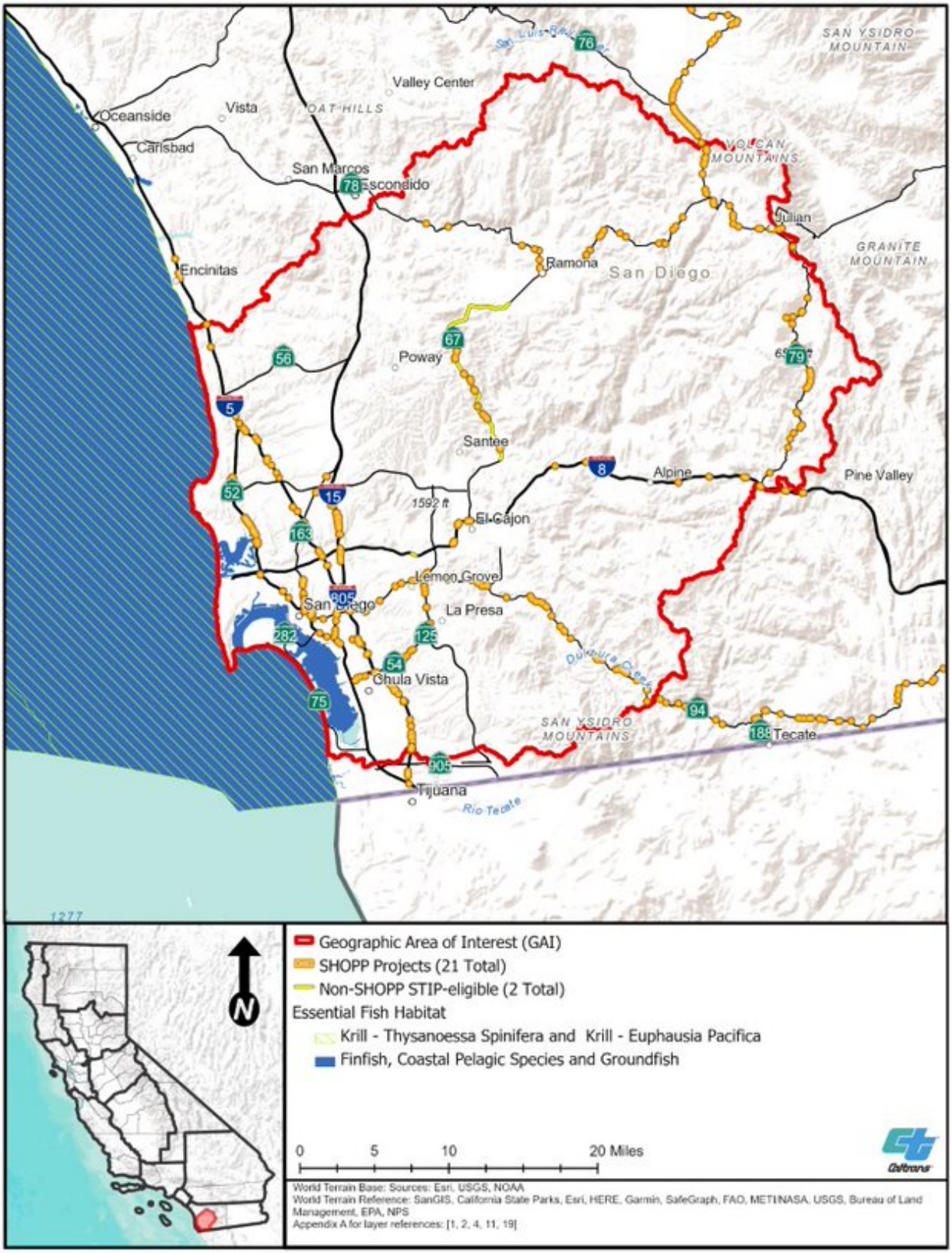
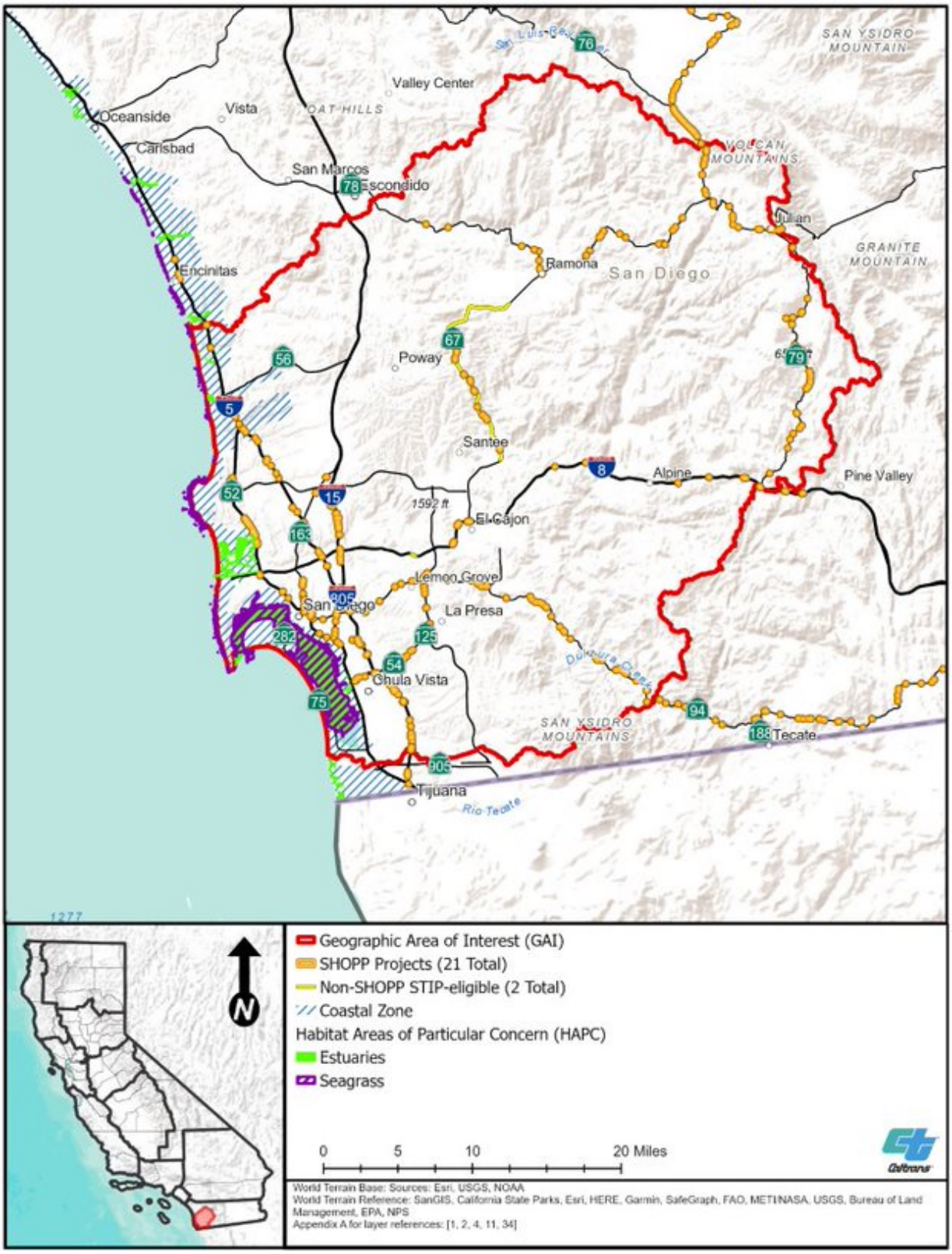


Figure 2-11. Habitat Areas of Particular Concern



2.11 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 2019b).

2.11.1. Wildlife Movement

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

California Essential Habitat Connectivity

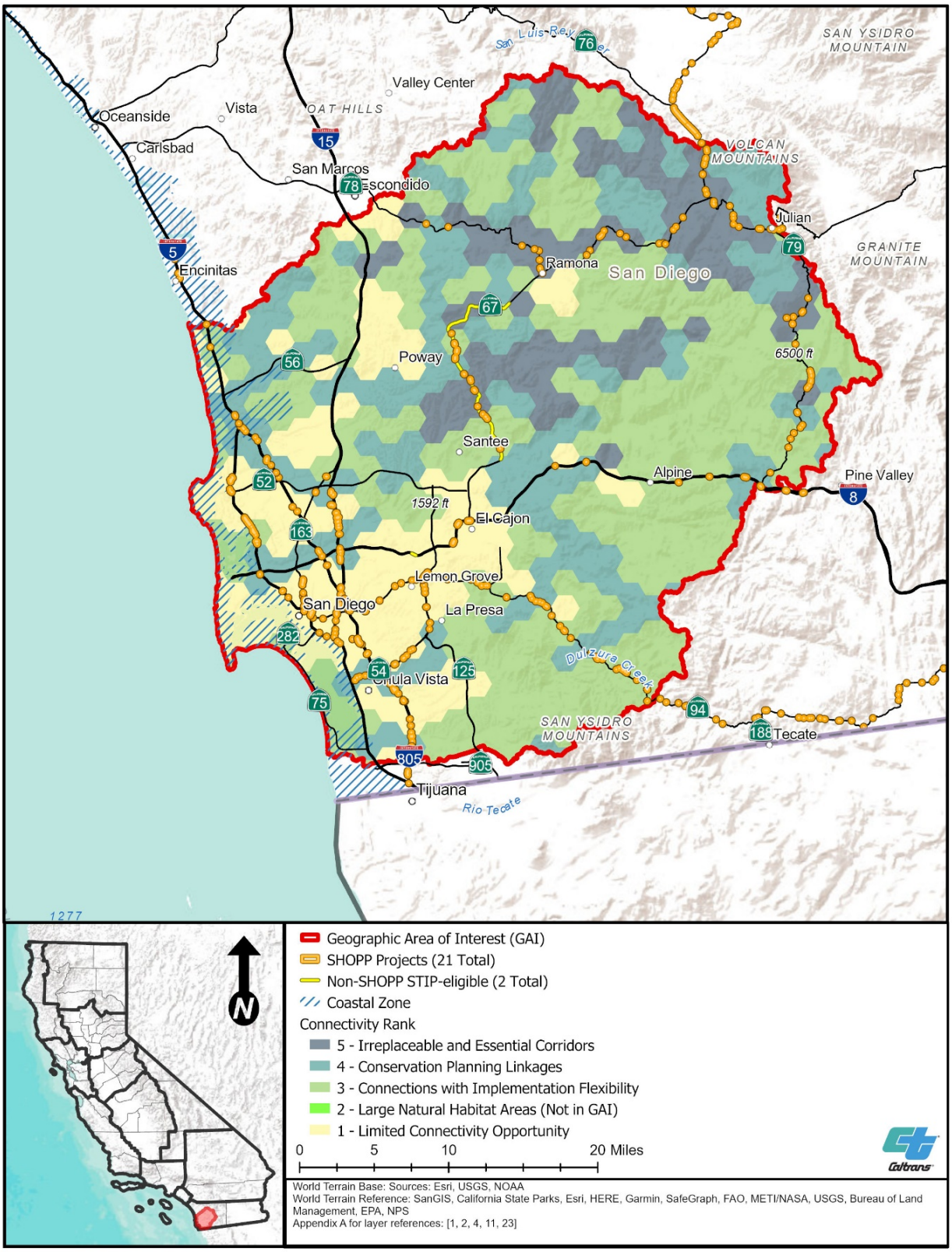
The CEHC Project, a statewide assessment commissioned by CDFW and Caltrans, identified large remaining blocks of intact habitat or natural landscape that support native biodiversity and modeled linkages or essential connectivity areas between them that need to be maintained, particularly as corridors for wildlife (CDFW 2022b; Spencer et al. 2010). These connectivity areas were broadly defined, focusing on ecological integrity rather than species-specific habitat needs, and included potential riparian connections between landscape blocks. For instance, connectivity areas were selected to connect existing reserves across land that has been highly altered and fragmented by agriculture, urbanization, and roads, which typically constrain wildlife movement (Spencer et al. 2010).

CDFW's Areas of Conservation Emphasis

CDFW's ACE version 3 terrestrial connectivity dataset builds on the CEHC Project and includes mapped corridors or linkages and where they occur in relation to large, contiguous natural areas (Figure 2-12). It also incorporates species-specific, fine-scale linkage information developed at a regional scale, where available, and includes areas not evaluated by the CEHC Project. Connectivity ranks in the terrestrial connectivity dataset were assigned as follows:

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

Figure 2-12. Terrestrial Connectivity



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

Connectivity is an important consideration when establishing compensatory mitigation. Most of the planned SHOPP transportation projects occur in areas with a connectivity rank of 1 or 5, with fewer planned transportation projects occurring in areas with a connectivity rank of 3 or 4 (Figure 2-12).

Connectivity Monitoring Strategic Plan

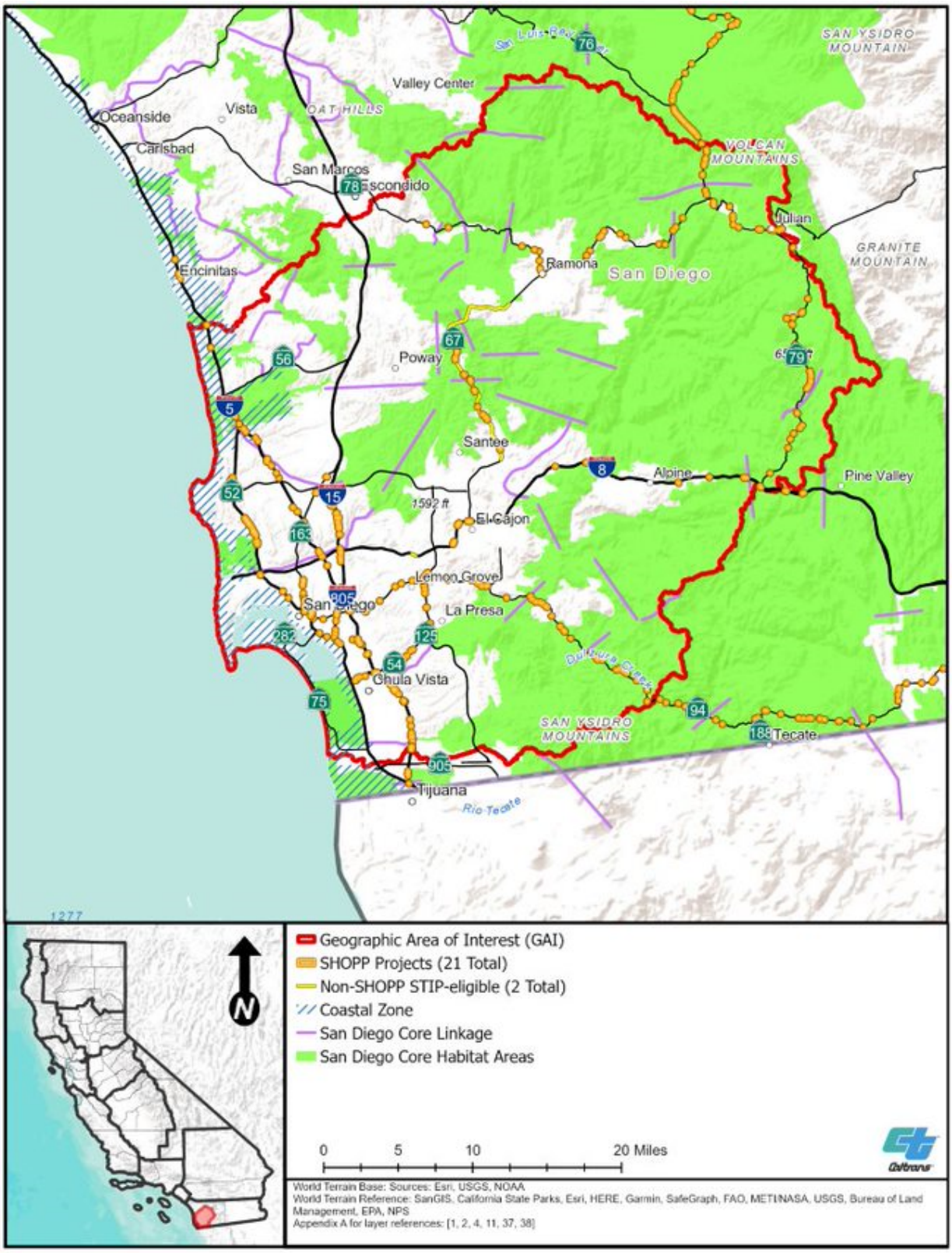
San Diego core linkages and habitat areas were updated in the Connectivity Monitoring Strategic Plan as part of *The Management and Monitoring Strategic Plan for Conserved Lands in Western San Diego County: A Strategic Habitat Conservation Roadmap* (San Diego Management and Monitoring Program and The Nature Conservancy 2017). The Connectivity Monitoring Strategic Plan provides a landscape-scale adaptive management and monitoring framework for prioritized species and vegetation communities in western San Diego County. The core linkages were selected to assist with prioritizing management and monitoring activities within the Connectivity Monitoring Strategic Plan area (Figure 2-13). There are more core linkages than those addressed by the CEHC Project, although the core habitat areas are similar.

CDFW's Restoring California's Wildlife Connectivity 2022 Report

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

Three priority wildlife movement barriers were identified in the GAI. These barriers and the target species for movement include: (1) State Route 67 between Mapleview and Etcheverry Streets (mule deer, bobcat, mountain lion, western toad, and badger), (2) the Multiple Species Conservation Plan wildlife infrastructure plan for State Route 94 between the Sweetwater River and Mallon Valley Road (mountain lion, badger, mule deer, and bobcat), and (3) Interstate 8 east of San Diego/El Cajon (mountain lion, mule deer, and California gnatcatcher) (CDFW 2022c).

Figure 2-13. San Diego Core Linkage and Habitat Areas



2.11.2. 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 (*Oncorhynchus mykiss*). Most salmon and steelhead in California are listed as either threatened or endangered, and barriers on the SHS further block fish from gaining access to upstream habitat.

SHC § 156.1 requires Caltrans to:

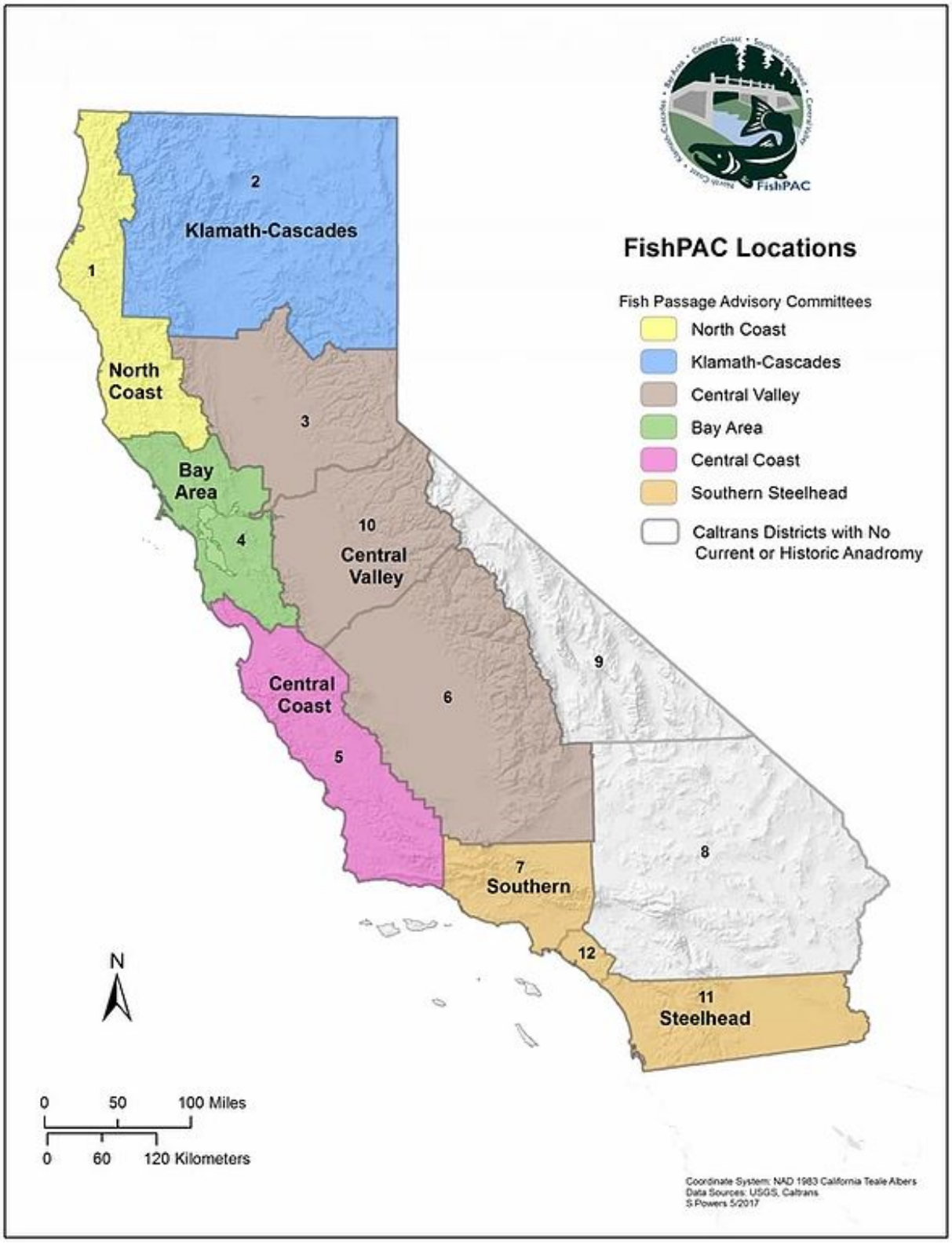
1. Provide an annual list of fish passage priorities for the SHS to the legislature. Fish Passage Annual Reports are available on the Caltrans Legislative Affairs website, with the most recent report at: https://dot.ca.gov/programs/legislative-affairs/reports.
2. Complete assessments of potential barriers 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 be 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 (*Oncorhynchus tshawytscha*), 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 2-14 shows the six California Fish Passage Advisory Committee ("FishPAC") locations throughout the state. The FishPAC is a partnership between Caltrans, CDFW, NMFS, FWS, CCC, CalTrout, 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 2-14. 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.

FishPACs help advance the desired outcomes of legislative guidance included in the SHC and promote collaborative interjurisdictional solutions. Long-term, full-span fish passage solutions are key to enhancing connectivity for both aquatic and terrestrial species in California's watersheds. Providing access to upstream habitats will help ensure fish populations can respond and adapt to climate change stressors such as drought, wildfire, sea-level rise, changes in stream flow, and water temperature. The FishPAC network of more than 200 fish passage experts, advocates, and partners throughout the range of salmon and steelhead work collaboratively to address legacy transportation barriers with long-term solutions that facilitate both fish passage and climate resilience.

The FishPAC helps Caltrans advance the desired outcomes of SHC § 156 (J. Walth, Caltrans, personal communication, 2020). Since 2006, in collaboration with FishPAC, Caltrans has partially or fully remediated 51 barriers on the SHS and identified 556 additional barriers to salmon and steelhead statewide. Results of Caltrans and FishPAC's efforts to locate, assess, prioritize, and remediate fish passage barriers on the SHS are documented in the 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.[2] Information regarding verified SHS fish passage barriers is available through the appropriate FishPAC.

2.12 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 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.

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 and the Water Boards (SWRCB and the RWQCBs) do not exclusively use HUC-8 codes

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

(California Department of Water Resources 2016). The Water Boards also use the Calwater system (that is, hydrologic units, or "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.

Table 2-4 provides a crosswalk between the HUC-8 and HU classifications systems for each HUC-8 in the GAI. The GAI includes the entirety of the San Diego sub-basin, loosely corresponding to the Anza Borrego, Carlsbad, Otay, Peñasquitos, Pueblo San Diego, San Diego, San Diego Bay, San Dieguito, San Luis Rey, Sweetwater, and Tijuana HUs. Figure 2-15 shows the sub-basin and state-level HUs in the GAI.

Table 2-4. Crosswalk of HUC-8 Sub-basins with HUs in the GAI

HUC-8 #	HUC-8 Name	HUC-8 Acreage[a]	HU #	HU Name[a]	HU Acreage[a]
18070304	San Diego	885,304	722	Anza Borrego	676,832
18070304	San Diego	885,304	905	Carlsbad	232,343
18070304	San Diego	885,304	910	Otay	98,384
18070304	San Diego	885,304	906	Peñasquitos	182,270
18070304	San Diego	885,304	907	Peñasquitos	282,476
18070304	San Diego	885,304	908	Pueblo San Diego	37,548
18070304	San Diego	885,304	907	San Diego	282,476
18070304	San Diego	885,304	912	San Diego Bay	153,480
18070304	San Diego	885,304	905	San Dieguito	232,343
18070304	San Diego	885,304	906	San Dieguito	182,270
18070304	San Diego	885,304	903	San Luis Rey	591,637
18070304	San Diego	885,304	909	Sweetwater	146,787
18070304	San Diego	885,304	911	Tijuana	156,638

Source: Caltrans 2021b
[a] HU names were extracted from RWQCB data layers; some HUs have the same names.
[b] Numbers were rounded to the nearest whole number and include the area within each sub-basin outside the GAI.

2.13 Hydrology

The San Diego Sub-basin of the GAI drains an area of approximately 885,304 acres (1,383 square miles) (Table 2-5). This sub-basin in the GAI includes 1,516 rivers and streams that traverse 1,770 miles in the San Diego and Colorado River Basin RWQCB boundaries (Table 2-5, Figure 2-15). Descriptions of these HUs, which may include water features outside the GAI, are provided below.

Figure 2-15. HUC-8 Sub-basins and HUs

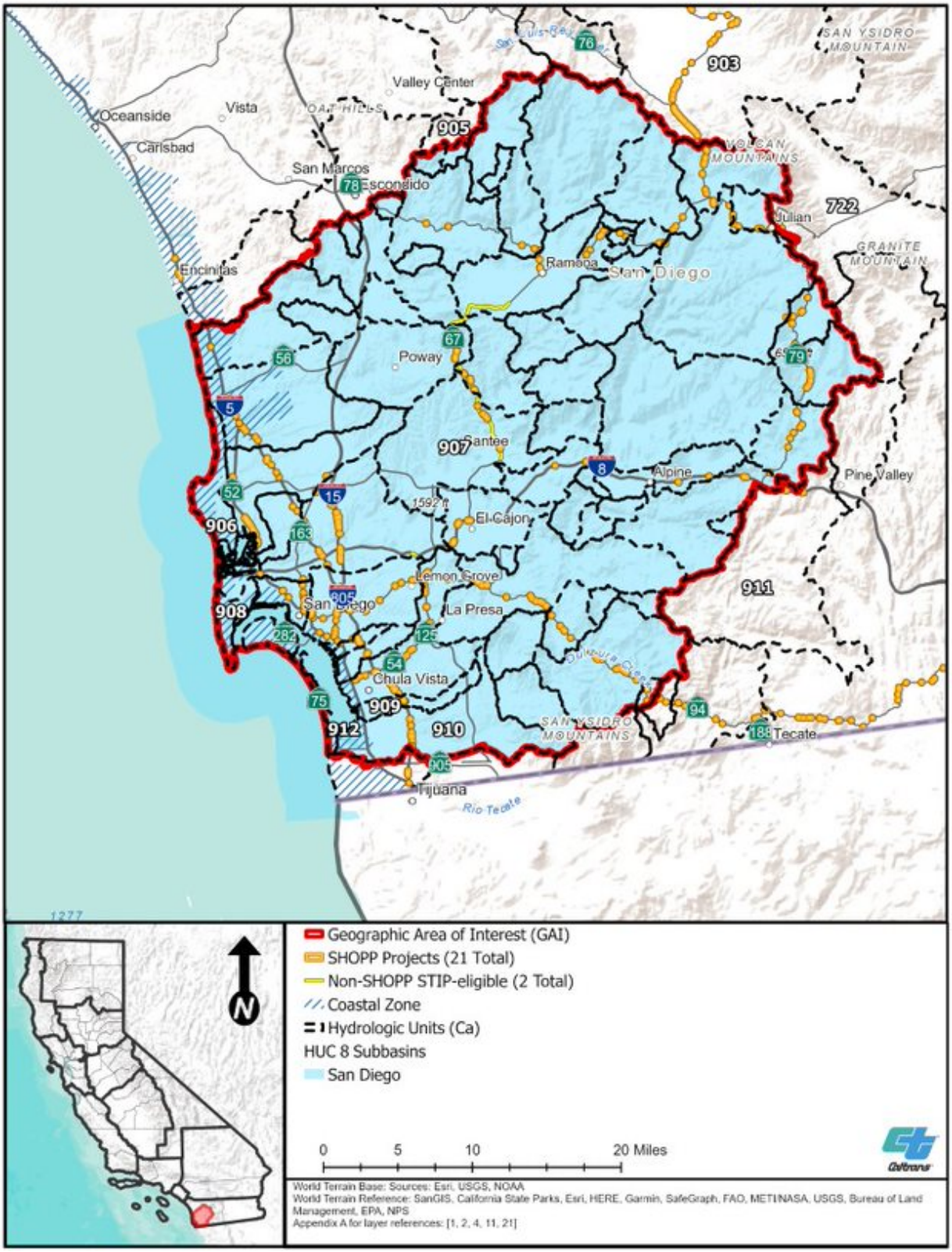


Table 2-5. Sub-basins

Sub-basin Name	Sub-basin Code (HUC-8)	Drainage Area (acres)[a]	Rivers and Streams (count)	Total Reach Length (miles)[a]
San Diego	18070304	885,304	1,516	1,770
Not applicable	**Total**	**855,304**	**1,516**	**1,770**

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

Anza Borrego HU. The Anza Borrego HU is primarily associated with desert springs. Perennial flow includes reaches of the Coyote and San Felipe Creeks, which drain to the Salton Sea (Colorado River Basin RWQCB 2019). The part of the Anza Borrego HU that lies within the San Diego sub-basin includes portions of the Mason and San Felipe hydrologic areas.

Carlsbad HU. The Carlsbad HU is associated with the Carlsbad Watershed Management Area. Waters originate approximately 24 miles northeast of Lake Wohlford on the east, ultimately discharging into the Pacific Ocean on the west. Major surface water features include four coastal lagoons (Buena Vista, Agua Hedionda, Batiquitos, and San Elijo), three major creeks, and two large water storage reservoirs (San Diego RWQCB 2018). The area is drained by Buena Vista, Agua Hedionda, San Marcos, and Escondido Creeks (San Diego RWQCB 2021). The part of the Carlsbad HU that lies within the San Diego sub-basin includes a portion of the Escondido Creek hydrologic area.

Otay HU. The Otay HU is associated with the Otay River and its major tributaries. The HU is located in southern San Diego County. The Otay River drains the San Ysidro and Jamul Mountains, ultimately discharging into the Pacific Ocean. Major tributaries to the Otay River include Jamul Creek, Dulzura Creek, and Poggi Creek (San Diego RWQCB 2007a). This HU includes the Lower Otay Reservoir (San Diego RWQCB 2021). The part of the Otay HU that lies within the San Diego sub-basin includes portions of the Coronado, Dulzura, and Otay Valley hydrologic areas.

Peñasquitos HU. The Peñasquitos HU is associated with a collection of coastal watersheds. Waters drain from Iron Mountain to the Pacific Ocean via Mission Bay and Los Peñasquitos Lagoon. Los Peñasquitos Creek is the largest stream in the HU; its major tributaries include Beeler Creek, Rattlesnake Creek, Sabre Springs, Chicarita Creek, Soledad Canyon, Poway Creek, and Lopez Creek. Los Peñasquitos Creek, Carroll Canyon Creek, and Carmel Creek, which drain into Los Peñasquitos Lagoon. Tecolote Creek and Rose Creek drain into Mission Bay and other unnamed tributaries drain directly into the Pacific Ocean (San Diego RWQCB 2007b). This HU includes two coastal lagoons. Los Peñasquitos Lagoon is located at the mouth of Peñasquitos Creek and empties into the Pacific Ocean near the northern border of the City of San Diego. Mission Bay is located at the mouth of the San Diego River (San Diego RWQCB 2021). The part of the Peñasquitos HU that lies within the San Diego sub-basin includes portions of the

Miramar, Miramar Reservoir, Poway, Scripps, Tecolote, Fiesta Island, Mission Bay, and Vacation Isle hydrologic areas.

Pueblo San Diego HU. The Pueblo San Diego HU is associated with a small collection of coastal watersheds that drain from the Paradise Mountains into the Pacific Ocean at San Diego Bay. This HU includes Chollas, Paradise, Powerhouse, and Paleta Creeks, and Chollas Reservoir (San Diego RWQCB 2008a). The part of the Pueblo San Diego HU that lies within the San Diego sub-basin includes portions of the National City, Point Loma, and San Diego Mesa hydrologic areas.

San Diego HU. The San Diego HU is associated with the San Diego River watershed. The headwaters originate within the Cuyamaca Mountains, over 6,000 feet above mean sea level, flowing approximately 52 miles west, discharging into the Pacific Ocean at Ocean Beach. Major water bodies in the HU include the San Diego River, Boulder Creek, Alvarado Creek, Forester Creek, Lake Murray, and the Cuyamaca, El Capitan, Jennings, and San Vicente Reservoirs (Project Clean Water 2021a). The part of the San Diego HU that lies within the San Diego sub-basin includes portions of the Boulder Creek, El Capitan, Lower San Diego, and San Vicente hydrologic areas.

San Diego Bay HU. The San Diego Bay HU is primarily associated with the San Diego Bay watershed, the primary outlet for the Pueblo San Diego, Sweetwater, and Otay watersheds (San Diego RWQCB 2016).

San Dieguito HU. The San Dieguito HU is associated with the San Dieguito River and its tributaries, including Santa Ysabel and Santa Maria Creeks. The HU contains two major reservoirs, Lake Hodges and San Dieguito Reservoir, and one coastal lagoon, San Dieguito Lagoon (San Diego RWQCB 2021). The part of the San Dieguito HU that lies within the San Diego sub-basin includes portions of the Hodges, San Pasqual, Santa Maria Valley, Solana Beach, and Santa Ysabel hydrologic areas.

San Luis Rey HU. The San Luis Rey HU is associated with the San Luis Rey watershed. The headwaters of the San Luis Rey River originate within the Palomar and Hot Springs Mountains, flowing approximately 55 miles west across northern San Diego County, ultimately draining to the Pacific Ocean in the City of Oceanside. Major aquatic features include the San Luis Rey River, Lake Henshaw, and Loma Alta Slough (San Diego RWQCB 2015). The part of the San Luis Rey HU that lies within the San Diego sub-basin includes portions of the Monserate and Warner Valley hydrologic areas.

Sweetwater HU. The Sweetwater HU is associated with the Sweetwater watershed. There are four major water bodies, including Sweetwater River, Sweetwater Reservoir, Loveland Reservoir, and the San Diego Bay (Project Clean Water 2021b). The part of the Sweetwater HU that lies within the San Diego sub-basin includes portions of the Lower, Middle, and Upper Sweetwater hydrologic areas.

Tijuana HU. The Tijuana HU is the northern portion of the Tijuana River watershed, which extends from the peninsular mountain ranges, including the Cuyamacas, to the Pacific Ocean south of San Diego Bay (San Diego RWQCB 2008b). It is drained by Cottonwood

and Campo Creeks, which are tributaries to the Tijuana River. The Tijuana Estuary is the only coastal lagoon in this HU (San Diego RWQCB 2021). The part of the Tijuana HU that lies within the San Diego sub-basin includes portions of the Barrett Lake, Monument, Potrero, and Tijuana Valley hydrologic areas.

2.14 Flood Hazard Areas

As designated by the Federal Emergency Management Agency, a Special Flood Hazard Area is defined as the area of land that is covered by the floodwaters of a 100-year base flood (Federal Emergency Management Agency 2021). In accordance with Executive Order 11988, all federally approved projects that encroach into a 100-year base floodplain must try to:

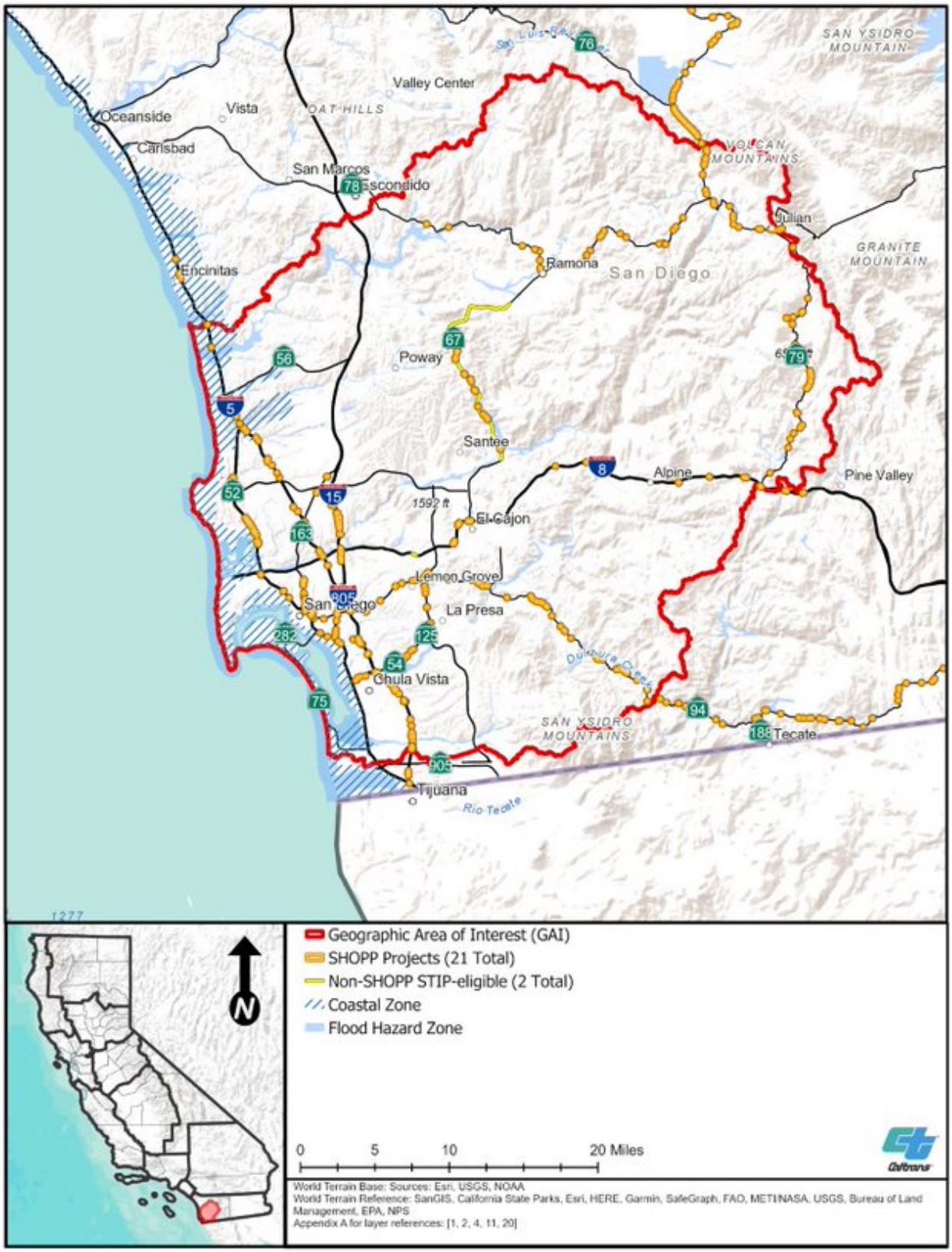
- avoid support of incompatible floodplain development,
- minimize the impact of highway actions that adversely affect the base floodplain,
- restore and preserve natural and beneficial floodplain values, and
- be consistent with the standards/criteria of the National Flood Insurance Program of the Federal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

Flood hazard areas in the GAI are shown on Figure 2-16. Water bodies associated with the majority of flood hazard risk in the GAI include San Elijo Lagoon, Escondido Creek, Lake Hodges, San Dieguito Lagoon, Los Peñasquitos Lagoon, Peñasquitos Creek, Mission Bay, San Diego River, San Diego Bay, Sweetwater River, Sweetwater Reservoir, and Otay River. This information is important for scoping advance mitigation projects and transportation projects undertaken within the GAI, which will need to comply with Executive Order 11988.

2.15 Water Quality

Water quality objectives for surface waters and groundwater in the GAI are provided in the San Diego and Colorado River Basin Plans that cover the GAI (Colorado River RWQCB 2019; San Diego RWQCB 2016). 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.

Figure 2-16. Flood Hazard Areas



Beneficial uses[3] for surface waters, groundwater, and coastal features are also identified in the Basin Plans (Colorado River RWQCB 2019; San Diego RWQCB 2016). If it cannot be avoided, a waterbody's beneficial uses may be affected by the construction, operation, and maintenance of highways and bridges. Impacts on wildlife and aquatic resources can be adverse or beneficial. An example of an adverse impact would be the introduction of a variety of pollutants, including sediments, heavy metals, hydrocarbons, and toxic substances (EPA 2005). An example of a beneficial impact would be repairs or retrofits that improve permeability or flows. Therefore, this RAMNA considers beneficial uses identified for waterbodies located in the GAI relevant to the RAMNA when they support the preservation and enhancement of wildlife habitat and aquatic resources and are consistent with the AMP's objective to protect natural resources through transportation project mitigation (Table 2-6).

Table 2-6. Beneficial Uses

Beneficial Use	San Diego Basin Plan	Colorado River Basin Plan	Relevant to RAMNA?[a]
Agricultural Supply	Applicable	Applicable	No
Aquaculture	Applicable	Not applicable	Yes
Cold Freshwater Habitat	Applicable	Applicable	Yes
Commercial and Sport Fishing	Applicable	Not applicable	Yes
Estuarine Habitat	Applicable	Not applicable	Yes
Freshwater Replenishment	Applicable	Applicable	Yes
Groundwater Recharge	Applicable	Applicable	Yes
Hydropower Generation	Applicable	Not applicable	No
Industrial Process Supply	Applicable	Not applicable	No
Industrial Service Supply	Applicable	Not applicable	No
Marine Habitat	Applicable	Not applicable	Yes
Migration of Aquatic Organisms	Applicable	Not applicable	Yes
Municipal and Domestic Supply	Applicable	Not applicable	No
Navigation	Applicable	Not applicable	No
Non-Contact Water Recreation	Applicable	Applicable	No
Preservation of Areas of Special Biological Significance	Applicable	Not applicable	Yes
Rare, Threatened, or Endangered Species	Applicable	Applicable	Yes

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

Beneficial Use	San Diego Basin Plan	Colorado River Basin Plan	Relevant to RAMNA?[a]
Shellfish Harvesting	Applicable	Not applicable	No
Spawning, Reproduction, and/or Early Development	Applicable	Not applicable	Yes
Warm Freshwater Habitat	Applicable	Applicable	Yes
Water Contact Recreation	Applicable	Applicable	No
Wildlife Habitat	Applicable	Applicable	Yes

Sources: Colorado River RWQCB 2019; San Diego RWQCB 2016
[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/or reduce scour, thereby improving water quality. Similarly, culvert replacement projects that increase flow and capacity would also reduce scour and improve sediment transport, resulting in improved channel function and flow and improved water quality.

The CWA Section 303(d) list of impaired waters includes 47 water bodies in the GAI, including multiple locations along Mission Bay, San Diego Bay, and the shoreline of the Pacific Ocean (SWRCB 2021). This RAMNA considers a water body's CWA Section 303(d) impairment designation as relevant to the RAMNA when it indicates a water body's loss of a relevant aquatic resource-related beneficial use (Table 2-6). These water bodies, their impairments, and whether total maximum daily loads 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.

2.16 Wild and Scenic Rivers

The purpose of the federal Wild and Scenic Rivers Act of 1968 (16 USC Chapter 28) and the California Wild and Scenic Rivers Act of 1972 (Public Resources Code § 5093.50) is to protect and enhance the wild, scenic, and recreational values of designated rivers (National Wild and Scenic Rivers System 2021; Water Education Foundation 2021). Rivers designated under the Wild and Scenic Rivers Act are classified as wild, scenic, or recreational. Wild river areas include rivers or sections of rivers that are free of impoundments, inaccessible except by trail, and have unpolluted waters. Scenic river areas include rivers or sections of rivers that are free of impoundments, have relatively undeveloped shorelines, and are accessible in some places by roads. Recreational river

areas include rivers or sections of rivers that are readily accessible by road or railroad, have some development along shorelines, and may have impoundments or diversions.

No nationally or state designated wild and scenic rivers are found in the GAI (National Wild and Scenic Rivers System 2021; Omnibus Public Land Management Act of 2009).

2.17 Aquatic Resources

A high-level view of major aquatic resources in the GAI is provided on Figure 2-17, 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, Water Boards, and/or CDFW regulations, as well as special-status fish that may be subject to CCC, CDFW, FWS, and/or NMFS regulations. Riparian habitat is discussed separately in Section 2.18.

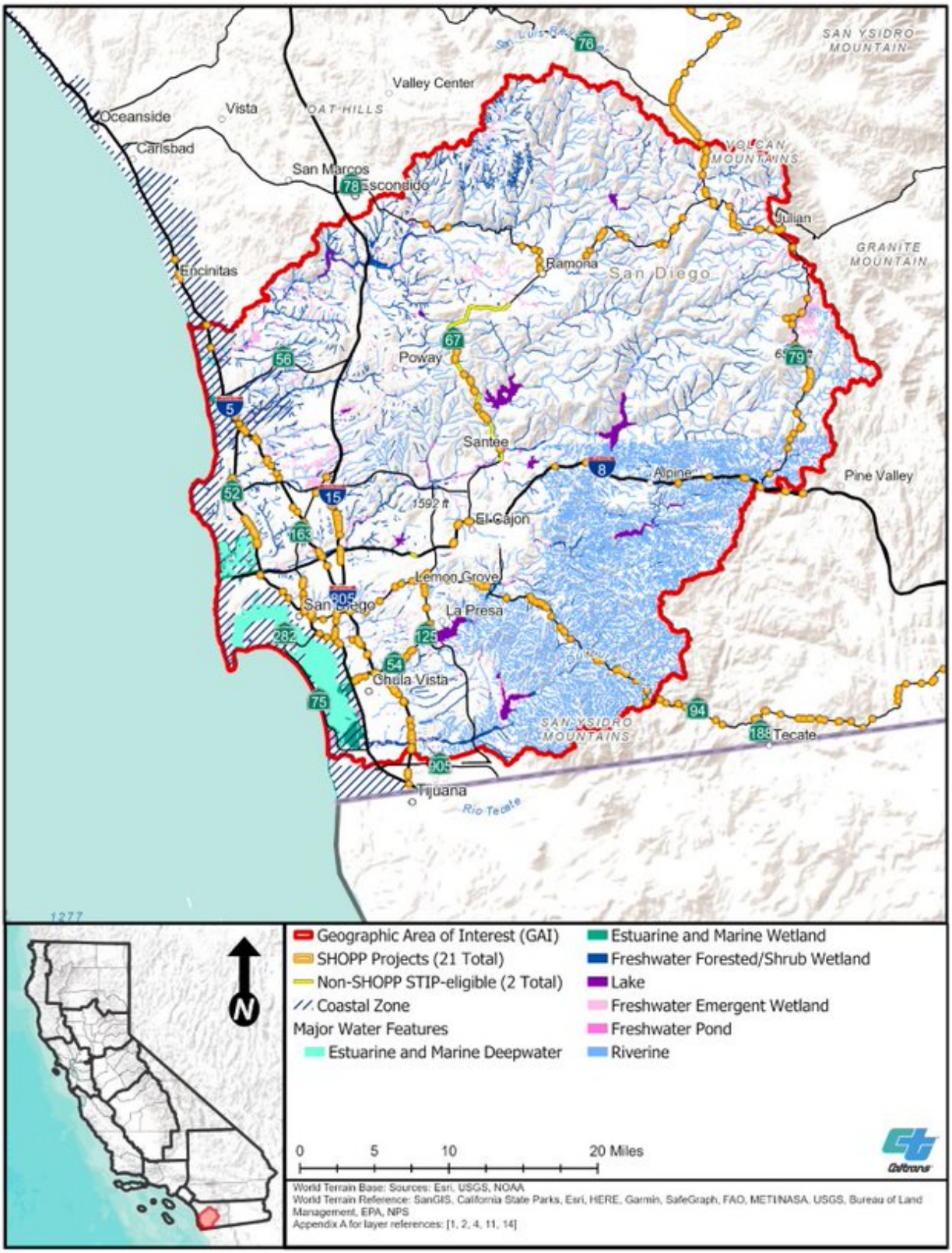
The CCC regulates impacts on coastal wetlands and marine and aquatic resources, and these resources receive special protections under Coastal Act § 30230 et seq. Corps and EPA jurisdiction under Section 404 of the CWA includes any activity that may cause a discharge of dredged or fill material into waters 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. The Water Boards' jurisdiction includes any activity that may cause a discharge of waste to waters of the state, including WOTUS, rivers, streams, and lakes, 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[4]; use material from any river, stream, or lake; and deposit or dispose of material into any river, stream, or lake.

2.17.1. Historical Context

Historically, approximately 57 percent of the estuarine wetlands, including vegetated wetlands, unvegetated wetlands, and subtidal water, along the southern California coast occurred along the San Diego coast associated with the San Diego Sub-basin, mostly associated with Mission and San Diego Bays (Stein et al. 2014). Since 1850, approximately 31 percent of historical estuarine habitat in this area has been lost, with vegetated wetlands experiencing the greatest loss followed by unvegetated wetlands. In contrast, subtidal habitats have increased by 5 percent during the same time period. These losses resulted from a combination of development pressure, shoreline erosion, changes in water and sediment production, and effects of sea-level rise.

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

Figure 2-17. Aquatic Resource Features and Major Stream Systems[a]



[a] For greater detail, see Appendix G.

Approximately 70 percent of these losses involved conversion to non-wetland land uses and 30 percent involved conversion to a different estuarine habitat type or non-tidal wetland. Currently, estuarine habitats consist of 71 percent subtidal habitats, 19 percent vegetated habitats, and 10 percent unvegetated habitats (Stein et al. 2014).

Over the past century, the San Dieguito Lagoon has been heavily modified with levees and earthen dikes to manage flows and lands near the Del Mar Fair Grounds, which have been filled in to support expansion of development (Mira Costa College 2020). The installation of dams including, but not limited to, Lake Hodges Dam, Mission Dam, San Vicente Dam, and Savage Dam have altered waterways and the natural flood regime within the San Diego Sub-basin to satisfy the high demand for water (Project Clean Water 2021c). Prior to the construction of Lake Hodges Dam in 1918, the San Dieguito River would carry sediment downstream to lagoons, riparian habitat, and beaches in Solana Beach and Del Mar during seasonal flood events, but now downstream areas are rockier with minimal sand and gravel (Mira Costa College 2020).

Rapid urbanization in the Los Peñasquitos watershed has increased the area of surfaces impervious to absorbing rainwater, stormwater runoff, and flood magnitude, and has changed stream channel morphology (White 2006). In addition, because of increased sedimentation, freshwater runoff from landscaping, and wastewater treatment, more freshwater and associated sediment enters the lagoon year-round than it did historically. This has led to salt and brackish marsh habitat at the lagoon outlet converting to freshwater habitat when the lagoon inlet is closed. Contaminant and salinity levels have increased near the often-closed inlet, resulting in fish kills (Caltrans and SANDAG 2016).

Because more than 69 percent of the Otay River occurs above the Savage Dam and Otay Reservoir, the structures retain nearly all the bed sediment from the upper part of the watershed, causing a distortion in sediment equilibrium. The sediment deficiency within the lower reaches of the Otay River can cause channel degradation. In addition, urbanization of the lower Otay River has resulted in increased impervious cover, increased flood and erosion potential, channel degradation, and a modified hydrologic regime (Aspen Environmental Group 2006). Other watersheds within the San Diego Sub-basin that have become highly urbanized over the past 100 years are likely to have been similarly affected.

2.17.2. 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 (2016) California Aquatic Resource Inventory (Table 2-7, Appendix G; Caltrans 2021d). These data were used to estimate the extent of wetlands in the GAI; however, the data layers are largely based on aerial imagery, have not been ground-truthed, provide no information on plant species associated with mapped areas, and, hence, are relatively coarse. Although suitable for advance mitigation project scoping, site-specific wetland studies that result in more detailed mapping and classification of wetland aquatic resources would be required for advance mitigation

projects to establish compensatory mitigation credits. For example, under Section 404 of the CWA, in typical cases, 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 2.6; therefore, total acreages of wetland land cover types presented in Table 2-3 may not align with those presented in Table 2-7 (Caltrans 2021d).

Table 2-7. Wetland and Non-wetland Water Types in the GAI

Type	San Diego (acres) 18070304
Depressional Perennial Natural Emergent	<0.1
Depressional Perennial Natural Non-vegetated	0.1
Depressional Perennial Natural Vegetated	<0.1
Depressional Perennial Unnatural Emergent	0.1
Depressional Perennial Unnatural Non-vegetated	7.3
Depressional Perennial Unnatural Vegetated	<0.1
Depressional Seasonal Natural Emergent	381.4
Depressional Seasonal Natural Forested	79.8
Depressional Seasonal Natural Non-vegetated	4.9
Depressional Seasonal Natural Shrub-Scrub	71.6
Depressional Seasonal Unnatural Emergent	41.9
Depressional Seasonal Unnatural Forested	0.3
Depressional Seasonal Unnatural Non-vegetated	2.7
Depressional Seasonal Unnatural Shrub-Scrub	0.8
Estuarine and Marine Deepwater	13,033.4
Estuarine and Marine Wetland	2,968.3
Estuarine Saline Natural Intertidal Non-vegetated	<0.1
Estuarine Saline Natural Subtidal Non-vegetated	<0.1
Freshwater Emergent Wetland	4,843.4
Freshwater Forested/Shrub Wetland	6,846.8
Freshwater Forested/Shrub Wetland/Depressional Perennial Unnatural Non-vegetated	<0.1
Freshwater Pond	1,297.5

Type	San Diego (acres) 18070304
Lacustrine Unnatural Emergent	0.4
Lacustrine Unnatural Non-vegetated	10.7
Lake	5,640.7
Riverine	7,673.9
Total[a]	**42,906.2**

Sources: Caltrans 2021d, 2021e

Coastal Wetlands

Caltrans did not find any spatial data for the GAI that display "coastal wetlands" as defined by the CCC, in accordance with Public Resources Code § 30121 [14 California Code of Regulations § 13577(b)], which is a broader category that may include aquatic resources that the Corps would not define as wetlands. The SAMNA Reporting Tool's wetland layer does not report on coastal wetlands that meet the CCC's definition. It is likely that, if located in the coastal zone, all of the wetland types identified in Table 2-7 would be classified as coastal wetlands. An unknown additional number may also meet the definition of coastal wetland using the CCC's criteria; identification would have to occur in the field.

2.17.3. 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 2-7, Appendix G; Caltrans 2021e). Although suitable for advance mitigation project scoping, site-specific studies that result in more detailed mapping and classification of other, non-wetland aquatic resources would be required for advance mitigation projects to establish compensatory mitigation credits. Similar to the wetlands data, the waters data layer is separate from the land cover types discussed previously in Section 2.6; therefore, total acreages of water land cover types presented in Table 2-3 may not align with those presented in Table 2-7 (Caltrans 2021e).

2.17.4. Threatened and Endangered Fish Species

Special-status terrestrial species with the potential to occur in the GAI are discussed in Section 2.8. 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 2023, 2021f). Based on a search of the fish habitat layer, two federally or state listed threatened or endangered fish species have the potential to occur in the GAI:

- federally endangered Southern California DPS steelhead (*Onchorhynchus mykiss irideus*)

- federally endangered tidewater goby (*Eucyclogobius newberryi*)

The GAI does not include FWS- or NMFS-designated final critical habitat for federally listed fish species. Although the San Luis Rey River, San Dieguito River, San Diego River, Sweetwater River, Otay River, and Tijuana River watersheds in the GAI provide suitable habitat for Southern California DPS steelhead, the only rivers and creeks in San Diego County known to support steelhead in the last 50 years are San Mateo Creek and the San Luis Rey River, both of which occur outside the GAI. Las Pulgas Creek, Hidden Creek, French Lagoon, Cockleburr Canyon, and Santa Margarita River support tidewater goby; however, these water features are located north of the GAI and there are no water features within the GAI known to support tidewater goby.

Although it is the best information currently available, the SAMNA Reporting Tool's fish species list is uncertain (Caltrans 2023). 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.

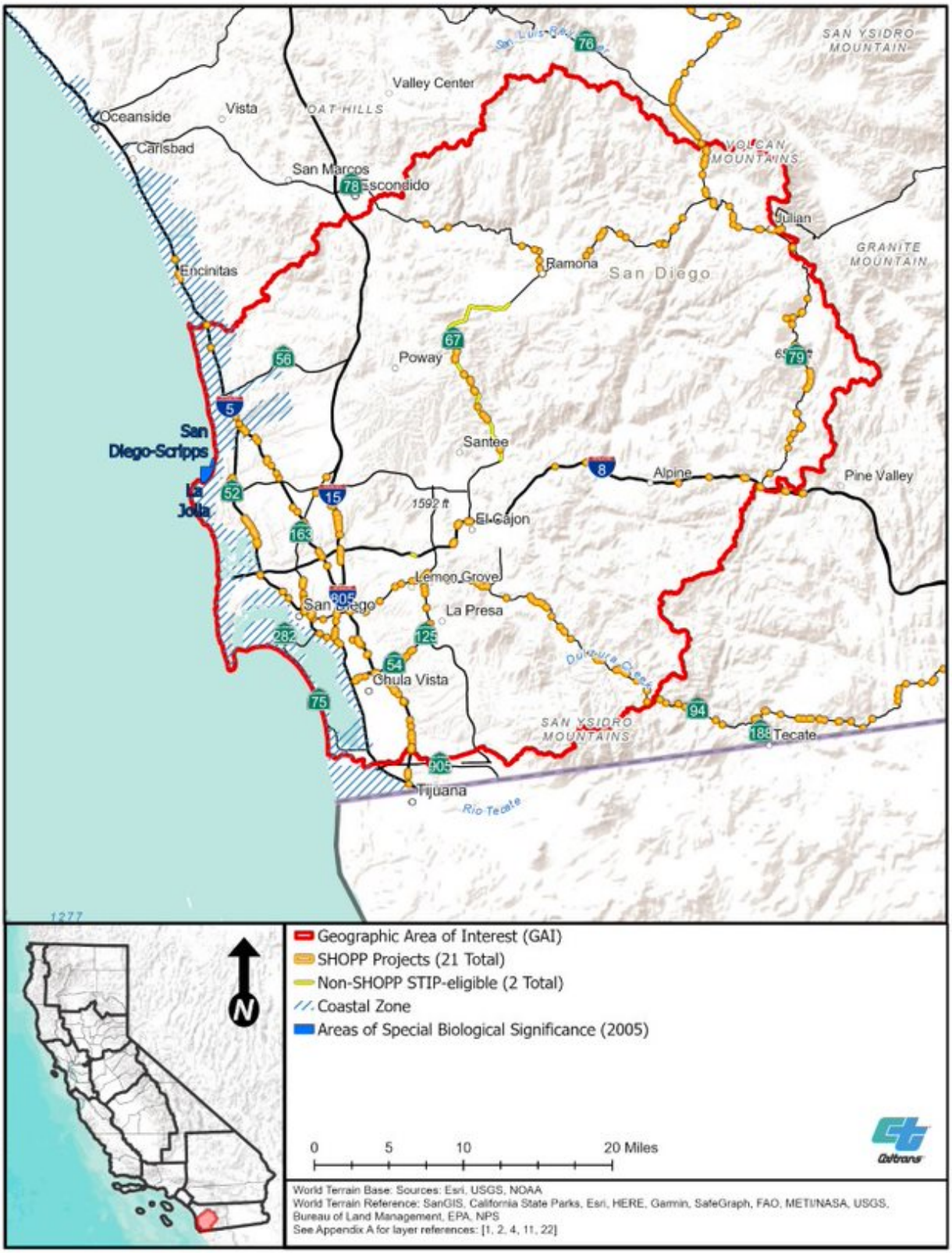
2.18 Riparian Habitat

Riparian habitats may include portions that are wetlands or non-wetland waters, but they also may be outside of these categories. California does not have a GIS layer for riparian ecotones and the natural resource regulatory agencies with authority in California do not have a definition for riparian habitat. Nevertheless, CWHR does include three riparian habitat types: montane riparian, valley foothill riparian, and desert riparian, which are included in the SAMNA's terrestrial vegetation data layer (Caltrans 2021c). In the GAI, riparian habitat types are a subset of the land cover types in Table 2-3 and include montane riparian and valley foothill riparian.

2.19 Areas of Special Biological Significance

The California Ocean Plan, originally adopted by SWRCB in 1972 and updated most recently in 2019, establishes water quality objectives for ocean waters and provides the basis for the regulation of wastes discharged into coastal waters from both point and non-point sources (SWRCB 2019a). It defines ASBS as "those areas designated by the SWRCB as ocean areas requiring protection of species or biological communities…" and requires that waste be discharged a sufficient distance from an ASBS to ensure "maintenance of natural water quality" (SWRCB 2019a). According to Resolution Nos. 74-28, 74-32, and 75-61, SWRCB designated 34 ocean areas along the coast of California as ASBS (SWRCB 2019a). These areas typically support a variety of aquatic life and often host unique individual species (SWRCB 2017). Figure 2-18 shows ASBS located in proximity to the GAI. From north to south, the GAI's coastline is adjacent to the following ASBSs: (1) San Diego-Scripps ASBS, which occupies approximately 0.6 mile of shoreline in the city of San Diego, and (2) La Jolla ASBS, which occupies approximately 1.7 miles of shoreline adjacent to the city of San Diego (SWRCB 2017).

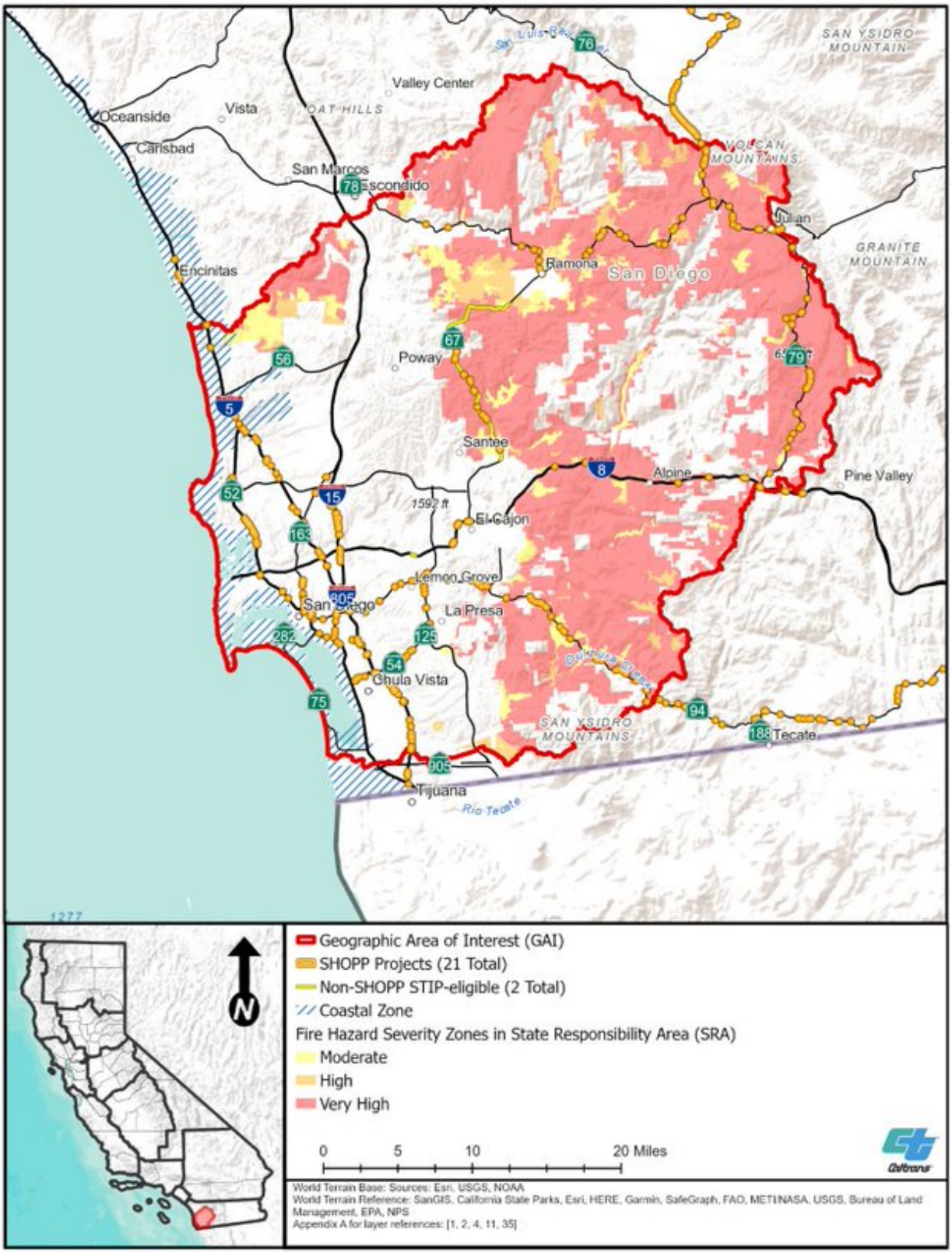
Figure 2-18. Areas of Special Biological Significance in Relation to the GAI



2.20 Fire Hazard Severity Zones

The California Department of Forestry and Fire Protection prepares Fire Hazard Severity Zone maps that classify the severity of fire hazards in California (Figure 2-19). 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 2-19, high and very high fire hazard severity zones in the GAI primarily occur in the central, northern, and eastern part of the GAI at higher elevations. 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 2-19. Fire Hazard Severity Zones



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3. RELEVANT PLANS, POLICIES, AND REGULATIONS

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

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

- Reference document title
- Status:
  - Final: 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. For example, LCPs are updated frequently. 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 11 based on the SAMNA results and other information. District 11 specifically identified compensatory mitigation for coastal California gnatcatcher, least

Bell's vireo, and aquatic resources as historical and anticipated mitigation needs. Therefore, Table 3-1 emphasizes documents related to the specified wildlife and aquatic resources, which, in turn, form the basis for the goals and objectives presented in Chapter 7, *Wildlife Resources Conservation Goals and Objectives*, and Chapter 8, *Aquatic Resources Conservation Goals and Objectives*. As much as practicable, however, Caltrans intends for any compensatory mitigation established in the GAI to support these specific wildlife and aquatic resources to benefit other wildlife and aquatic resources 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 Coastal Act of 1976	Updated periodically (by California legislature)	No	The California Coastal Act is the primary law that governs decisions of the CCC. It outlines, among other things, standards for development within the coastal zone. The California Coastal Act requires mitigation for impacts on coastal habitats and other types of coastal resource impacts—for example, visual impacts—that are outside the scope of this document. The CCC regulates potentially impactful projects within the coastal zone, primarily through the issuance of CDPs. In coastal local jurisdictions where the CCC has certified an LCP, the local government assumes CDP authority within its jurisdiction (with certain exceptions, such as some coastal wetlands, where the CCC retains original jurisdiction). LCPs are used by local governments to guide development in the coastal zone in coordination with the CCC. LCPs that overlap the GAI are listed in Appendix C, *Local Coastal Programs*.	https://www.coastal.ca.gov/coastact.pdf	10/9/2019 (last amended)
California Fish and Game Commission Wetlands Resources Policy	Updated periodically	No	California Fish and Game Commission's policy to seek to provide for the protection, preservation, restoration, enhancement, and expansion of wetland habitat in California.	https://fgc.ca.gov/About/Policies/Miscellaneous#Wetlands	8/18/2005 (last amended)
California Water Boards 2010 Update to Strategic Plan 2008–2012	Final	No	Update to strategic plan from the Water Boards. Goals include implementing strategies to fully support beneficial uses for all water bodies listed in the 2006 report, improve and protect groundwater quality, increase sustainable local water supplies available for meeting beneficial uses by 1,725,000 acre-feet per year, comprehensively address water quality protection and restoration, improve transparency and accountability within the Water Boards, enhance consistency across the Water Boards, and ensure that the Water Boards have access to information and expertise.	https://www.waterboards.ca.gov/water_issues/hot_topics/strategic_plan/docs/2010/final_strategic_plan_update_report_062310.pdf	6/1/2010
CCC Regulations	Updated periodically	No	California Code of Regulations section that allows CCC to implement provisions of the Coastal Act.	https://www.law.cornell.edu/regulations/california/title-14/division-5.5	12/24/2021 (last updated)
CCC Sea Level Rise Policy Guidance	Updated periodically	No	CCC's policy guidance document for integrating development projects in the coastal zone with sea-level rise projections for LCPs and CDPs.	https://www.coastal.ca.gov/climate/slrguidance.html	11/7/2018 (last updated)
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 Fish and Game Code § 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)
Definition and Delineation of Wetlands in the Coastal Zone	Final	No	Implemented by the CCC. Serves as a reference guide to help interpret CCC law and regulations, which, in part, define wetlands. Summarizes a wetland definition, set forth in the Coastal Act and California Code of Regulations, Title 14, Division 5.5, that uses a one-parameter approach by which any of the three Corps' indicators constitutes a wetland. This document also includes wetland delineation procedures.	https://documents.coastal.ca.gov/reports/2011/10/W4-10-2011.pdf	10/5/2014
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 and allows the 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 Native Plant Protection Act prohibits take of endangered or rare native plants, but includes some exceptions for agricultural and nursery operations; 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

Title	Status	Spatial Data	Reference Purpose	Link	Date
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 of California Sea-Level Rise Guidance: 2018 Update	Final	No	Drafted by CNRA and OPC. Provides guidance to state agencies for incorporating sea-level rise projections into planning, permitting, investment, and other decisions.	https://www.opc.ca.gov/updating-californias-sea-level-rise-guidance/	3/14/2018
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	Final	No	Created by SWRCB and implemented by SWRCB and the RWQCBs. 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 Fish and Game Code § 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 Colorado River Region	Updated periodically	Yes	Implemented by Colorado River RWQCB. Establishes general and site-specific water quality objectives in the Colorado River Basin.	https://www.waterboards.ca.gov/colorador iver/water_issues/programs/basin_planning/	1/8/2019 (last updated)
Water Quality Control Plan for the San Diego Region	Updated periodically	Yes	Implemented by the San Diego RWQCB. Establishes general and site-specific water quality standards and objectives in the San Diego Region.	https://www.waterboards.ca.gov/sandiego/water_issues/programs/basin_plan/	9/1/2021 (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
Current Implementation of Waters of the United States	Updated periodically	No	EPA's website on the implementation and definition of WOTUS, based on the most current agency rulemaking and legal decisions.	https://www.epa.gov/wotus/current-implementation-waters-united-states	5/30/2023 (last updated)
CWA	Updated periodically (by Congress)	No	Authorized by EPA and delegated to the Corps and SWRCB, the CWA establishes the basic structure for regulating discharges of pollutants into WOTUS and regulating quality standards for surface waters.	https://www.law.cornell.edu/uscode/text/33/1344	2/4/1987 (last amended)

Title	Status	Spatial Data	Reference Purpose	Link	Date
CWA § 401	Updated periodically (by Congress)	No	Implemented by EPA and SWRCB. Regulates discharge of pollutants into WOTUS.	https://www.law.cornell.edu/uscode/text/33/1341	12/27/1977 (last amended)
CWA § 402 National Pollutant Discharge Elimination System 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 that is: ▪ owned by a state, city, town, village, or other public entity that discharges to WOTUS; ▪ designed or used to collect or convey stormwater (for example, storm drains, pipes, ditches); ▪ not a combined sewer; and ▪ not part of a sewage treatment plant, or publicly owned treatment works.	https://www.epa.gov/npdes/stormwater-discharges-municipal-sources	1/19/2019 (last amended)
CWA § 404	Updated periodically (by Congress)	No	Implemented by EPA and 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
Federal Climate Action Plans	Updated periodically	No	Action plans by the federal government to broadly address the effects of climate change. These plans are individually tailored to each federal department. Those plans pertinent to this RAMNA are under the Departments of Agriculture, Commerce, and Interior, as well as plans specific to the Corps and EPA.	https://www.sustainability.gov/adaptation/	1/1/2021
Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division	Final	No	Corps' guidelines for mitigation and monitoring in the South Pacific Division, including California.	https://www.spd.usace.army.mil/portals/13/docs/regulatory/mitigation/mitmon.pdf	12/19/2014 (last amended)
FWS Mitigation Policy	Final	No	FWS policy that builds upon the guidance in the 1981 Mitigation Policy for FWS recommendations and requirements on mitigating adverse impacts of land and water developments on fish and wildlife.	https://www.fws.gov/policy-library/A1501fw2	5/10/2023
FWS Endangered Species Act Compensatory Mitigation Policy	Final	No	FWS policy that adopts mitigation principles established in the FWS Mitigation Policy, establishes compensatory mitigation standards, and provides guidance for the application of compensatory mitigation through implementation of the ESA.	https://www.fws.gov/policy-library/a1501fw3	5/10/2023
National Wetlands Mitigation Action Plan	Final	No	EPA and Corps' comprehensive, interagency document to further achievement of the goal of no net loss of wetlands and to set forth the no net loss policy.	https://www.epa.gov/cwa-404/national-wetlands-mitigation-action-plan	12/26/2002
Section 10 of the Rivers and Harbors Appropriation Act of 1899	Updated periodically (by Congress)	No	Authorizes the Corps to protect navigable WOTUS by requiring a permit for construction of any structure over a navigable WOTUS. A Section 10 permit is required if the structure or work affects the course, location, or condition of the waterbody. The law applies to any dredging or disposal of dredged materials, excavation, filling, rechannelization, or any other modification of a navigable WOTUS.	https://www.epa.gov/cwa-404/section-10-rivers-and-harbors-appropriation-act-1899	7/26/1947 (last amended)
Section 14 of the Rivers and Harbors Appropriation Act of 1899	Updated periodically (by Congress)	No	This Act is also known as 33 USC Section 408 or, more simply, Section 408. Implemented by the Corps. Regulates the temporary occupation or use of any sea wall, bulkhead, jetty, dike, levee, wharf, pier, or other work built by the U.S.	https://www.law.cornell.edu/uscode/text/33/408a#a	10/23/2018 (last amended)
State Board Resolution No. 68-16	Final	No	Policy for maintaining high water quality.	https://www.waterboards.ca.gov/board_decisions/adopted_orders/resolutions/1968/rs68_016.pdf	10/28/1968

Title	Status	Spatial Data	Reference Purpose	Link	Date
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 Coastal Trail Mapping Viewer	In progress	Yes	GIS map created by CCC and the Coastal Conservancy showing existing segments of the California Coastal Trail. The majority of California Coastal Trail segments are located in public open space or the Caltrans right-of-way, and Caltrans is a statutory partner in maintaining and advancing the trail. Caltrans should be aware of any potential trail alignments when planning and designing mitigation projects.	https://the-california-coastal-trail-1-coastalcomm.hub.arcgis.com/	Updated frequently
California Eelgrass Mitigation Policy and Implementing Guidelines	Final	No	NMFS document describing its policy for mitigation of impacts on eelgrass habitats, which includes no net loss of eelgrass habitat.	https://www.fisheries.noaa.gov/resource/document/california-eelgrass-mitigation-policy-and-implementing-guidelines	10/1/2014
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	Prepared for CNRA and the California Bay-Delta Authority. Provides guidance for conducting a watershed assessment in California.	https://www.epa.gov/system/files/documents/2022-02/caliwam.pdf	5/1/2005
Caltrans Adaptation Strategies Report: District 11	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	12/1/2020
Caltrans Climate Change Vulnerability Assessment: District 11 Technical Report	Final	No	Caltrans assessment of climate change vulnerabilities for the District.	https://dot.ca.gov/programs/transportation-planning/division-of-transportation-planning/air-quality-and-climate-change/2019-climate-change-vulnerability-assessments	10/1/2019

Title	Status	Spatial Data	Reference Purpose	Link	Date
CCC Strategic Plan 2020–2025	Final	No	CCC draft to guide agency actions from 2020 to 2025. The plan currently contains 9 goals, 49 objectives, and 189 specific actions. Of these, Caltrans is identified in 16 specific actions, including coordination on biodiversity resources and advanced mitigation (3.1.3, 3.2.3, 3.2.4), climate change planning (4.1.2, 4.1.3, 4.1.4, 4.1.5, 4.3.1, 4.4.2), LCP engagement (6.1.3, 6.1.5, 6.2.1), environmental justice (5.2.1, 5.2.3), and information/GIS collaboration (8.1.1, 8.1.7, 9.6.2, 9.6.4).	https://www.coastal.ca.gov/strategicplan/spindex.html	11/6/2020
Coastal Storm Modeling System (CoSMoS)	Updated periodically	Yes	A tool developed by USGS to allow for detailed predictions of coastal flooding attributable to projected sea-level rise and storm systems. Includes projections of storm scenarios under different sea-level rise conditions. This system is integrated with the Our Coast Our Future: Coastal Storm Modeling System, noted below.	https://www.usgs.gov/centers/pcmsc/science/coastal-storm-modeling-system-cosmos?qt-science_center_objects=0#qt-science_center_objects	9/1/2021 (last piece added)
Conservation and Mitigation Banking	Updated periodically	No	CDFW's main public webpage describing the process for creating and using mitigation banks.	https://wildlife.ca.gov/Conservation/Planning/Banking	1/1/2022
Large Mammal-Vehicle Collision Hot Spot Analyses, California, USA	Final	Yes	Western Transportation Institute's report documenting the methods and results of hot spot analyses of large wild mammal-vehicle collisions in California, with an emphasis on mule deer. These analyses identified the road sections that had the highest concentration of deer-vehicle crashes and mule deer carcasses. Special-status species were not addressed.	https://westerntransportationinstitute.org/wp-content/uploads/2019/09/4W6693_Huijser-and-Begley-FINAL-Report-Caltrans-Statewide-20190913-reduced-image-size.pdf	9/13/2019
Master Plan for Marine Protected Areas	Final	No	CDFW's management plan for marine protected areas.	https://www.wildlife.ca.gov/Conservation/Marine/MPAs/Master-Plan	8/24/2016
Our Coast Our Future: Coastal Storm Modeling System	Updated periodically	Yes	A USGS mapping program tracking projected sea-level rise for the California coast. Some pieces of the program are not yet completed.	https://data.pointblue.org/apps/ocof/cms/	2016 (last piece added)
Pacific Coast Fishery Ecosystem Plan for the U.S. Portion of the California Current Large Marine Ecosystem	Final	Yes	Pacific Fishery Management Council's overarching plan for management of the marine ecosystem and fish population for the California coast.	https://www.pcouncil.org/managed_fishery/ecosystem-based-management/	7/1/2013
Restoring California's Wildlife Connectivity 2022: 2022 Priority Wildlife Connectivity Project Locations by Region	Final	Yes	CDFW's priority wildlife movement barriers across the state. This document is focused on large wild mammal game species; however, some priorities would benefit special-status species such as bighorn sheep.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=204648&inline	12/1/2022
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
Sanctuary Integrated Monitoring Network	Updated periodically	Yes	A NOAA-administered program to collect original research, gather historical records, and monitor and report on the condition of National Marine Sanctuaries in California.	https://sanctuarysimon.org/	Information updated regularly
Strategic Plan to Protect California's Coast and Ocean 2020–2025	Draft	Yes	OPC's plan for coastal and ocean protection. Includes goals and objectives centered on safeguarding coastal and marine ecosystems, advancing equity across ocean and coastal policies and actions, enhancing coastal and marine biodiversity, and improving ocean health with economic factors.	https://www.opc.ca.gov/webmaster/ftp/pdf/2020-2025-strategic-plan/OPC-2020-2025-Strategic-Plan-FINAL-20200228.pdf	2/28/2020

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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 Marine Resources Companion Plan	Final	Yes	CDFW's companion document to SWAP to assess the vulnerability and conservation strategies for the California coast and coastal waters.	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
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
Special-Status Taxa[a] Documents	See below	See below	See below	See below	See below
Coastal California Gnatcatcher Recovery Plan	Not applicable	Not applicable	No recovery plan for coastal California gnatcatcher currently exists.	https://ecos.fws.gov/ecp/species/8178	Not applicable
Coastal California Gnatcatcher 5-Year Review	Updated periodically	Yes	FWS' most recent formal review of the species condition.	https://ecos.fws.gov/ecp/species/8178	6/2/2020 (latest document)
Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule	Final	Yes	FWS' designation of critical habitat for the coastal California gnatcatcher.	https://ecos.fws.gov/ecp/species/8178	12/19/2007
Coastal California Gnatcatcher Biological Opinions	Updated periodically	No	FWS' list of the 124 most recent biological opinions that have been used for coastal California gnatcatcher, of which 68 were for projects in the GAI.	https://ecos.fws.gov/ecp/species/8178	12/2/2021 (latest document)
Coastal California Gnatcatcher Presence/Absence Survey Protocol	Final	No	FWS' current survey protocol for coastal California gnatcatcher.	https://fws.gov/media/coastal-california-gnatcatcher-presenceabsence-survey-protocol	6/26/2019
Draft Recovery Plan for the Least Bell's Vireo	Draft	Yes	FWS' draft recovery plan for least Bell's vireo. The recovery criteria pertinent to the GAI that must be achieved before delisting can occur are: ▪ Stable or increasing least Bell's vireo populations, each consisting of several hundred or more breeding pairs, protected at the Sweetwater River, San Diego River, Dulzura Creek, Jamul Creek, and Otay River. ▪ That the above trends occur for at least 5 consecutive years. ▪ That threats are reduced or eliminated so that least Bell's vireo populations are capable of persisting without significant human intervention.	https://ecos.fws.gov/ecp/species/5945	5/6/1998
Least Bell's vireo (*Vireo bellii pusillus*) 5-Year Review	Updated periodically	Yes	FWS' most recent formal review of the species condition.	https://ecos.fws.gov/ecp/species/5945	9/26/2006
Designation of Critical Habitat for the Least Bell's Vireo	Final	Yes	FWS' designation of critical habitat for least Bell's vireo.	https://ecos.fws.gov/ecp/species/5945	2/2/1994
Least Bell's Vireo Biological Opinions	Updated periodically	No	FWS' list of 110 most recent biological opinions that have been used for least Bell's vireo, of which 31 were for projects in the GAI.	https://ecos.fws.gov/ecp/species/5945	12/6/2021 (latest document)

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Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon	Final	Yes	FWS recovery plan for vernal pool species in California and Oregon, which includes 25 plants, 7 invertebrates, and 1 amphibian, for a total of 33 species. In general, recovery criteria center on habitat protection and adaptive habitat management, which includes developing management plans, conducting status surveys, finding populations to be at least maintaining their population if not increasing, conducting research, and having additional public outreach and participation. Some species-specific criteria exist, such as seed banking for plants and preferential transition from intensive agriculture to grazing near western spadefoot toad conservation areas. Sixteen regions are identified in this plan, along with 41 core areas.	https://ecos.fws.gov/docs/recovery_plan/060614.pdf	12/15/2005
Recovery Plan for Vernal Pools of Southern California	Final	Yes	FWS recovery plan for seven vernal pool species in Southern California including five plants and two aquatic invertebrates. In general, recovery criteria center on acquiring land where these species occur for conservation, enhancement or restoration at these pools occur such that populations of these species stabilize or increase, and that trends in stability or population growth must be sustained for 10 years.	https://sdmmp.com/download.php?cid=CID_ctamanah@usgs.gov_5761a1cecf3fd	9/1/1998
State Land Management Plans	See below	See below	See below	See below	See below
Cañada de San Vicente Land Management Plan	Final	Yes	California State Parks and CDFW Management plan for the CDFW-owned Cañada de San Vicente Ecological Reserve. Includes goals to enhance the 76 acres of riparian habitat in the reserve.	https://wildlife.ca.gov/Lands/Planning/Canada-de-San-Vicente	2/16/2016
Hollenbeck Canyon Wildlife Area Land Management Plan	Final	Yes	CDFW's management plan for the wildlife area. Includes goals as follows: ▪ Enhance water features at Hollenbeck Canyon, the upper reach of Jamul Creek, and the portion of Dulzura Creek near the Border Patrol check station; ▪ Target areas for eucalyptus removal and site restoration including the western segment of Jamul Creek within the wildlife area and Dulzura Creek near the old Honey Springs Ranch; ▪ Target areas for giant reed removal and site restoration including Dulzura Creek and an unnamed tributary in the Honey Springs Ranch parcel; and ▪ Target areas for riparian restoration including the unnamed tributary that flows into Hollenbeck Canyon in the west-central portion of the property where ongoing erosion has created a deep gully.	https://wildlife.ca.gov/Lands/Planning/Hollenbeck-Canyon-WA	9/23/2008
General Planning Handbook for California State Parks	Final	Yes	California State Parks' guidelines for general plan development, which requires an inventory of known natural resources and general guidelines to comply with federal and state laws. State Park entities with specific management goals pertinent to Chapters 7 and 8 of this RAMNA are listed below.	http://www.parks.ca.gov/pages/21299/files/planning_handbook_april_2010.pdf	4/1/2010
Anza Borrego Desert State Park General Plan	Final	Yes	Management plan for Anza Borrego State Park. Although the majority of the park occurs outside the GAI, a small piece at Rattlesnake Valley occurs inside the GAI.	https://www.parks.ca.gov/?page_id=21299	2/11/2005
Cuyamaca Rancho State Park Final General Plan and Environmental Impact Report	Final	Yes	Management plan for the park. Goals include expanding protection of the Cuyamaca Natural Preserve to 1,030.5 acres and restoring the former Los Caballos Equestrian Campground area.	https://www.parks.ca.gov/?page_id=21299	2/1/2015
San Diego State Park System General Plan Torrey Pines State Beach and State Reserve	Final	Yes	Management plan for the park. Includes a goal to restore tidal influence at the Los Peñasquitos Marsh Natural Preserve.	https://www.parks.ca.gov/?page_id=21299	7/1/1984

Title	Status	Spatial Data	Reference Purpose	Link	Date
Tijuana River Comprehensive Management Plan National Estuarine Research Reserve Comprehensive Management Plan	Final	Yes	Management Plan for Border Field State Park and the FWS-administered Tijuana River National Wildlife Refuge. This plan includes the following objectives: ▪ Increase the existing prism to 775-930 acre-feet by expanding the area of subtidal channel, intertidal salt marsh, and marsh plain in the southern end of the estuary; ▪ Restore habitats in the corridor of the Tijuana River; and ▪ Continue the Friendship Marsh restoration program to fulfill its 250-acre total. Although a 6.5-acre piece of Border Field State Park occurs in the GAI, it is separated from the rest of the GAI by the Tijuana River Valley, there are no forecast projects in the vicinity of the Park, no aquatic features at this portion of the Park, and minimal mitigation opportunities. As such, it is not included in Chapter 8.	https://trnerr.org/management-plan/	9/1/2010
FWS Land Management Plans	See below	See below	See below	See below	See below
San Diego Bay National Wildlife Refuge Sweetwater Marsh and South San Diego Bay Units Comprehensive Conservation Plan and Environmental Impact Statement	Final	Yes	Management plan for the refuge. Includes the following objectives; however, the majority of this refuge is outside of the GAI: ▪ Restore 20 acres of intertidal wetlands, emphasizing restoration of native cordgrass dominated salt marsh habitat in the Sweetwater Marsh Unit; ▪ Restore tidal influence to 650 acres of salt ponds in the South San Diego Bay Unit; and ▪ Restore 65 to 90 acres of intertidal wetlands in the Otay River floodplain.	https://www.fws.gov/story/san-diego-bay-nwr-comprehensive-conservation-plan	8/1/2006
San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment	Draft	Yes	Management plan for the refuge. Includes the following objectives: ▪ Actively manage riparian vegetation along a 4-mile portion of the Sweetwater River; ▪ Maintain and enhance at least 60 vernal pools in 30 acres of the Otay-Sweetwater Unit; ▪ Conserve 12.5 acres of vernal pool habitat in the Del Mar Mesa Vernal Pool Unit; and ▪ Remove at least 90 percent of all woody invasive species from cottonwood-willow riparian forests and oak riparian forests in the refuge.	https://www.fws.gov/story/san-diego-bay-nwr-comprehensive-conservation-plan	6/1/2014
Tijuana River Comprehensive Management Plan National Estuarine Research Reserve Comprehensive Management Plan	Final	Yes	Management Plan for Border Field State Park and the FWS-administered Tijuana River National Wildlife Refuge. This plan includes the following objectives: ▪ Increase the existing prism to 775 to 930 acre-feet by expanding the area of subtidal channel, intertidal salt marsh, and marsh plain in the southern end of the estuary; ▪ Restore habitats in the corridor of the Tijuana River; and ▪ Continue the Friendship Marsh restoration program to fulfill its 250-acre total.	https://trnerr.org/management-plan/	9/1/2010
U.S. Military Land Management Plans	See below	See below	See below	See below	See below
Marine Corps Air Station Integrated Natural Resources Management Plan	Final	Yes	Management plan for the base. Includes a goal to eradicate tamarisk and giant reed from the base.	https://www.miramar-ems.marines.mil/Divisions/Natural-Resources-Division/Natural-Resources/	6/1/2018
Naval Base Coronado Integrated Natural Resources Management Plan	Final	Yes	Management plan for U.S. Navy facilities on Coronado, the Silver Strand, and Imperial Beach. Includes a goal to continue invasive species removal and restoration at Imperial Beach.	https://www.cnic.navy.mil/regions/cnrsw/om/environmental_support/environmental_core_support.html	7/1/2013
Naval Base San Diego Integrated Natural Resources Management Plan	Final	Yes	Management plan for the base. Includes a goal to conduct invasive species control in areas inhabited by the riparian bird least Bell's vireo at the Mission Gorge Recreational Facility.	https://www.cnic.navy.mil/regions/cnrsw/om/environmental_support/environmental_core_support.html	6/1/2014
San Diego Bay Integrated Natural Resources Management Plan	Final	Yes	Management plan for U.S. Navy facilities along San Diego Bay. Includes highlighted management goals to restore the mouth of Chollas Creek and the Lower Sweetwater River Flood Control Channel, which were also identified in a 2001 version of this document.	https://www.cnic.navy.mil/regions/cnrsw/om/environmental_support/environmental_core_support.html	9/1/2013

Title	Status	Spatial Data	Reference Purpose	Link	Date
Naval Base Point Loma Integrated Natural Resources Management Plan	Final	Yes	Management plan for the base. Includes a goal to eradicate tamarisk from the base.	https://www.cnic.navy.mil/regions/cnrsw/om/environmental_support/environmental_core_support.html	11/1/2012
Native American Tribal Land Management Plans	See below	See below	See below	See below	See below
Not applicable	Not applicable	Not applicable	Nine reservations occur in the GAI; however, they do not have publicly available land management plans.	Not applicable	Not applicable
USFS Land Management Plans	See below	See below	See below	See below	See below
Cleveland National Forest Land Management Plan	Final	Yes	USFS management plan for the Cleveland National Forest.	https://www.fs.usda.gov/main/cleveland/landmanagement/planning	9/1/2005
Design Criteria for the Southern California National Forests	Final	Yes	Provides an overall strategy for land management in Cleveland National Forest. Includes goals to control riparian weed species such as giant reed and tamarisk in forest lands and, in particular, control tamarisk in Santa Ysabel Creek.	https://www.fs.usda.gov/main/sbnf/landmanagement/planning	9/1/2005
BLM Land Management Plans	See below	See below	See below	See below	See below
California Coastal National Monument Resource Management Plan	Final	Yes	BLM management plan for California Coastal National Monument.	http://www.npshistory.com/publications/blm/california-coastal/rmp-2005.pdf	9/1/2005
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
South Coast Resource Management Plan	Not publicly available	Not applicable	BLM management plan that covers the Otay Mountain Wilderness area.	Not applicable	Not applicable
NPS Land Management Plans	See below	See below	See below	See below	See below
Nationwide Rivers Inventory	Final	No	Listing of Nationwide River Inventory river segments that are potential candidates for inclusion in the National Wild and Scenic River System. No listed national river segments are in or near the GAI.	https://www.nps.gov/subjects/rivers/nationwide-rivers-inventory.htm	9/10/2021
General Management Plan Cabrillo National Monument San Diego, California	Final	No	Management plan for the National Monument. Available as a physical copy only at park headquarters and local libraries.	https://www.govinfo.gov/content/pkg/FR-1996-04-12/pdf/96-9138.pdf	4/12/1996
Local Government Land Management Plans	See below	See below	See below	See below	See below
Natural Resource Management Plan for Mission Trails Regional Park	Final	Yes	City of San Diego's management plan for Mission Trails Regional Park. Includes a goal to eradicate giant reed, tamarisk, pampas grass, and perennial pepperweed from riparian systems in the park.	https://mtrp.org/master-plan/	2/8/2019
I-5 North Coast Corridor Public Works Plan/Transportation and Resource Enhancement Program	Final	Yes	Program developed by Caltrans District 11 and SANDAG in collaboration with the CCC, local cities, resource agencies, and the public. It details implementation of a 40-year program of rail and highway infrastructure improvements; enhanced and newly established bicycle and pedestrian coastal access routes; and preserved, restored, and enhanced sensitive coastal habitat through significant water quality, lagoon, and natural habitat improvements through the Resource Enhancement and Mitigation Program along 30 miles of northern San Diego County coastline.	https://dot.ca.gov/caltrans-near-me/district-11/programs/district-11-environmental/i-5pwp-toc	12/7/2016 (last amended)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Ramona Grasslands Preserve Resource Management Plan	Final	Yes	San Diego County's management plan for the Ramona Grasslands Preserve. Includes a goal to target weed eradication of several riparian species, including giant reed, tamarisk, and perennial pepperweed and a goal to eliminate weeds from Santa Maria Creek.	https://www.sandiegocounty.gov/content/sdc/parks/management_plans.html	2/1/2013
Resource Management Plan for Lusardi Creek Preserve	Final	Yes	San Diego County's management plan for the Ramona Grasslands Preserve. Includes a goal to eradicate giant reed.	https://www.sandiegocounty.gov/content/sdc/parks/management_plans.html	6/1/2009
San Diego Municipal Code Land Development Code Biology Guidelines	Updated periodically	No	Guidelines and requirements set forth by the City of San Diego for development. Includes preset mitigation ratios based on habitat type, location in the coastal zone, and location in a preserve. The mitigation ratios range from 0:1 to 8:1.	https://www.sandiego.gov/planning/programs/landdevcode/landdevmanual	2/1/2018 (last amended)
TransNet Environmental Mitigation Program	Final	Yes	SANDAG mitigation program for transportation projects in San Diego County. This includes a memorandum of agreement between SANDAG, Caltrans, CDFW, and FWS.	https://www.keepsandiegomoving.com/EMP-Group/EMP-docs.aspx	3/19/2008 (date of memorandum of agreement)
Water Resources Plans and Documents	See below	See below	See below	See below	See below
Carlsbad Watershed Management Area Water Quality Improvement Plan	Final	Yes	Plan developed by several local governments for water quality improvement in the watershed. Includes water quality improvement goals in line with the RWQCB's basin plan.	http://www.projectcleanwater.org/download/carlsbad-water-quality-improvement-plan-and-appendices-june-2016/	6/29/2016
Los Peñasquitos Water Quality Improvement Plan and Comprehensive Load Reduction Plan	Draft	Yes	Plan developed by several local governments for water quality improvement in the watershed. Includes water quality improvement goals in line with the RWQCB's basin plan. The plan includes a goal to restore Los Peñasquitos Creek.	http://www.projectcleanwater.org/download/san-dieguito-sdr-water-quality-improvement-plan-wqip/	9/25/2015
Mission Bay Watershed Management Area Water Quality Improvement Plan	Final	Yes	Plan developed by several local governments for water quality improvement in the watershed. Includes water quality improvement goals in line with the RWQCB's basin plan.	http://www.projectcleanwater.org/watersheds/mission-bay-la-jolla-wma/#plan	2/16/2016
Otay River Watershed Management Plan	Final	Yes	Plan developed by several local governments for watershed management, enhancement, and restoration in the Otay River and immediate watershed.	https://www.sandiegocounty.gov/dplu/docs/05-06FinalDraft_OtayRiverWMP.pdf	5/1/2006
San Diego River Water Quality Improvement Plan	Final	Yes	Plan developed by several local governments for water quality improvement in the watershed. Includes water quality improvement goals in line with the RWQCB's basin plan.	http://www.projectcleanwater.org/download/san-diego-river-sdr-water-quality-improvement-plan-wqip/	1/1/2016
San Dieguito River Watershed Management Area Water Quality Improvement Plan	Draft	Yes	Plan developed by several local governments for water quality improvement in the watershed. Includes water quality improvement goals in line with the RWQCB's basin plan.	https://www.waterboards.ca.gov/sandiego/water_issues/programs/stormwater/wqip.html	3/1/2015
County General Plans	See below	See below	See below	See below	See below
County of San Diego General Plan	Final	Yes	General plan for San Diego County. Includes a land use designation of open space-conservation.	https://www.sandiegocounty.gov/pds/generalplan.html	8/1/2011
City General Plans	See below	See below	See below	See below	See below
City of San Diego General Plan	Final	Yes	General plan for San Diego. Includes a land use designation of park, open space, and recreation.	https://www.sandiego.gov/planning/genplan/	3/10/2008
City of Imperial Beach General Plan	Updated periodically	Yes	General plan for Imperial Beach. Includes a development buffer of 100 feet from wetlands unless CDFW approves a reduced buffer. Includes an open space land use designation.	https://www.imperialbeachca.gov/planning	4/1/2015 (last updated)
City of National City General Plan	Updated periodically	Yes	General plan for National City. Includes an open space land use designation.	https://www.nationalcityca.gov/government/community-development/planning	1/24/2012 (last updated)

Title	Status	Spatial Data	Reference Purpose	Link	Date
City of Coronado General Plan	Updated periodically	Yes	General plan for Coronado. Includes an open space land use designation.	https://www.coronado.ca.us/269/Planning-Zoning	6/10/2004 (last updated)
City of Escondido General Plan	Updated periodically	Yes	General plan for Escondido. Requires a minimum 50-foot buffer from riparian systems. Includes a public land/open space land use designation.	https://www.escondido.org/general-plan.aspx	5/1/2012 (last amended)
City of Poway General Plan	Updated periodically	Yes	General plan for Poway. Includes an open space land use designation.	https://poway.org/286/General-Plan	5/21/2013 (last amended)
City of El Cajon General Plan	Updated periodically	Yes	General plan for El Cajon. Includes an open space land use designation.	https://www.cityofelcajon.us/your-government/departments/community-development/planning-division/adopted-planning-code-information	11/15/2013 (last updated)
City of Solana Beach General Plan	Updated periodically	Yes	General plan for Solana Beach. Includes an open space land use designation.	https://www.codepublishing.com/CA/SolanaBeach/#!/SolanaBeachGP/SolanaBeachGPNT.html	11/19/2014 (last updated)
City of Chula Vista General Plan	Updated periodically	Yes	General plan for Chula Vista. Includes a goal to enhance and restore the Sweetwater River. Includes an open space land use designation.	https://www.chulavistaca.gov/departments/development-services/planning/planning-digital-library/general-plan	12/5/2017 (last amended)
City of Santee General Plan	Final	Yes	General plan for Santee. Includes a park/open space land use designation.	https://www.cityofsanteeca.gov/services/development-services/planning-and-zoning-services/general-plan	8/27/2003
City of Lemon Grove General Plan	In progress	No	The general plan for Lemon Grove is currently being updated. The previous version of the plan is not publicly available. The current zoning map does not include an open space or conservation land use designation.	https://www.lemongrove.ca.gov/city-hall/development-services/planning-zoning/general-plan-update	Not applicable
City of Del Mar General Plan	Final	Yes	The City of Del Mar operates planning by its zoning map, which does include an open space overlay but not in a manner that precludes development.	http://www.delmar.ca.us/168/Maps-Zoning	11/1/2001
City of La Mesa 2012 Centennial General Plan	Final	Yes	General plan for La Mesa. Includes land use designations of open space and regional park.	http://www.cityoflamesa.com/953/General-Plan	7/9/2013
Other Conservation and Management Documents	See below	See below	See below	See below	See below
California Coastkeeper Alliance – Ocean Climate Resiliency Action Plan	Final	No	California coastkeeper's plan addressing climate change and rising sea levels. Plan includes preventing ocean wastewater discharges from causing ocean acidification and hypoxia hotspots, preventing agricultural nutrient inputs from causing harmful algal blooms and exacerbating ocean acidification and hypoxia hot spots, improving water quality in Marine Protected Areas, sequestering greenhouse gas emissions, and preventing coastal development in zones at risk from sea-level rise.	https://cacoastkeeper.org/wp-content/uploads/2019/11/CCKA_Ocean-Climate-Resiliency-Campaign_FINAL.pdf	11/19/2019
California EcoAtlas	Updated periodically (nearly daily)	Yes	Statewide database tracking the extent and condition of wetlands in California, managed by the San Francisco Estuary Institute.	https://www.ecoatlas.org/	Updated nearly daily
Coastal Conservancy Strategic Plan 2018–2022	Final	No	Implemented by the Coastal Conservancy. Includes a discussion of issues and conservancy funded efforts in the GAI, including wetland and riparian habitat restoration.	https://scc.ca.gov/about/plan/	11/30/2017

Title	Status	Spatial Data	Reference Purpose	Link	Date
Conserving California's Coastal Habitats – A Legacy and A Future with Sea Level Rise	Final	Yes	Statewide coastal conservation plan by the Coastal Conservancy and The Nature Conservancy. Contains plans to maintain and manage coastal lands to be resilient to sea-level rise. Plans include maintaining existing resilient conservation lands, conserving resilient landscapes, managing in place for resilience, conserving potential future habitat areas, and increasing adaptive capacity.	https://coastalresilience.org/project/conservation-assessment/	2018
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 in tracking wetland conditions statewide.	https://www.sccwrp.org/publications/	4/1/2015
Rising to the Urgent Challenge: Strategic Plan for Responding to Accelerating Climate Change	Updated periodically	No	Addresses adaptation, mitigation, and engagement strategies to achieve goals and objectives of minimizing the impact of climate change on fish and wildlife by applying science in managing species and habitats; reducing levels of greenhouse gases; and collaborating with other organizations to determine solutions to challenges and threats to fish and wildlife conservation posed by climate change.	https://climatechange.lta.org/usfws-strategic-plan/#:~:text=The%20primary%20purposes%20of%20Rising,the%20continuing%20benefit%20of%20the	2010
U.S. Pacific Coastal Wetland Resilience and Vulnerability to Sea-Level Rise	Final	No	An original research article describing and comparing climate models and scenarios with respect to coastal wetland resilience and sea-level rise.	https://advances.sciencemag.org/content/4/2/eaao3270	2/21/2018
Wetlands on the Edge. The Future of Southern California's Wetlands	Final	Yes	Regional strategy document from the Southern California Wetland Recovery Project. Includes goals to restore 7,700 acres of tidal wetlands, expand upland buffers to at least 40 percent of existing wetland perimeters and up to 1,600 feet from the wetland edge, restore 50,000 acres of non-tidal wetlands, and restore or maintain 189,400 acres of streams and associated adjacent habitats.	https://scwrp.databasin.org/pages/regional-strategy-report	2018

[a] Consistent with the Caltrans SAMNA and Chapter 4, 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; or state species of special concern.

4. EXISTING MITIGATION OPPORTUNITIES

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

4.1 Other Advance Mitigation Initiatives

Two other transportation project-related advance mitigation initiatives may apply to the GAI.

4.1.1. SANDAG Environmental Mitigation Program

Through the Environmental Mitigation Program ("EMP"), SANDAG protects, preserves, and restores native habitats to offset the disturbance caused by regional and local transportation projects. The EMP is funded by TransNet, a regional transportation-designated half-cent sales tax administered by SANDAG. These funds can be used on TransNet-eligible SHOPP and STIP-eligible projects as identified in the *2050 Regional Transportation Plan* (SANDAG 2011) and are tied to mitigation requirements. The EMP program allows SANDAG to purchase land in advance of transportation project impacts; it also informs transportation project mitigation planning. SANDAG coordinates with local, state, and federal agencies and nonprofit groups through the Regional Habitat Conservation Taskforce (formerly "EMP Working Group") to acquire, manage, and monitor land.

4.1.2. SHOPP Advance Mitigation Credits

The 2016 SHOPP, with California Transportation Commission approval, released the first funds used to program Caltrans advance mitigation projects in several Caltrans Districts. The projects were programmed against the $40 million reserve created in the 2016 SHOPP for advance mitigation project delivery. Thirteen pilot advance mitigation projects were programmed in the SHOPP and their delivery is underway. However, none are located in District 11.

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. FWS and/or CDFW estimate adverse effects associated with the covered activities and issue incidental take permits. Once the HCP, NCCP, or HCP/NCCP is adopted and the incidental take permit(s) are issued, signatories and participating special entities, where applicable, can request take authorization for project-related effects on covered species.

[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 Fish and Game Code

Participation in an adopted HCP, NCCP, or HCP/NCCP streamlines permit processes by eliminating the need to obtain project-specific incidental take permits from FWS and/or CDFW and by providing 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 the following active and/or pending HCPs and NCCPs in the GAI that apply to transportation-related activities and that Caltrans may be able to use to meet its compensatory mitigation needs in the GAI:

- San Diego Multiple Species Conservation Program (San Diego County 1998)

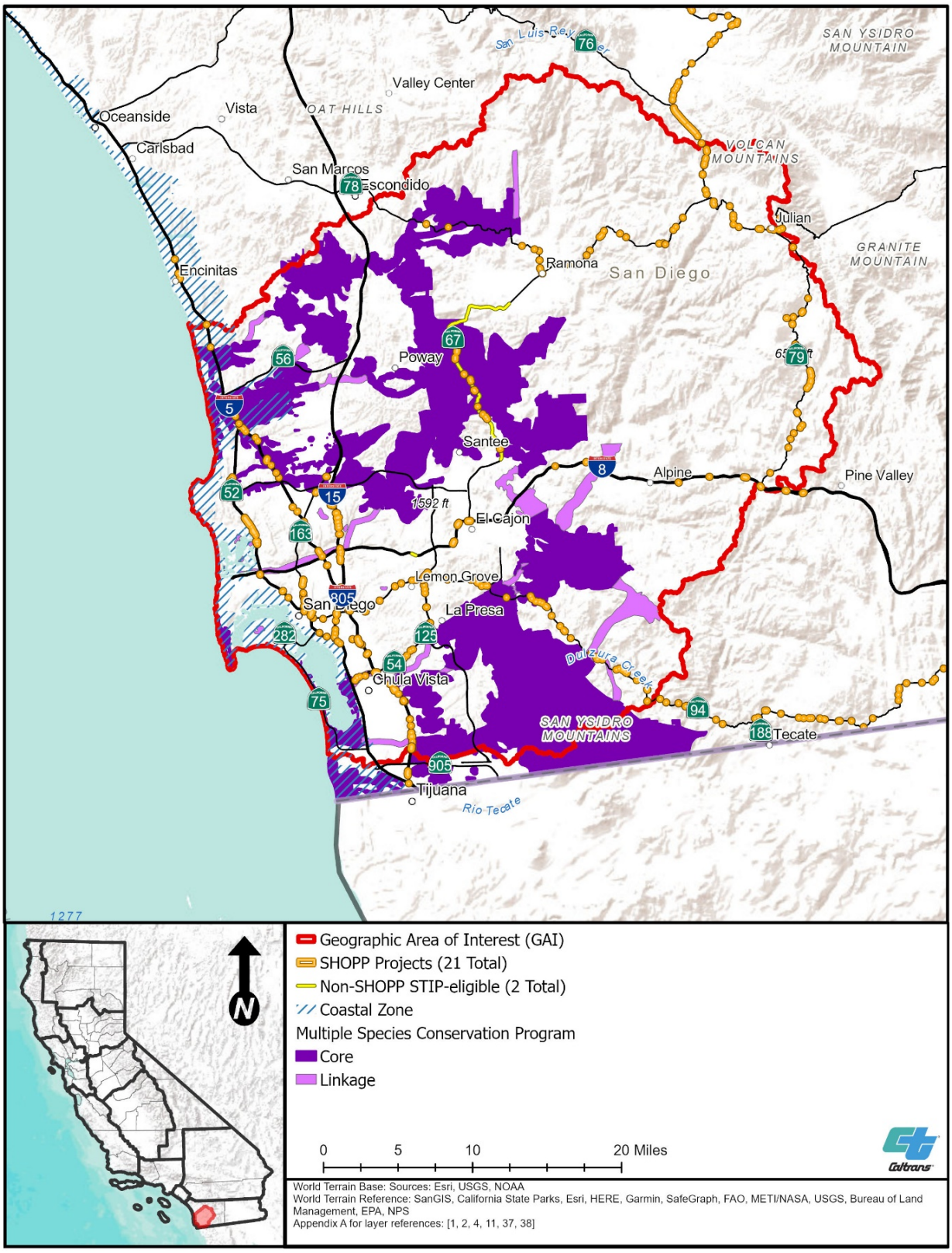
Figure 4-1 depicts the location of the San Diego Multiple Species Conservation Program. Table 4-1 summarizes the signatories, status and date of the plan, plan area, participating transportation agencies, covered species, and covered natural communities. Multiple other project-specific HCPs in the GAI were not included in Table 4-1 because they were determined to not be a viable mitigation option for Caltrans. For example, they applied to a non-Caltrans single user, or covered activities that were not road infrastructure-related and could not be adapted to road infrastructure. In addition, when Caltrans and/or RTPAs are not signatories or participating special entities in any of the HCPs or NCCPs listed in Table 4-1, their participation and coverage under any HCP or NCCP is at the discretion of the implementing entity/plan manager.

Table 4-1. Overview of HCPs and NCCPs in the GAI[a,b]

Name	Signatories[c]	Date	Area (acres)	Participating Transportation Agencies	Covered Species	Covered Natural Communities
San Diego Multiple Species Conservation Program	**FWS, CDFW**	1998	582,243	SANDAG	Coastal California gnatcatcher (*Polioptila californica californica*), southwestern willow flycatcher (*Empidonax traillii extimus*), plus 37 other wildlife and 46 plant species	26 natural communities discussed in plan

[a] Up-to-date information on HCPs and NCCPs can be found at the following websites:
https://ecos.fws.gov/ecp/report/conservation-plans-region-summary?region=8&type=HCP
https://wildlife.ca.gov/conservation/planning/nccp
[b] This table lists HCPs and NCCPs that may be applied to Caltrans' mitigation needs.
[c] Signatories in **bold** are signatories to the *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation* (Caltrans et al. 2020).

Figure 4-1. HCPs and NCCPs



4.3 Conservation and Mitigation Banks

A conservation or mitigation bank is privately or publicly owned land managed for its natural resource values 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 its 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 19 active or pending conservation and/or mitigation banks with service areas that overlap all or part of the GAI. Information on the agency approvals and the types of credits available—and brief descriptions of each bank with species of mitigation need, water, and non-wetland water credits—are provided in Table 4-2, and the location and extent of their service areas are depicted on Figures 4-2 through 4-7. As noted in Table 4-2, one conservation bank and one mitigation bank do not have spatial data that are publicly available in an electronic format.

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. Table 4-2 is a summary of the conservation and mitigation banks available at the time of the writing of this RAMNA. Additional banks may become available in the future.

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

Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Credit Types
Buena Creek Gnatcatcher Conservation Bank	2012	Active – credits available	**FWS**	121.49	Coastal California gnatcatcher, Coastal sage scrub
Cleveland Corridor Conservation Bank	Not known	Active credits available	**CDFW**	600	Tier I – Coast live oak woodland, southern coast riparian forest, open Engelmann oak woodland, dense Engelmann oak woodland, sycamore oak riparian woodland, sycamore alluvial woodland Tier II – Diegan coastal scrub, coastal sage-chaparral transition Tier III – Nonnative grassland, chamise chaparral, ceanothus chaparral
Cornerstone Lands Conservation Bank	1997	Active – credits available	**FWS**, **CDFW**	2,600	Coastal sage scrub/nonnative grassland
Crestridge Conservation Bank	1995	Active – credits available	**FWS, CDFW**	2,377	Tier I – Native grassland, oak woodland, and wetlands (including vernal pools, alkali marsh, freshwater marsh, riparian forests, riparian woodlands, and maritime succulent scrub) Tier III – Chaparral (except for southern maritime chaparral and mafic chamise and mafic southern mixed chaparral), nonnative grassland, and other grassland
Daley Ranch Conservation Bank	1997	Active – credits available	**FWS, CDFW**	2,842	Chaparral and coastal sage scrub, coast live oak woodland, Englemann oak woodland
Manchester Avenue Conservation Bank	2014	Active – credits available	**FWS, CDFW**	123	Coastal sage scrub, southern maritime chaparral
Miller Valley Ranch Mitigation Bank	2019	Active – credits available	**Corps, CDFW**	23.43	Wetlands and chaparral

Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Credit Types
North County Habitat Bank	2007	Active – only coastal sage scrub credits available	**Corps, FWS, CDFW**	18.73	Wetland/riparian, coastal sage scrub
Otay River Mitigation Bank	Pending	Pending	**Corps** is anticipated	135	Proposed: WOTUS
Port of San Diego South San Diego Bay Pond 20 Wetland Mitigation Bank[c]	Pending	Pending	**Corps, EPA, FWS, NMFS, RWQCB, CCC** are anticipated	95	Proposed: wetlands
Ramona Grasslands Conservation Bank	2014	Active – credits available	**FWS, CDFW**	210.43	Nonnative grassland, vernal pool, burrowing owl
Rancho Jamul Wetlands Mitigation Bank Phase IIB	2000	Pending	**Corps, EPA, CDFW, RWQCB** are anticipated	46 (planned for Phase II)	Phase I is sold out. Phase II is anticipated to have credits for wetlands/WOTUS, waters of the State, and riparian.
Red Mountain Conservation Bank	2011	Active – credits available	**FWS**	557.36	Diegan coastal sage scrub (gnatcatcher-occupied), open coast live oak woodland, mafic southern mixed chaparral and mafic chamise, chaparral, native grassland, southern coast live oak riparian forest, riparian scrub, emergent wetland, coastal/valley freshwater marsh
San Luis Rey Mitigation Bank	2014	Active – credits available	**Corps, CDFW**	56.5	Wetlands and non-wetland WOTUS/waters of the State, State jurisdictional/non-waters, and grassland buffer
San Miguel Conservation Bank	1997	Active – credits available	**FWS, CDFW**	1,852	Coastal sage scrub, southern mixed/chamise chaparral, native (perennial) grassland, seasonal stock pond, dry marsh/riparian scrub; San Diego barrel cactus, coastal scrub-chaparral, chamise chaparral, nonnative grassland

Name	Year Approved	Current Status	Signatories[b]	Area (acres)	Credit Types
San Vicente Conservation Bank	1996	**Inactive**	**CDFW**	320	Tier III – chaparral, nonnative grassland (coastal sage scrub is sold out)
Singing Hills Conservation Bank[c]	1998	**Unknown**	**FWS**	79	Coastal sage scrub/nonnative grassland Single-client bank for San Diego County projects, other projects may be approved on a case-by-case basis.
Willow Road Conservation Bank	2018	Active – credits available	**CDFW**	70.1	Tier II – Diegan coastal sage scrub (California gnatcatcher-occupied), coastal sage-chaparral scrub Tier III – chamise chaparral, nonnative grassland

[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::::::
[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] Service area not publicly available

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

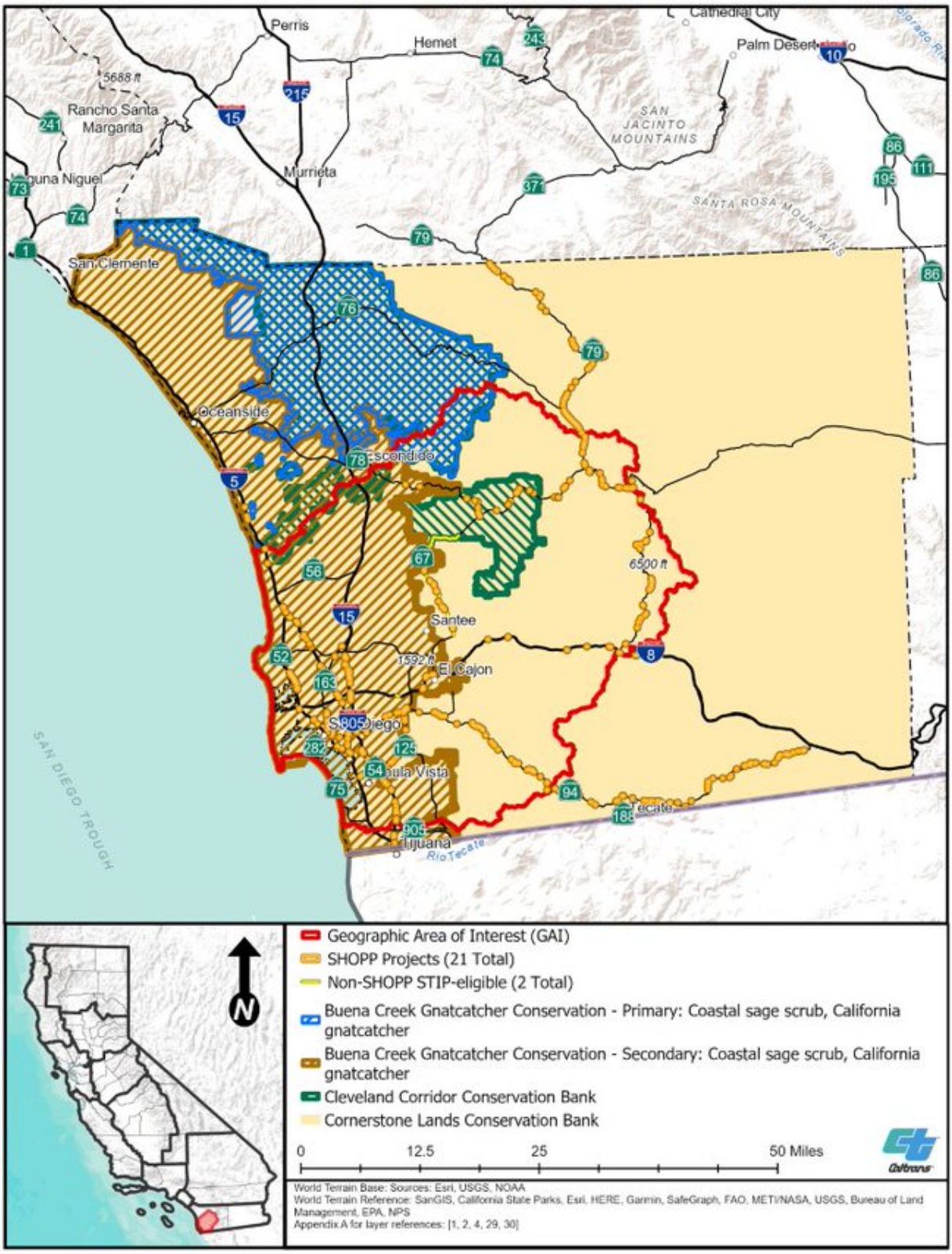


Figure 4-3. Conservation and Mitigation Bank Service Areas – Part 2

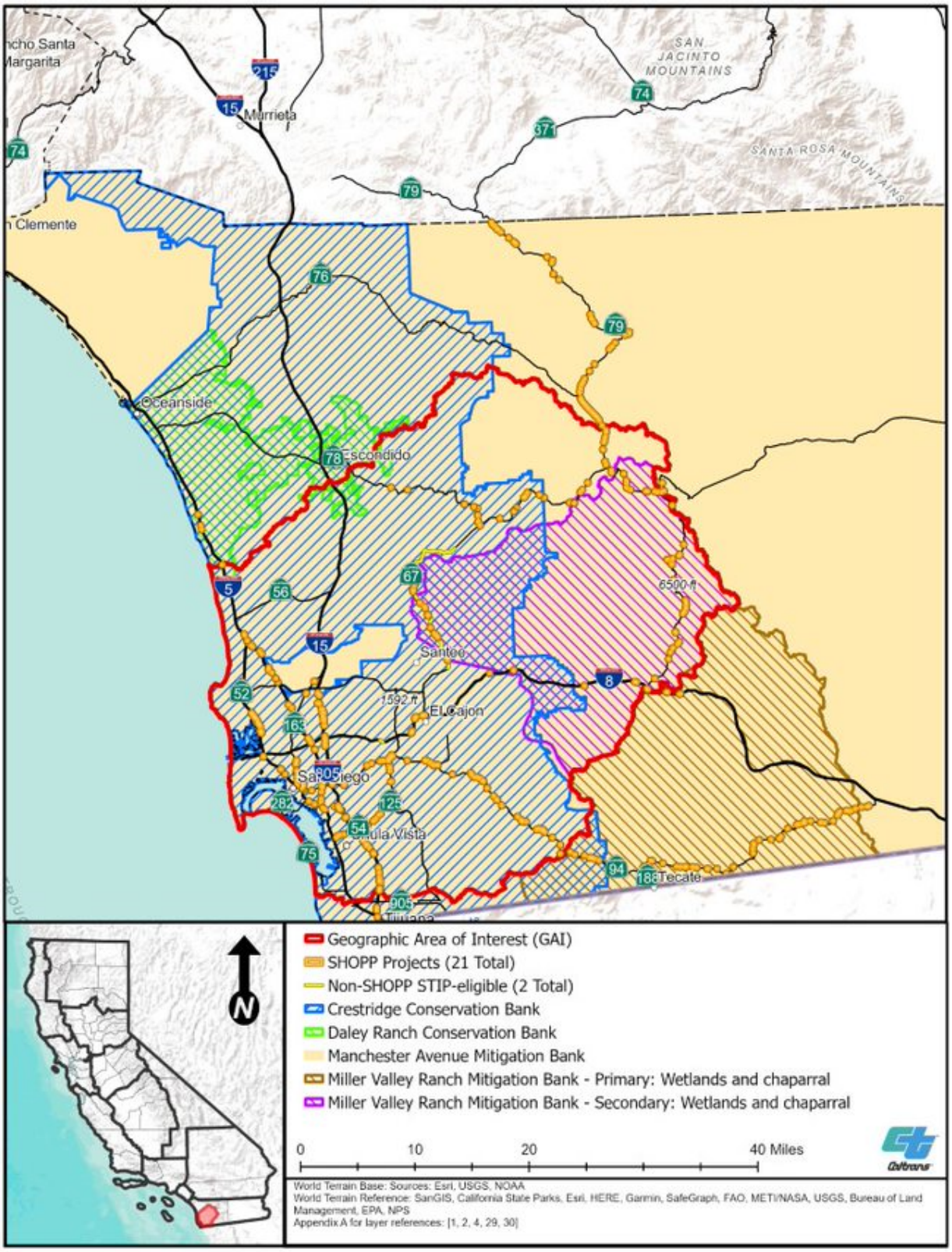


Figure 4-4. Conservation and Mitigation Bank Service Areas – Part 3

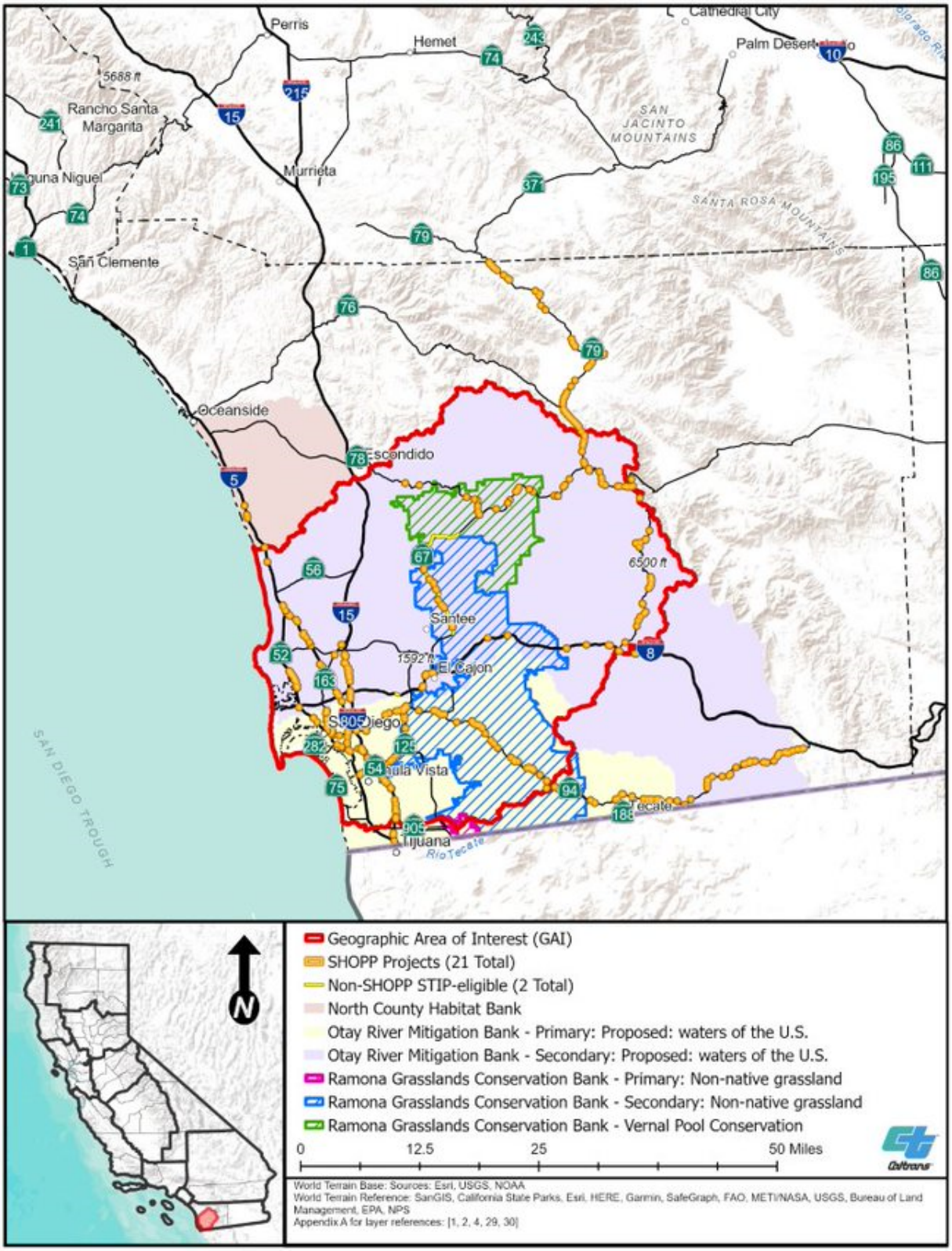


Figure 4-5. Conservation and Mitigation Bank Service Areas – Part 4

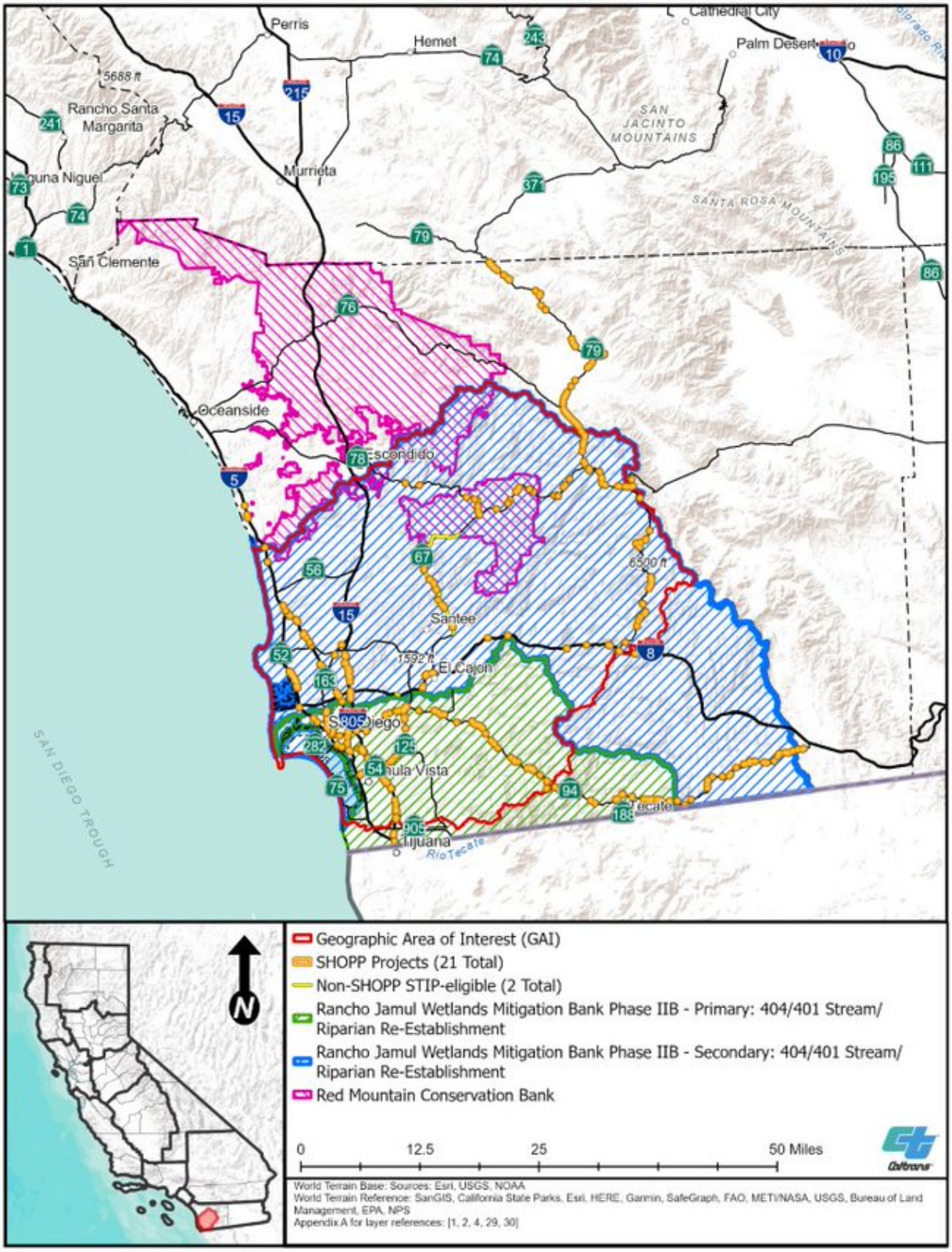


Figure 4-6. Conservation and Mitigation Bank Service Areas – Part 5

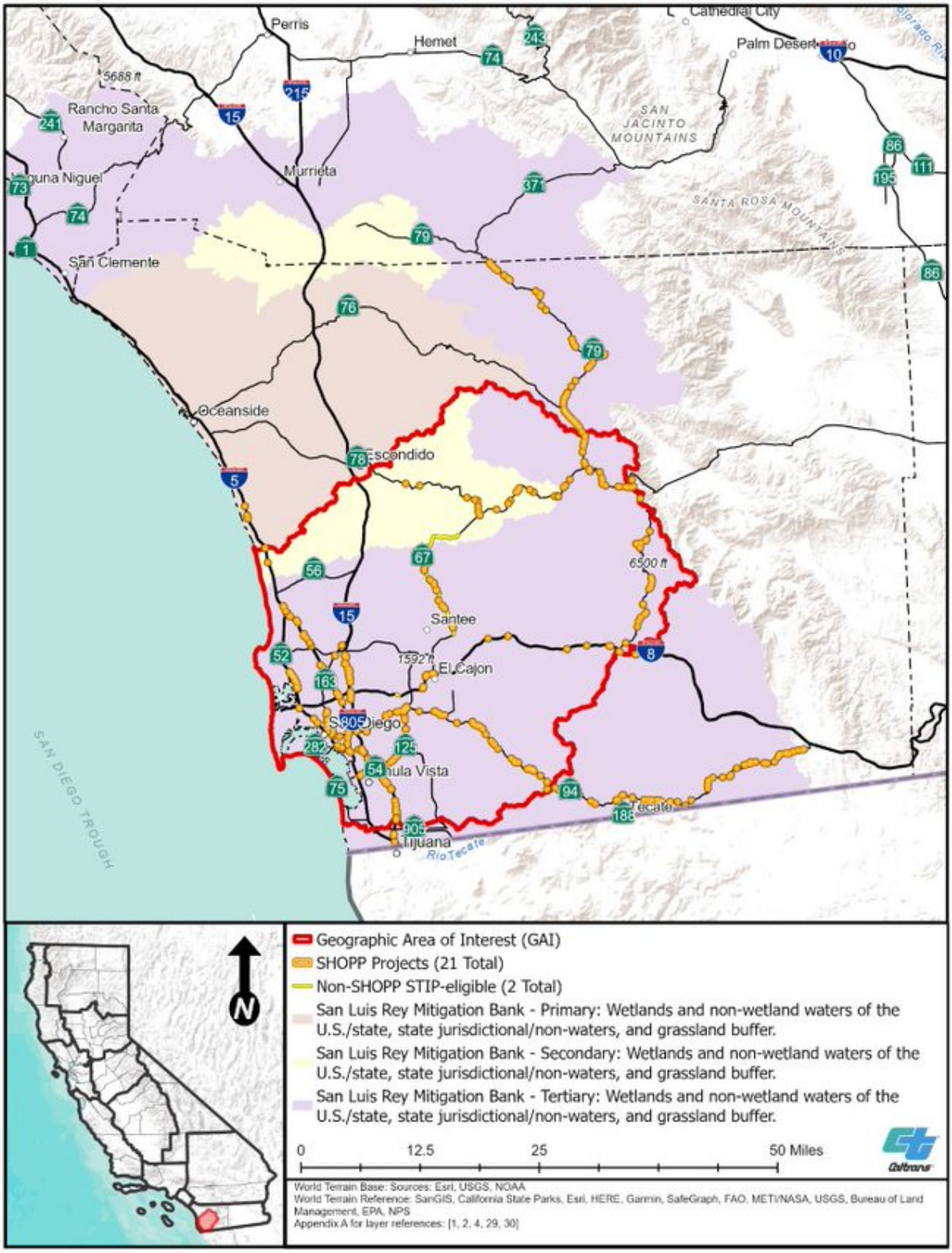
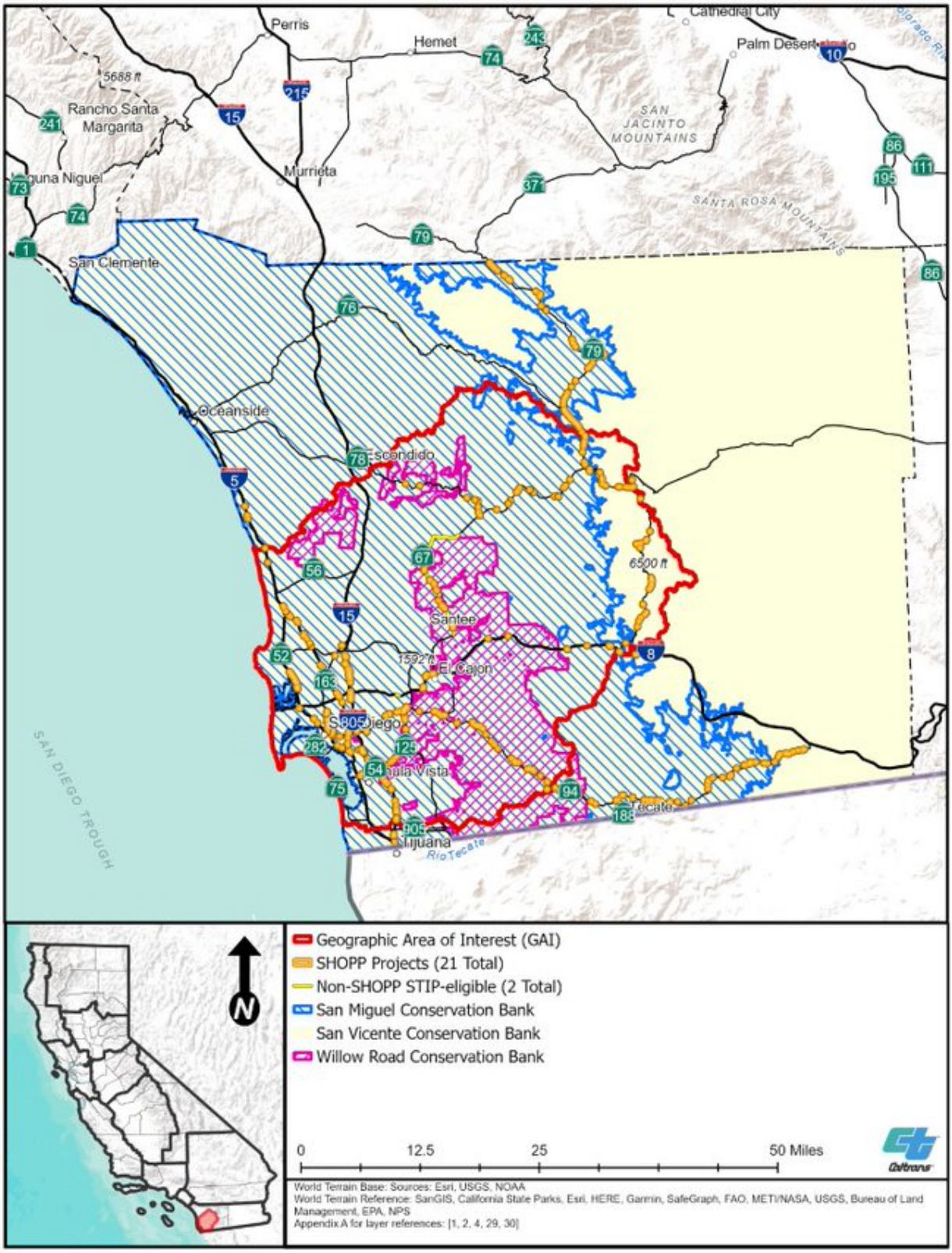


Figure 4-7. Conservation and Mitigation Bank Service Areas – Part 6



4.4 In-lieu Fee Programs

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

No in-lieu fee programs are currently established within the GAI (Corps 2021).

4.5 RCISs and MCAs

Assembly Bill 2087 established CDFW's RCIS Program in 2016 (Fish and Game Code 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 an RCIS is approved by CDFW and, with respect to the SHS, create credits that may be used as compensatory mitigation to offset impacts identified under CESA and the Lake and Streambed Alteration Program. An MCA has numerous required elements, many of which parallel the requirements of a mitigation bank. These required elements can be found in the California Fish and Game Code § 1856.

At this time, practical instructions and guidance for establishing MCAs are being developed by CDFW[3] and no MCAs or MCA credits are available. It is important to note that MCAs are not permits as are 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 2021).

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

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

4.6 Wildlife Crossing and Aquatic Corridor Enhancements

One potential benefit of the MCA process is that it, like conservation and mitigation banking, 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 and distinct from a specific transportation project. Connectivity information for the GAI is summarized in Section 2.11.

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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 the sections below, 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 aquatic resources, riparian habitat, species of mitigation need, and special-status species potentially co-occurring with the species of mitigation need.

Because Caltrans District 11 chose to focus the analysis on aquatic resources (Section 1.5.3), the results presented below are organized by the San Diego HUC-8 Subbasin within Caltrans District 11, which is also the GAI.

5.1 Approach

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

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

5.1.1. SHOPP Needs Assessment: SAMNA Model Results

SHOPP impacts were forecast through the SAMNA. The SAMNA consists of an intersection of assumed transportation project footprints with natural resource layers developed for the SAMNA. Briefly described in Section 1.4, more detailed SAMNA

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

To identify the list of SHOPP projects planned for the GAI, Caltrans consulted the SHOPP Ten-Year Book for fiscal years 2021/22 to 2030/31 (Caltrans 2021a). The intent of the SHOPP Ten-Year Book is to raise awareness of planned future transportation projects, and detailed transportation project information is not provided. The SHOPP Ten-Year Book includes 21 SHOPP transportation projects in the GAI that are currently in the planning and conceptual phases (Appendix B). The general locations of all 21 planned transportation projects are shown on most of the maps in this document.

SAMNA estimates are not precise and are not intended to be used for transportation project permitting; however, they are suitable for informing advance mitigation project scopes. The AMP developed the SAMNA strictly and specifically for Caltrans' use in advance mitigation planning—that is, when Caltrans is justifying, proposing, and scoping advance mitigation projects (Caltrans 2019a, 2021b). The SAMNA model, its foundation, and assumptions are described in the *Statewide Advance Mitigation Needs Assessment Report* (Caltrans 2023) and some of its uncertainties are highlighted in Appendix E, *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 aquatic resources can be found in Section 5.2 and forecast impacts on species of mitigation need 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 E, *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 Caltrans District, MPOs, RTPAs, and other public agencies that implement transportation improvements.

Obtaining a reliable list of STIP transportation projects within the 10-year planning horizon is problematic. It is never known which transportation projects will be funded through the STIP until the funds are voted on by the California Transportation Commission, at which point the transportation projects are well past their planning and conceptualization phases and entering their delivery phases. Because of this timing, funded STIP projects will likely need compensatory mitigation before the AMP can deliver the needed mitigation. AMP planning, therefore, must glean a list of transportation projects from the broader set of non-SHOPP transportation projects that may or may not receive STIP funding, such as STIP-eligible transportation projects. Additionally, the STIP is currently receiving very little funding in favor of the "fix-it-first" philosophy of the Road Repair and Accountability Act of 2017, although 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. From this evaluation, two planned STIP-eligible transportation projects were identified within the GAI for fiscal years 2021/2022 to 2030/2031 that could possibly benefit from AMA-funded advance mitigation projects. Caltrans currently refers to them as "Alvarado Creek" and "State Route 67 Widening."

Non-SHOPP STIP-eligible Potential Impacts

Impacts of the two planned STIP-eligible transportation projects within the GAI for fiscal years 2021/2022 to 2030/2031 were assessed qualitatively.

Alvarado Creek

This transportation project has not been scheduled; however, there is a high probability that it will be programmed within the RAMNA's planning period. Proposed for Interstate 8 between approximately Post Miles 10.6 and 10.9, the transportation project's conceptual description consists of repairing damage to a channel by enclosing the trapezoidal soft bottom system consistent with upstream and downstream sections of the channel. Based on professional judgment, there is a potential for the transportation project to have wetland impacts and compensatory mitigation needs.

State Route 67 Widening

The State Route 67 widening transportation project (EA 28700, PI:1100000339) is programmed, will have STIP funding, and will have alternatives with the potential to affect the San Diego River in the GAI. Given that this project is currently starting its environmental studies, it will likely need mitigation within the RAMNA's planning period: the environmental document is currently scheduled in or after the year 2025. Construction would likely not start before 2026 and would likely take multiple years. Located on State Route 67 between approximately Post Miles 5.40 and 21.40, the project's conceptual description consists of improving the safe and efficient movement of people in various modes of travel and of goods during both typical operations and during emergencies. Because some of the alternatives have the potential to affect the San Diego River, there is a potential for the transportation project to have wetland impacts, habitat impacts, and compensatory mitigation needs.

Caltrans District 11 will take into consideration this information when analyzing its compensatory mitigation needs. For example, STIP-eligible project needs could be added

[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.

to the quantitative forecast impacts on aquatic resources in Section 5.2 and quantitative forecast impacts on species of mitigation need in Section 5.3.

5.2 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 San Diego HUC-8 sub-basin that makes up the GAI. Aquatic resources impacts are categorized as potential impacts on threatened and endangered fish, wetlands, and non-wetland waters. Riparian habitat and coastal wetlands are also discussed. Refer to Appendix G, *Aquatic Resource Locations*, for maps depicting the location and extent of wetlands and non-wetland waters in the GAI. Riparian habitat is a land cover type mapped in Appendix D, *Land Cover Types*.

5.2.1. Estimated Impacts on Threatened and Endangered Fish Species

Threatened and/or endangered fish species that are known to occur or have the potential to occur in the GAI were excerpted from the SAMNA Reporting Tool's fish habitat layer, which was developed using the USGS National Hydrography Dataset and other information (Caltrans 2018, 2021g). Based on a search of the fish habitat layer, no threatened or endangered fish species were forecast to be affected by transportation projects in the GAI (Section 2.17.4; Caltrans 2021f).

5.2.2. Estimated Impacts on Wetlands

Using the methods described in Section 5.1.1, impacts on wetlands were estimated for the 21 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, 8 are forecast to affect 0.6 acre of wetland habitat in the GAI, including <0.1 acre of depressional seasonal natural forested habitat, <0.1 acre of depressional seasonal unnatural emergent habitat, <0.1 acre of freshwater emergent wetland, 0.6 acre of freshwater forested/shrub wetland, and <0.1 acre of freshwater pond (Table 5-1; Caltrans 2021b).

Note the SAMNA's terrestrial habitat layers include wetland types (for example, freshwater emergent wetland, saline emergent wetland, and wet meadow, as shown in Table 2-3). However, wetland forecasts based on the SAMNA's wetland layer are considered more accurate than wetland habitat forecasts based on the SAMNA's terrestrial habitat layers. Therefore, the wetland estimates below are based solely on the SAMNA's wetland data layer (Caltrans 2021b).

Table 5-1. Summary of Estimated SHOPP Impacts on Wetlands in the GAI (acres)

Sub-basin (HUC-8)	Sub-basin Number	Number of Trans-portation Projects[a]	Depressional Seasonal Natural Forested	Depressional Seasonal Unnatural Emergent	Freshwater Emergent Wetland	Freshwater Forested/Shrub Wetland	Freshwater Pond	Total[b]
San Diego	18070304	8	<0.1	<0.1	<0.1	0.6	<0.1	**0.6**

[a] Transportation projects are listed in Appendix B.
[b] Total may be different on account of rounding.

Estimated Impacts on Wetlands in the Coastal Zone

As pointed out in Section 2.17.2, Caltrans did not find any coastal wetland spatial data for the GAI. Further, no suitable species or other element from the SAMNA data layers was found to be a suitable proxy for coastal wetlands. Nevertheless, for the purposes of this RAMNA, it is assumed that wetland impacts forecast within the coastal zone would be evaluated under the CCC's coastal wetland impact standards. Hence, of the 21 SHOPP transportation projects evaluated, none are forecast to affect wetlands in the GAI's coastal zone.

As pointed out in Section 2.17.2, CCC would likely identify as present more coastal wetlands than are included in the SAMNA's wetland layer, which is based on the National Wetland Inventory. Consequently, transportation projects may affect CCC wetlands not included in the SAMNA's wetland layer.

5.2.3. Estimated Impacts on Non-wetland Waters

Using the methods described in Section 5.1.1, impacts on non-wetland waters were estimated for the 21 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, 14 are forecast to affect 2.5 acres of non-wetland waters in the GAI, including <0.1 acre of canal/ditch habitat and 2.5 acres of stream/river habitat (Table 5-2; Caltrans 2021b).

Table 5-2. Summary of Estimated SHOPP Impacts on Non-wetland Waters in the GAI (acres)

Sub-basin (HUC-8)	Sub-basin Number	Number of Transportation Projects[a]	Canal/Ditch	Stream/River	Total[b]
San Diego	18070304	14	<0.1	2.5	**2.5**

[a] Transportation projects are listed in Appendix B.
[b] Total may be different on account of rounding.

Estimated Impacts on Non-wetland Waters in the Coastal Zone

Of the 21 SHOPP transportation projects evaluated, none are forecast to affect non-wetland waters in the GAI that are located in the coastal zone and under the jurisdiction of the CCC.

5.2.4. 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 desert riparian, montane riparian, and valley foothill riparian forecast from the SAMNA's terrestrial layer. No impacts on desert riparian or montane riparian habitat were forecast. Adapting the methods described in Section 5.1.1, impacts on riparian habitat were estimated for the 21 transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, 5 SHOPP transportation projects are forecast to affect 0.6 acre of valley foothill riparian habitat in the GAI (Table 5-3; Caltrans 2021b).

Table 5-3. Summary of Estimated SHOPP Impacts on Riparian Habitat in the GAI (acres)

Sub-basin (HUC-8)	Sub-basin Number	Ecoregion Section(s)	Number of Transportation Projects[a]	Valley Foothill Riparian	Total
San Diego	18070304	Southern California Coast	3	0.5	**0.5**
San Diego	18070304	Southern California Mountains and Valleys	2	<0.1	**<0.1**
Not applicable	Not applicable	**Total**	**5**	**0.6**	**0.6**

[a] Transportation projects are listed in Appendix B.

Estimated Impacts on Riparian Habitat in the Coastal Zone

Of the 21 SHOPP transportation projects evaluated, none are forecast to affect riparian habitat in the GAI that is located in the coastal zone and under the jurisdiction of the CCC.

5.3 Estimated Wildlife Impacts

The quantitative impacts presented in this document are estimates, 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 11, as well as for species that may co-occur in their habitats. The complete results of the SAMNA, inclusive of the 21 transportation projects planned in the GAI and listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*, that may affect special-status plant and wildlife species, are provided in Appendix E, *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 (Caltrans 2021b). Based on a search of the species-attributed vegetation layer, 110 non-fish special-status terrestrial species have the potential to occur in the GAI (Section 2.8, Appendix E; Caltrans 2021b). Using the methods described in Section 5.1.1, the SAMNA analysis determined that 19 SHOPP transportation projects could potentially affect 16 habitat types, which could support up to 110 special-status species (Table 5-4).

Table 5-4. Summary of Estimated SHOPP Impacts on Special-status Species Habitat in the GAI

Ecoregion Section	Number of Caltrans SHOPP Projects[a]	Number of Habitats[b]	Number of Special-status Species[c, d]	Estimated Total Habitat Impact (acres)[b]
Southern California Coast	12	9	78	6.3
Southern California Mountains and Valleys	9	15	74	4.6
Total[e]	**19**	**16**	**110**	**10.9**

[a] Transportation projects are listed in Appendix B.
[b] Excludes urban.
[c] Special-status terrestrial plant and wildlife species evaluated through the SAMNA consisted of federal and state threatened, endangered, or sensitive species; state fully protected or rare species; or state species of special concern.
[d] Included in the SAMNA. See SAMNA Report (Caltrans 2023).
[e] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one ecoregion section. Some special-status species occur in more than one ecoregion section.

Species of mitigation need are species for whom a high probability of compensatory mitigation need is anticipated (Section 1.5). Each terrestrial species of mitigation need is discussed briefly in the subsections below: coastal California gnatcatcher (Section 5.3.1) and least Bell's vireo (Section 5.3.2).

5.3.1. Coastal California Gnatcatcher

This species was chosen as a species of mitigation need because of its status and the ongoing need for compensatory mitigation for transportation projects in the GAI. Coastal California gnatcatcher is a federally threatened bird species and a California species of special concern that occurs in coastal sage scrub habitats.

Using the methods described in Section 5.1.1, impacts on coastal California gnatcatcher were estimated for the transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, 15 are forecast to affect 7.5 acres of coastal California gnatcatcher habitat in the GAI (Table 5-5; Caltrans 2021b).

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

Ecoregion Section	Coastal California Gnatcatcher Habitat: Number of Caltrans SHOPP Projects[a]	Coastal California Gnatcatcher: Estimated Habitat Impact (acres)	Least Bell's Vireo Habitat: Number of Caltrans SHOPP Projects[a]	Least Bell's Vireo: Estimated Habitat Impact (acres)	Total
Southern California Coast	12	6.1	2	0.2	**6.1**
Southern California Mountains and Valleys	5	1.4	0	0.0	**1.4**
Total[b]	**15**	**7.5**	**2**	**0.2**	**7.5**

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

5.3.2. Least Bell's Vireo

This species was chosen as a species of mitigation need because of its status and the ongoing need for compensatory mitigation for transportation projects in the GAI. Least Bell's vireo is a federally and state endangered subspecies of bird that nests exclusively in riparian habitats.

Using the methods described in Section 5.1.1, impacts on least Bell's vireo were estimated for the transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, 2 are forecast to affect 0.2 acre of least Bell's vireo habitat in the GAI (Table 5-5; Caltrans 2021b).

5.3.3. Estimated Impacts on Terrestrial Species of Mitigation Need in the Coastal Zone

A portion of the GAI is located within the coastal zone that is under CCC's jurisdiction. SAMNA forecast results for the area within the coastal zone are presented below.

Coastal California Gnatcatcher

Using the methods described in Section 5.1.1, impacts on coastal California gnatcatcher were estimated for the transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, none are forecast to affect coastal California gnatcatcher habitat in the coastal zone that is under CCC's jurisdiction (Caltrans 2021b).

Least Bell's Vireo

Using the methods described in Section 5.1.1, impacts on least Bell's vireo were estimated for the transportation projects listed in Appendix B, *Transportation Projects Planned for the GAI during the Planning Period*. Of the 21 SHOPP transportation projects evaluated, none are forecast to affect least Bell's vireo habitat in the coastal zone that is under CCC's jurisdiction (Caltrans 2021b).

5.3.4. Potential Co-benefiting Species

The species of mitigation need co-occur with other protected plant, invertebrate, amphibian, reptile, bird, and mammal species. By procuring or establishing advance mitigation credits for one or more of the species of mitigation need, Caltrans District 11 will also benefit multiple special-status species that occur and utilize the same habitats.

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

- an additional 74 special-status terrestrial species that potentially use the same habitats as the species of mitigation need in the Southern California Coast Ecoregion Section (Table 5-6), and
- an additional 68 special-status terrestrial species that potentially use the same habitats as the species of mitigation need in the Southern California Mountains and Valleys Ecoregion Section (Table 5-7).

Table 5-6. Estimated SHOPP Impacts on Species of Mitigation Need and Co-occurring Species Habitat: Southern California Coast Ecoregion Section (acres)

Common Name	Species Name	Status	Annual Grassland	Chamise-Redshank Chaparral	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
Not applicable	Not applicable	**Total**	**0.4**	**0.3**	**0.2**	**2.8**	**1.5**	**0.4**	**0.5**
Species of Mitigation Need	See below	See below	See below	See below	See below	See below	See below	See below	See below
Coastal California gnatcatcher	*Polioptila californica*	FT, SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Least Bell's vireo	*Vireo bellii pusillus*	FE, SE	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below
San Diego thorn-mint	*Acanthomintha ilicifolia*	FT, SE	0.4	0.0	0.0	2.8	0.0	0.4	0.0
San Diego ambrosia	*Ambrosia pumila*	FE	0.4	0.0	0.0	2.8	0.0	0.4	0.0
Del Mar manzanita	*Arctostaphylos glandulosa* ssp. *crassifolia*	FE	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Coastal dunes milk-vetch	*Astraglus tener* var. *titi*	FE, SE	0.0	0.0	0.0	2.5	0.0	0.0	0.0
Encinitas baccharis	*Baccharis vanessae*	FT, SE	0.0	0.0	0.0	0.0	0.0	0.4	0.0
Nevin's barberry	*Berberis nevinii*	FE, SE	0.0	0.0	0.0	2.8	0.0	0.4	0.0
Thread-leaved brodiaea	*Brodiaea filifolia*	FT, SE	0.4	0.0	0.0	2.8	0.0	0.4	0.0
Dunn's mariposa lily	*Calochortus dunnii*	FS, SR	0.2	0.0	0.0	0.0	0.0	0.0	0.0

Common Name	Species Name	Status	Annual Grassland	Chamise-Redshank Chaparral	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
Salt marsh bird's-beak	*Chloropyron maritimum* ssp. *maritimum*	FE, SE	0.0	0.0	0.0	2.5	0.0	0.0	0.0
Orcutt's spineflower	*Chorizanthe orcuttiana*	FE, SE	0.0	0.0	0.0	2.5	0.0	0.4	0.0
Otay tarplant	*Deinandra conjugens*	FT, SE	0.4	0.0	0.0	2.8	0.0	0.0	0.0
Mojave tarplant	*Deinandra mohavensis*	FS, SE	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Short-leaved dudleya	*Dudleya brevifolia*	SE	0.0	0.0	0.0	2.5	0.0	0.4	0.0
San Diego button-celery	*Eryngium aristulatum* var. *parishii*	FE, SE	0.4	0.0	0.0	2.8	0.0	0.0	0.0
Roderick's fritillary	*Fritillaria roderickii*	SE	0.4	0.0	0.0	2.8	0.0	0.0	0.0
Orcutt's hazardia	*Hazardia orcuttii*	ST	0.0	0.0	0.0	2.5	0.0	0.4	0.0
Willowy monardella	*Monardella viminea*	FE, SE	0.0	0.0	0.0	2.5	0.0	0.4	0.4
Spreading navarretia	*Navarretia fossalis*	FT	0.4	0.0	0.0	0.0	0.0	0.0	0.0
California Orcutt grass	*Orcuttia californica*	FE, SE	0.4	0.0	0.0	0.0	0.0	0.0	0.0
Baja California birdbush	*Ornithostaphylos oppositifolia*	SE	0.0	0.0	0.0	0.0	0.0	0.4	0.0
San Diego mesa mint	*Pogogyne abramsii*	FE, SE	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Otay Mesa mint	*Pogogyne nudiuscula*	FE, SE	0.2	0.0	0.0	0.0	0.0	0.0	0.0
Small-leaved rose	*Rosa minutifolia*	SE	0.0	0.0	0.0	0.3	0.0	0.0	0.0
Invertebrates	See below	See below	See below	See below	See below	See below	See below	See below	See below
San Diego fairy shrimp	*Branchinecta sandiegonensis*	FE	0.2	0.3	0.0	1.8	0.0	0.0	0.0

Common Name	Species Name	Status	Annual Grassland	Chamise-Redshank Chaparral	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
Quino checkerspot butterfly	*Euphydryas editha quino*	FE	0.0	0.0	0.0	0.6	0.0	0.1	0.0
Hermes copper butterfly	*Lycaena hermes*	FT, FS	0.0	0.0	0.0	0.5	0.0	0.1	0.0
Riverside fairy shrimp	*Streptocephalus woottoni*	FE	<0.1	0.0	0.0	0.0	0.0	0.0	0.0
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below	See below
Arroyo toad	*Anaxyrus californicus*	FE, SSC	0.0	0.0	0.0	0.0	0.1	0.4	0.5
California red-legged frog	*Rana draytonii*	FT, SSC	0.4	0.0	0.2	2.8	1.5	0.4	0.5
Western spadefoot	*Spea hammondii*	FS, SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.0
Reptiles	See below	See below	See below	See below	See below	See below	See below	See below	See below
California legless lizard	*Anniella pulchra*	FS, SSC	0.0	0.3	0.2	2.8	1.5	0.4	0.5
Orange-throated whiptail	*Aspidoscelis hyperythra*	FS	0.0	0.3	0.2	2.8	0.0	0.4	0.0
Red diamond rattlesnake	*Crotalus ruber*	FS, SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Ring-necked snake	*Diadophis punctatus*	FS	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Blainville's horned lizard	*Phrynosoma blainvillii*	FS, SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5

Common Name	Species Name	Status	Annual Grassland	Chamise-Redshank Chaparral	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
Western skink	*Plestiodon skiltonianus*	FS	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Western patch-nosed snake	*Salvadora hexalepis*	SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Two-striped gartersnake	*Thamnophis hammondii*	FS, SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Common gartersnake	*Thamnophis sirtalis*	SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Birds	See below	See below	See below	See below	See below	See below	See below	See below	See below
Tricolored blackbird	*Agelaius tricolor*	FS, ST, SSC	0.4	0.0	0.0	0.0	1.5	0.0	0.5
Grasshopper sparrow	*Ammodramus savannarum*	SSC	0.4	0.0	0.0	0.0	1.5	0.0	0.0
Golden eagle	*Aquila chrysaetos*	FS, SFP, SFS	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Short-eared owl	*Asio flammeus*	SSC	0.4	0.3	0.2	2.7	1.5	0.4	0.5
Long-eared owl	*Asio otus*	SSC	0.4	0.3	0.2	0.0	1.5	0.4	0.5
Burrowing owl	*Athene cunicularia*	FS, SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
San Diego cactus wren	*Campylorhynchus brunneicapillus sandiegensis*	FS, SSC	0.0	0.0	0.0	1.0	0.0	0.0	0.0
Northern harrier	*Circus [cyaneus] hudsonius*	SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5

Common Name	Species Name	Status	Annual Grassland	Chamise-Redshank Chaparral	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
White-tailed kite	*Elanus leucurus*	FS, SFP	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Peregrine falcon	*Falco peregrinus*	SFS, SFP	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Bald eagle	*Haliaeetus leucocephalus*	FS, SE, SFP, SFS	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Yellow-breasted chat	*Icteria virens*	SSC	0.0	0.0	0.0	1.1	0.0	0.0	0.2
Loggerhead shrike	*Lanius ludovicianus*	SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Savannah sparrow	*Passerculus sandwichensis*	SE	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Oregon vesper sparrow	*Pooecetes gramineus affinis*	SSC	0.3	0.0	0.2	0.0	0.0	0.0	0.0
Yellow warbler	*Setophaga petechia*	SSC	0.0	0.3	0.2	2.8	1.5	0.4	0.5
Mammals	See below	See below	See below	See below	See below	See below	See below	See below	See below
Pallid bat	*Antrozous pallidus*	FS, SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Ringtail	*Bassariscus astutus*	SFP	0.4	0.3	0.2	2.8	1.5	0.4	0.5
California pocket mouse	*Chaetodipus californicus*	SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.0
San Diego pocket mouse	*Chaetodipus fallax*	SSC	0.4	0.3	0.0	2.8	0.0	0.4	0.0
Hog-nosed bat	*Choeronycteris Mexicana*	SSC	0.0	0.0	0.0	0.0	1.5	0.0	0.0

Common Name	Species Name	Status	Annual Grassland	Chamise-Redshank Chaparral	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
Townsend's big-eared bat	*Corynorhinus townsendii*	FS, SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Spotted bat	*Euderma maculatum*	FS, SSC	0.4	0.0	0.2	2.8	1.5	0.0	0.5
Western mastiff bat	*Eumops perotis*	FS, SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Western red bat	*Lasiurus blossevillii*	SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Western yellow bat	*Lasiurus xanthinus*	SSC	0.0	0.0	0.2	0.0	0.0	0.0	0.5
Black-tailed jackrabbit	*Lepus californicus*	SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Small-footed myotis	*Myotis ciliolabrum*	SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Long-eared myotis	*Myotis evotis*	FS	0.0	0.3	0.2	2.8	1.5	0.4	0.5
Fringed myotis	*Myotis thysanodes*	FS	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Yuma myotis	*Myotis yumanensis*	FS	0.4	0.3	0.2	2.8	1.5	0.4	0.5
Desert woodrat	*Neotoma lepida*	SSC	0.0	0.3	0.0	2.8	0.0	0.4	0.0
Southern grasshopper mouse	*Onychomys torridus*	SSC	0.4	0.0	0.0	2.8	0.0	0.4	0.5
Little pocket mouse	*Perognathus longimembris*	FE, SSC	0.0	0.3	<0.1	2.6	0.0	0.4	0.0
American badger	*Taxidea taxus*	SSC	0.4	0.3	0.2	2.8	1.5	0.4	0.5

Source: Caltrans 2021b
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

Table 5-7. Estimated SHOPP Impacts on Species of Mitigation Need and Co-occurring Species Habitat: Southern California Mountains and Valleys Ecoregion Section (acres)

Common Name	Species Name	Status	Annual Grassland	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
Not applicable	Not applicable	**Total**	**0.8**	**0.6**	**1.2**	**0.1**	**0.8**	**0.1**
Species of Mitigation Need	See below	See below	See below	See below	See below	See below	See below	See below
Coastal California gnatcatcher	*Polioptila californica californica*	FT, SSC	0.2	0.1	0.9	0.1	0.1	<0.1
Least Bell's vireo	*Vireo bellii pusillus*	FE, SE	0.0	0.0	0.0	0.0	0.0	0.0
Plants	See below	See below	See below	See below	See below	See below	See below	See below
San Diego thorn-mint	*Acanthomintha ilicifolia*	FT, SE	0.8	0.0	1.2	0.0	0.8	0.0
San Diego ambrosia	*Ambrosia pumila*	FE	0.8	0.0	1.2	0.0	0.8	0.0
Encinitas baccharis	*Baccharis vanessae*	FT, SE	0.0	0.0	0.0	0.0	0.8	0.0
Nevin's barberry	*Berberis nevinii*	FE, SE	0.0	0.0	1.2	0.0	0.8	0.0
Thread-leaved brodiaea	*Brodiaea filifolia*	FT, SE	0.8	0.0	1.2	0.0	0.8	0.0
Dunn's mariposa lily	*Calochortus dunnii*	FS, SR	0.8	0.0	0.0	0.0	0.8	0.0
Otay tarplant	*Deinandra conjugens*	FT, SE	0.8	0.0	1.2	0.0	0.0	0.0
Cuyamaca larkspur	*Delphinium hesperium* ssp. *cuyamacae*	FS, SR	0.8	0.0	0.0	0.0	0.0	0.0
Cuyamaca Lake downingia	*Downingia concolor* var. *brevior*	SE	0.8	0.0	0.0	0.0	0.0	0.0
San Diego button-celery	*Eryngium aristulatum* var. *parishii*	FE, SE	0.8	0.0	1.2	0.0	0.0	0.0

Common Name	Species Name	Status	Annual Grassland	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
Mexican flannelbush	*Fremontodendron mexicanum*	FE, SR	0.0	0.0	0.0	0.0	0.8	0.0
Roderick's fritillary	*Fritillaria roderickii*	SE	0.8	0.0	1.2	0.0	0.0	0.0
Parish's meadowfoam	*Limnathes alba* ssp. *parishii*	FS, SE	0.8	0.0	0.0	0.0	0.0	0.0
Spreading navarretia	*Navarretia fossalis*	FT	0.8	0.0	0.0	0.0	0.0	0.0
Dehesa nolina	*Nolina interrata*	FS, SE	0.0	0.0	0.0	0.0	0.8	0.0
California Orcutt grass	*Orcuttia californica*	FE, SE	0.8	0.0	0.0	0.0	0.0	0.0
Gander's ragwort	*Packera gander*	SR	0.0	0.0	0.0	0.0	0.8	0.0
Invertebrates	See below	See below	See below	See below	See below	See below	See below	See below
San Diego fairy shrimp	*Branchinecta sandiegonensis*	FE	<0.1	0.0	0.3	0.0	0.0	0.0
Quino checkerspot butterfly	*Euphydryas editha quino*	FE	0.0	0.0	<0.1	0.0	<0.1	0.0
Hermes copper butterfly	*Lycaena hermes*	FT, FS	0.0	0.0	0.0	0.0	0.6	0.0
Riverside fairy shrimp	*Streptocephalus woottoni*	FE	<0.1	0.0	0.0	0.0	0.0	0.0
Amphibians	See below	See below	See below	See below	See below	See below	See below	See below
Arroyo toad	*Anaxyrus californicus*	FE, SSC	0.0	0.0	0.0	0.1	0.8	0.1
Ensatina	*Ensatina eschscholtzii*	FS	0.0	0.6	1.2	0.1	0.9	0.1
California red-legged frog	*Rana draytonii*	FT, SSC	0.8	0.6	1.2	0.1	0.8	0.1
Western spadefoot	*Spea hammondii*	FS, SSC	0.2	0.1	1.1	0.1	0.1	0.0
California newt	*Taricha torosa*	SSC	0.0	0.0	0.0	0.0	0.1	0.0

Common Name	Species Name	Status	Annual Grassland	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
Reptiles	See below	See below	See below	See below	See below	See below	See below	See below
California legless lizard	*Anniella pulchra*	FS, SSC	0.0	0.6	1.2	0.1	0.8	0.1
Orange-throated whiptail	*Aspidoscelis hyperythra*	FS	0.0	0.3	1.2	0.0	0.5	0.0
Red diamond rattlesnake	*Crotalus ruber*	FS, SSC	0.8	0.6	1.2	0.1	0.8	0.1
Ring-necked snake	*Diadophis punctatus*	FS	0.8	0.6	1.2	0.1	0.8	0.1
Blainville's horned lizard	*Phrynosoma blainvillii*	FS, SSC	0.8	0.6	1.2	0.1	0.8	0.1
Western skink	*Plestiodon skiltonianus*	FS	0.8	0.6	1.2	0.1	0.8	0.1
Western patch-nosed snake	*Salvadora hexalepis*	SSC	0.8	0.6	1.2	0.1	0.8	0.1
Two-striped gartersnake	*Thamnophis hammondii*	FS, SSC	0.8	0.6	1.2	0.1	0.8	0.1
Common gartersnake	*Thamnophis sirtalis*	SSC	0.8	0.6	1.2	0.1	0.8	0.1
Birds	See below	See below	See below	See below	See below	See below	See below	See below
Tricolored blackbird	*Agelaius tricolor*	FS, ST, SSC	0.8	0.0	0.0	0.1	0.0	0.1
Grasshopper sparrow	*Ammodramus savannarum*	SSC	0.8	0.0	0.0	0.1	0.0	0.0
Golden eagle	*Aquila chrysaetos*	FS, SFP, SFS	0.8	0.6	1.2	0.1	0.8	0.1
Long-eared owl	*Asio otus*	SSC	0.8	0.6	0.0	0.1	0.8	0.1
Burrowing owl	*Athene cunicularia*	FS, SSC	<0.1	<0.1	0.7	0.0	0.1	0.0
Northern harrier	*Circus [cyaneus] hudsonius*	SSC	0.8	0.6	1.2	0.1	0.8	0.1

Common Name	Species Name	Status	Annual Grassland	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
White-tailed kite	*Elanus leucurus*	FS, SFP	0.8	0.6	1.2	0.1	0.8	0.1
Peregrine falcon	*Falco peregrinus*	SFS, SFP	0.8	0.6	1.2	0.1	0.8	0.1
Bald eagle	*Haliaeetus leucocephalus*	FS, SE, SFP, SFS	0.8	0.6	1.2	0.1	0.8	0.1
Yellow-breasted chat	*Icteria virens*	SSC	0.0	0.0	1.2	0.0	0.0	0.1
Loggerhead shrike	*Lanius ludovicianus*	SSC	0.8	0.6	1.2	0.1	0.8	0.1
Oregon vesper sparrow	*Pooecetes gramineus affinis*	SSC	0.8	0.5	0.0	0.1	0.4	0.0
Yellow warbler	*Setophaga petechia*	SSC	0.0	0.6	1.2	0.1	0.8	0.1
Gray vireo	*Vireo vicinior*	FS, SSC	0.0	0.0	0.0	0.0	0.6	0.0
Mammals	See below	See below	See below	See below	See below	See below	See below	See below
Pallid bat	*Antrozous pallidus*	FS, SSC	0.8	0.6	1.2	0.1	0.8	0.1
Ringtail	*Bassariscus astutus*	SFP	0.8	0.6	1.2	0.1	0.8	0.1
California pocket mouse	*Chaetodipus californicus*	SSC	0.8	0.6	1.2	0.1	0.8	0.0
San Diego pocket mouse	*Chaetodipus fallax*	SSC	0.8	0.6	1.2	0.1	0.8	0.0
Townsend's big-eared bat	*Corynorhinus townsendii*	FS, SSC	0.8	0.6	1.2	0.1	0.8	0.1
Stephens' kangaroo rat	*Dipodomys stephensi*	FT, ST	0.6	0.0	1.1	0.0	0.0	0.0
Spotted bat	*Euderma maculatum*	FS, SSC	0.8	0.6	1.2	0.1	0.0	0.1
Western mastiff bat	*Eumops perotis*	FS, SSC	0.8	0.6	1.2	0.1	0.8	0.1
Western red bat	*Lasiurus blossevillii*	SSC	0.8	0.6	1.2	0.1	0.8	0.1
Western yellow bat	*Lasiurus xanthinus*	SSC	0.0	0.6	0.0	0.0	0.0	0.1

Common Name	Species Name	Status	Annual Grassland	Coastal Oak Woodland	Coastal Scrub	Eucalyptus	Mixed Chaparral	Valley Foothill Riparian
Black-tailed jackrabbit	*Lepus californicus*	SSC	0.8	0.6	1.2	0.1	0.8	0.1
Small-footed myotis	*Myotis ciliolabrum*	SSC	0.8	0.6	1.2	0.1	0.8	0.1
Long-eared myotis	*Myotis evotis*	FS	0.0	0.6	1.2	0.1	0.8	0.1
Fringed myotis	*Myotis thysanodes*	FS	0.8	0.6	1.2	0.1	0.8	0.1
Yuma myotis	*Myotis yumanensis*	FS	0.8	0.6	1.2	0.1	0.8	0.1
Desert woodrat	*Neotoma lepida*	SSC	0.0	0.0	1.2	0.0	0.8	0.0
Southern grasshopper mouse	*Onychomys torridus*	SSC	0.8	0.0	1.2	0.0	0.8	0.1
Little pocket mouse	*Perognathus longimembris*	FE, SSC	0.0	0.5	0.1	0.0	0.5	0.0
American badger	*Taxidea taxus*	SSC	0.8	0.6	1.2	0.6	0.8	0.1

Source: Caltrans 2021b
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

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.

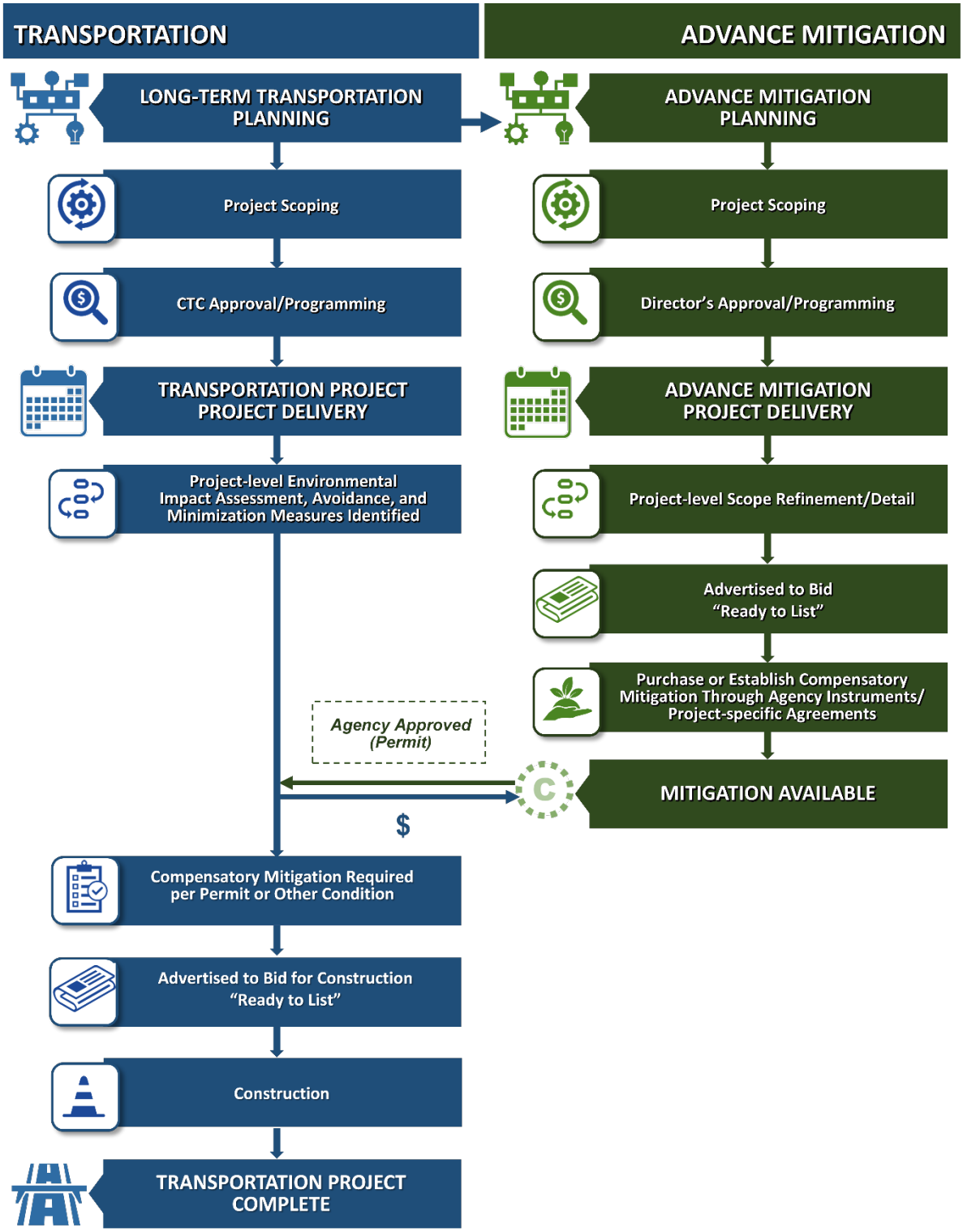
In this chapter, Caltrans summarizes the scheduling considerations and constraints of potential benefiting transportation projects in order to inform advance mitigation project schedules. A timeframe for the forecast advance mitigation needs is provided and analyzed. The potentially benefiting transportation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

6.1 Why Timing is Important

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

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

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



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

6.2 Patterns of Estimated Potential Impacts

Given that the planning horizon for this assessment covers the 2021/22 through 2030/31 fiscal years, and that some of the transportation projects may have already gone to bid, it is necessary to consider which 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 aquatic resource impacts examined relative to their expected advertising date, the compensatory mitigation needs for wetlands, non-wetland waters, and riparian habitat are primarily focused on fiscal years 2022/23 and 2023/24, with smaller needs spread throughout the 10-year planning period. There are no anticipated impacts on threatened and endangered fish.
- As shown in Table 6-2 and on Figure 6-3, when the SHOPP transportation projects identified previously have their forecast species of mitigation need impacts examined relative to their expected advertising date, the compensatory mitigation needs for terrestrial species in the Southern California Coast Ecoregion Section are focused on fiscal years 2022/23, 2023/24, and 2030/31 and largely consist of impacts on coastal California gnatcatcher habitat. Impacts on least Bell's vireo are only forecast for fiscal years 2021/22, 2022/23, and 2023/24.

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

- As shown in Table 6-3 and on Figure 6-4, when the SHOPP transportation projects identified previously have their forecast species of mitigation need impacts examined relative to their expected advertising date, the compensatory mitigation needs are focused solely on coastal California gnatcatcher habitat during fiscal years 2023/24, 2026/27 and 2028/29 for the Southern California Mountains and Valleys Ecoregion Section.

When determining the timing of its compensatory mitigation need, Caltrans District 11 will also take into consideration STIP-eligible project needs qualitatively assessed in Section 5.1.2, which determined that compensatory mitigation needs would be in the latter half of the planning period.

Table 6-1. 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)[a]	Water: Number of Transportation Projects	Water: Estimated Potential Impacts (acres)[a]	Riparian: Number of Transportation Projects	Riparian: Estimated Potential Impacts (acres)[a]
2021/22	0	0.0	1	<0.1	3	<0.1	0	0.0
2022/23	0	0.0	2	0.5	2	1.3	2	0.4
2023/24	0	0.0	2	0.1	5	1.0	1	0.2
2024/25	0	0.0	0	0.0	1	<0.1	0	0.0
2025/26	0	0.0	1	<0.1	1	<0.1	0	0.0
2026/27	0	0.0	1	<0.1	1	0.1	1	<0.1
2027/28	0	0.0	0	0.0	0	0.0	0	0.0
2028/29	0	0.0	1	<0.1	1	<0.1	1	<0.1
2029/30	0	0.0	0	0.0	0	0.0	0	0.0
2030/31	0	0.0	0	0.0	0	0.0	0	0.0
Total[a]	**0**	**0.0**	**8**	**0.7**	**14**	**2.5**	**5**	**0.6**

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

Figure 6-2. Estimated Impacts on Aquatic Resources, by Transportation Project Delivery Year

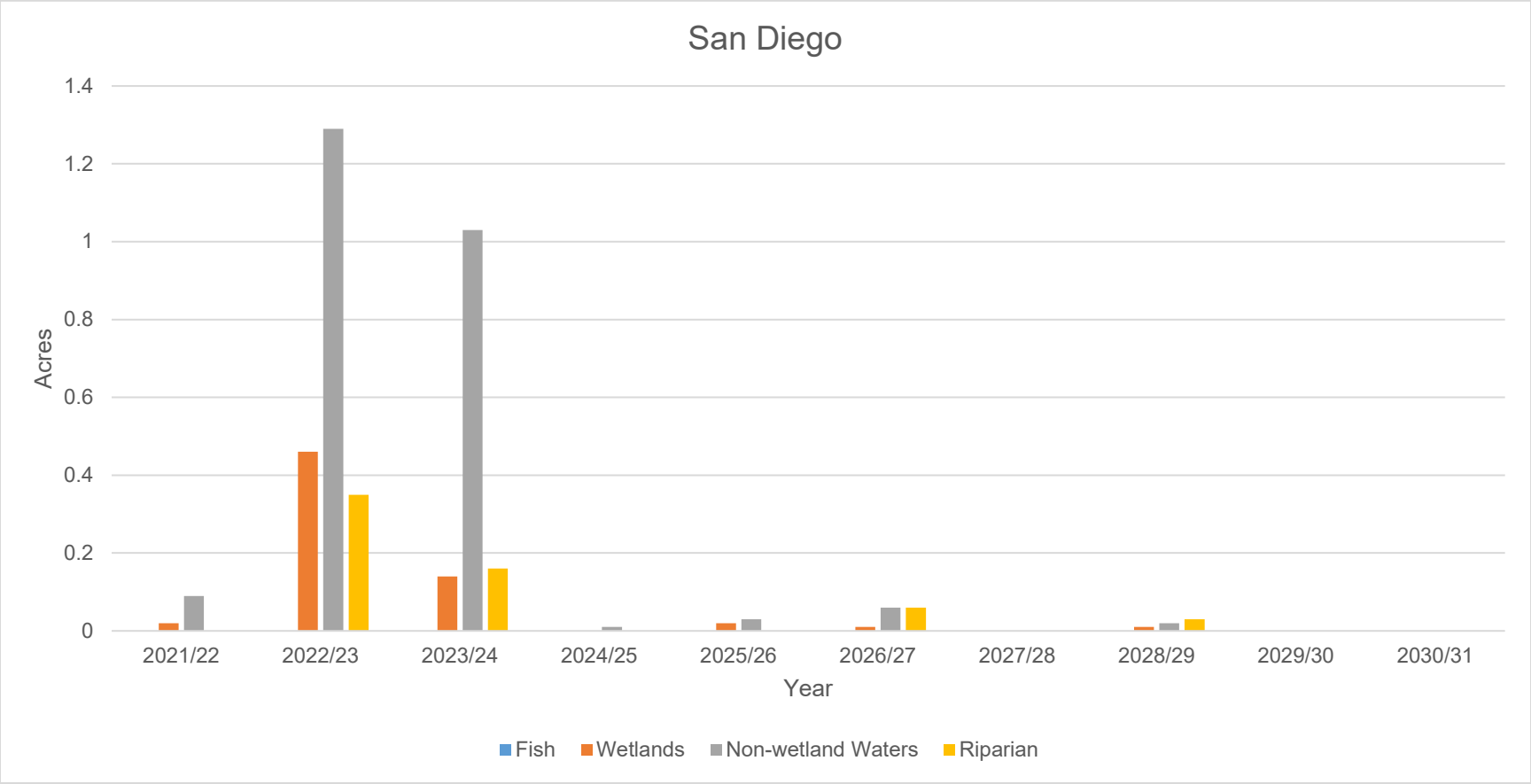


Table 6-2. Southern California Coast Ecoregion Section: Estimated Impacts on Species of Mitigation Need in the GAI, by Transportation Project Delivery Year

Expected Advertisement Year	Coastal California Gnatcatcher: Number of Transportation Projects	Coastal California Gnatcatcher: Estimated Potential Impacts (acres)[a]	Least Bell's Vireo: Number of Transportation Projects	Least Bell's Vireo: Estimated Potential Impacts (acres)[a]
2021/22	2	0.1	0	0.0
2022/23	3	2.3	1	<0.1
2023/24	5	2.3	1	0.2
2024/25	1	1.0	0	0.0
2025/26	0	0.0	0	0.0
2026/27	0	0.0	0	0.0
2027/28	1	0.5	0	0.0
2028/29	0	0.0	0	0.0
2029/30	0	0.0	0	0.0
2030/31	0	0.0	0	0.0
Total[a]	**12**	**6.1**	**2**	**0.2**

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

Figure 6-3. Southern California Coast Ecoregion Section: Estimated Impacts on Species of Mitigation Need in the GAI, by Transportation Project Delivery Year

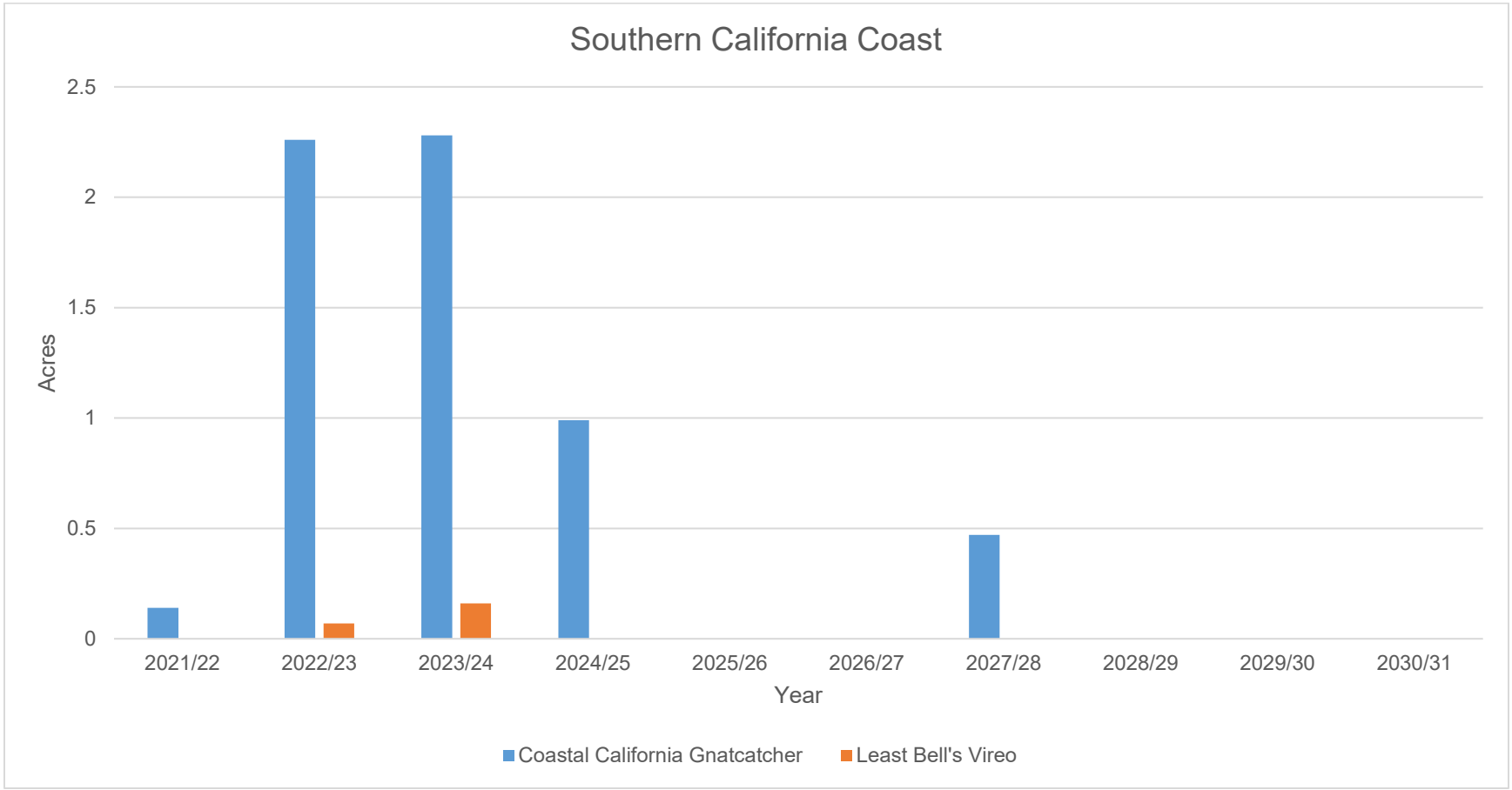
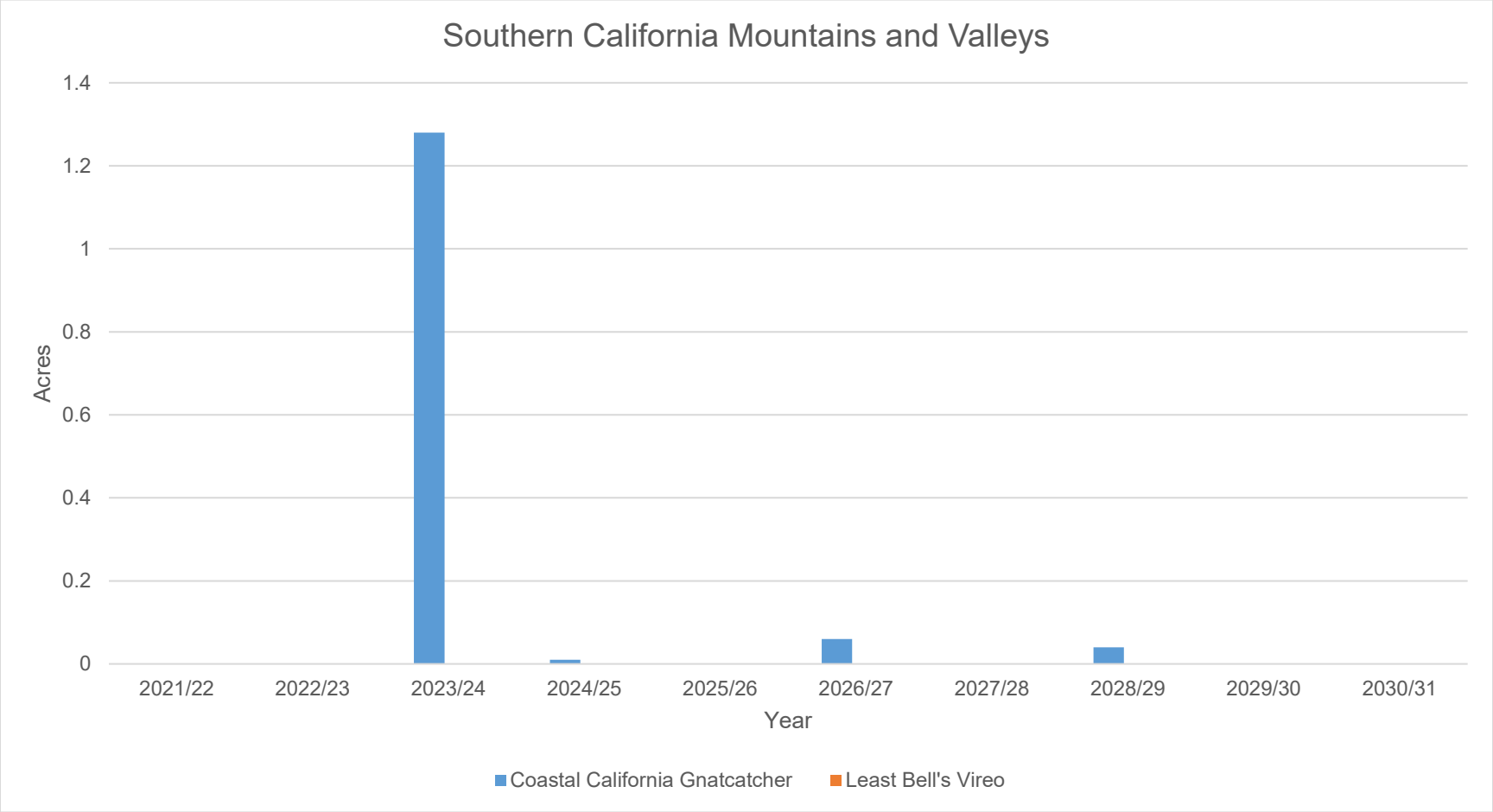


Table 6-3. Southern California Mountains and Valleys Ecoregion Section: Estimated Impacts on Species of Mitigation Need in the GAI, by Transportation Project Delivery Year

Expected Advertisement Year	Coastal California Gnatcatcher: Number of Transportation Projects	Coastal California Gnatcatcher: Estimated Potential Impacts (acres)[a]	Least Bell's Vireo: Number of Transportation Projects	Least Bell's Vireo: Estimated Potential Impacts (acres)
2021/22	0	0.0	0	0.0
2022/23	0	0.0	0	0.0
2023/24	2	1.3	0	0.0
2024/25	1	<0.1	0	0.0
2025/26	0	0.0	0	0.0
2026/27	1	<0.1	0	0.0
2027/28	0	0.0	0	0.0
2028/29	1	<0.1	0	0.0
2029/30	0	0.0	0	0.0
2030/31	0	0.0	0	0.0
Total[a]	**5**	**1.4**	**0**	**0.0**

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

Figure 6-4. Southern California Mountains and Valleys Ecoregion Section: Estimated Impacts on Species of Mitigation Need in the GAI, by Transportation Project Delivery Year



6.3 Acceleration Priorities

At the time of an advance mitigation project proposal, Caltrans' transportation project sequence prioritization will reflect the updated information provided in the most current SHOPP Ten-Year Book and will be based on meeting the Caltrans District's needs and performance targets while financially balancing the Caltrans District's and AMA accounts.

- As shown in Table 6-1 and on Figure 6-2, which are based on Quarter 1 of the Ten-Year Book, most impacts on aquatic resources in the GAI are concentrated in fiscal years 2022/23 and 2023/24, with fewer impacts during the remainder of the 10-year planning period evaluated in the SAMNA and no impacts in fiscal years 2027/28 and 2029/30.
- As shown in Tables 6-2 and 6-3 and on Figures 6-3 and 6-4, most impacts on species of mitigation need are concentrated in fiscal years 2022/23, 2023/24, and 2024/25, with fewer impacts in fiscal years 2021/22, 2026/27, 2027/28, and 2028/29. Most of the projects with advertise dates in fiscal year 2022/23 or earlier may already have required project-specific mitigation associated with transportation project permits (Figure 6-5).
- STIP-eligible transportation projects would likely need compensatory mitigation in fiscal year 2025/26 or later (Section 5.1.2).

Therefore, most projects identified in the 2021/22 to 2030/31 (Quarter 1) SHOPP Ten-Year Book would likely not benefit from an advance mitigation project because project impacts would likely occur prior to advance mitigation project opportunities. Those projects that could benefit from an advance mitigation project initiated post-RAMNA would likely need to be advertised in the 2024/25 or subsequent fiscal years.

At this time, the 2021 SHS Management Plan 2021 priorities are the Caltrans District's priorities, which generally fall in the middle and end of the 10-year assessment period. As a result of the dynamic nature of transportation planning, since the 2021/22 to 2030/31 (Quarter 1) SHOPP Ten-Year Book was published, delivery schedules associated with many transportation projects have changed. For example, the following transportation projects have been delayed:

- SHOPP Project ID 18983 will be delayed from 2021/22 to 2022/23.
- SHOPP Project ID 19044 will be delayed from 2023/24 to 2024/25.

When the delayed SHOPP project impact forecasts and the anticipated STIP-eligible project needs are considered, an advance mitigation project to deliver credits during the latter half of the planning period has the potential to accelerate transportation projects. Prior to proposing advance mitigation projects, Caltrans District 11 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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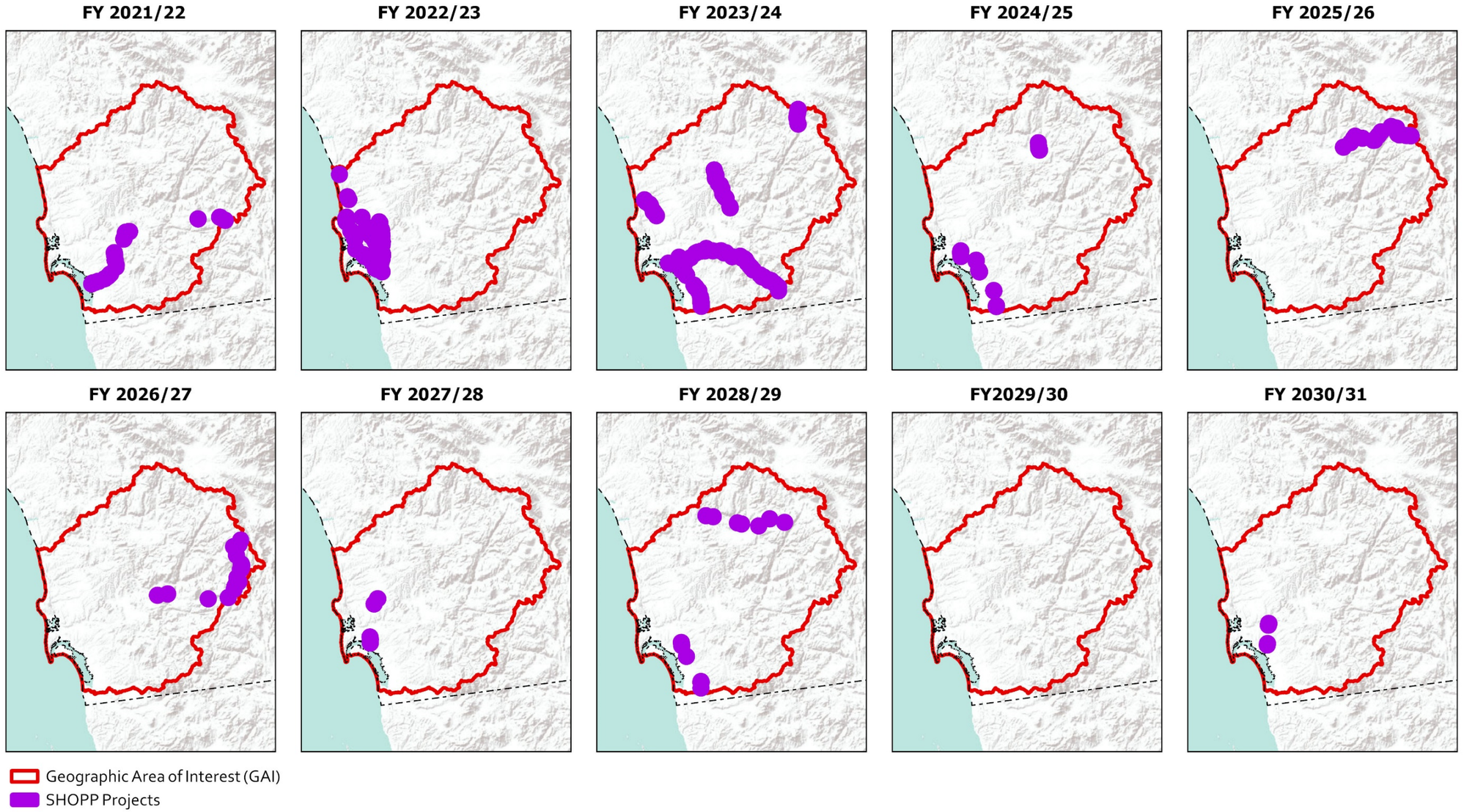
Figure 6-5. Location of SHOPP Estimated Impacts, by Transportation Project Delivery Year



World Terrain Base: Sources: Esri, USGS, NOAA
Appendix A for layer references: [2, 4, 9]

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7. WILDLIFE RESOURCES CONSERVATION GOALS AND OBJECTIVES

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

Caltrans seeks to align its advance mitigation projects with natural resource regulatory agencies' goals and objectives, thus contributing to an improved environmental outcome 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 two wildlife species of mitigation need chosen to focus the assessment, as identified in Section 1.5.
- Next, in Sections 7.4, 7.5, and 7.6, for the species of mitigation need, identifies:
  - Federal and state binding and non-binding regional conservation and land management plans
  - Current and projected pressures and stressors for which there is a potential transportation nexus
  - Opportunities to enhance the conservation benefits through advance mitigation projects
  - Opportunities to benefit other special-status and native 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 results of this analysis are a framework of conservation goals and objectives for use in advance mitigation project scoping (Section 7.7).

7.2 Natural Resource Regulatory Agencies with Wildlife Resources Oversight

Table 7-1 lists the natural resource regulatory agencies with the authority to condition transportation projects delivered in the GAI with wildlife resource-related compensatory mitigation. The aquatic resources used by wildlife, such as streams, wetlands, and non-wetland waters, are regulated by other natural resource regulatory agencies. This RAMNA identifies goals and objectives for aquatic resources 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
CCC	CCC protects the coast by planning for and regulating new development in the coastal zone pursuant to the policies of the Coastal Act. Through the issuance of CDPs, CCC implements the policies of the Coastal Act, including protecting sensitive resources (for example, wetlands, waters, ESHAs), water quality, public access to the coast, and more, and requires mitigation for unavoidable impacts on these resources. CCC also coordinates with local governments in developing and certifying LCPs, which allow local governments to assume the authority to issue CDPs within their jurisdiction. The agency also provides comprehensive guidance to local governments and project applicants regarding planning for and adapting to climate change and sea-level rise. The CCC, agency, or authorized local government with a certified LCP also determines how an ESHA is defined.
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, Section 10(a)(1)(b) of the ESA requires that the impact of any incidental take be minimized and mitigated to the maximum extent practicable. Section 7(a)(1) of the ESA also requires all federal agencies to use their authorities to conserve listed species. Many federal agencies have developed programs to include mitigation as part of the Section 7(a)(2) consultation on their proposed actions to partially fulfill this Congressional mandate. In May 2023, FWS issued a Mitigation Policy that builds upon the guidance in the 1981 Mitigation Policy for recommendations and requirements on mitigating adverse impacts of land and water developments on fish and wildlife, and an ESA Compensatory Mitigation Policy that adopts mitigation principles established in the FWS Mitigation Policy, establishes compensatory mitigation standards, and provides guidance for the application of compensatory mitigation through implementation of the ESA. Conservation banking can assist federal and non-federal participants in the Section 7 and Section 10 process. In May 2003, FWS issued comprehensive federal guidelines designed to promote conservation banks as a tool for mitigating adverse impacts on species; the guidelines foster national consistency by standardizing establishment and operational criteria. Many activities conducted under Section 7 and Section 10 of the ESA result in adverse effects on listed species, including habitat loss or modification. One way to offset these types of impacts is to include in the project design a plan that involves the restoration and/or protection of similar habitat on site and/or off site. Purchasing credits in conservation banks is one method of protecting habitat on site or off site.

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

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

7.3 Species of Mitigation Need

An overview of wildlife resources is provided in Chapter 2, *Environmental Setting*. As described in Section 1.5, species of mitigation need were selected to focus the planning effort and to improve the probability that advance mitigation projects undertaken by Caltrans will yield credits (or similar) that will be usable during the planning period. To this end, the species of mitigation need identified for the GAI are coastal California gnatcatcher and least Bell's vireo. Both species are briefly described below.

7.3.1. Coastal California Gnatcatcher

Coastal California gnatcatcher is a federally threatened bird species and a California species of special concern (Mock 2004). The species ranges from Baja California north through the coastal lowlands of San Diego and Orange Counties, and along the Peninsular Ranges into western Riverside and extreme southwestern San Bernardino Counties, as well as locally in the Palos Verde Peninsula portion of the Los Angeles coast, and in very small numbers as far north as Ventura County (FWS 2022a).

Coastal California gnatcatchers prefer coastal sage scrub habitat dominated by coastal sagebrush (*Artemisia californica*) and California buckwheat (*Eriogonum fasciculatum*). They prefer more open sites over dense sage scrub and are more abundant in areas where the sage scrub interfaces with grassland habitat rather than transitioning to chaparral (Winchell and Doherty 2018). Coastal California gnatcatchers are non-migratory, with individual birds not typically dispersing farther than 10 miles from where they hatch (Mock 2004).

7.3.2. Least Bell's Vireo

Least Bell's vireo is a federally and state endangered subspecies of bird. There are four recognized subspecies of Bell's vireo, two of which nest in California. The least

subspecies is the only subspecies that nests in the GAI. It breeds in the Transverse and Peninsular Ranges, in the coastal foothills and valleys from Ventura County south through San Diego County, and as far east into the Mojave Desert as the Coachella Valley (Kus 2002). There are also isolated breeding populations in the southern Sierra Nevada mountains (Lower Kern River Valley), and rare occurrences of breeding in the central California Coast Range mountains as far north as Santa Clara County. Least Bell's vireo formerly ranged across much of California but was thought to be extirpated from the Central Valley by the late twentieth century. However, a few pairs have been recorded in the Central Valley in recent decades from Merced County north to Yolo County (FWS 2022b).

Least Bell's vireos nest exclusively in riparian habitats, favoring those with native willows and cottonwoods and dense streamside vegetation in which they forage by gleaning insects from foliage. They typically construct their cup-shaped nests less than 5 feet from the ground in the forks of shrub or tree branches. They are a neotropical migrant species, wintering in Baja California, arriving in California to nest in March, and mostly departing the state by the end of September (Kus 2002).

7.4 Regional Conservation Efforts

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

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

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

Document	Reference	Areas of Important Habitat
Special-status Species and Sensitive Habitat Documents	See below	See below
*Coastal California Gnatcatcher (*Polioptila californica californica*) 5-year Review: Summary and Evaluation*	FWS 2010	Identifies 11 NCCP subregional planning areas, including 4 that overlap the GAI: ▪ Eastern San Diego County Multiple Species Conservation Program ▪ Southern San Diego Multiple Species Conservation Program ▪ San Diego Multiple Habitat Conservation Program ▪ Northern San Diego County Multiple Species Conservation Program
*Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule*	FWS 2007	FWS' designation of critical habitat for coastal California gnatcatcher. The following Critical Habitat units are wholly or partially within the GAI: Unit 1, Unit 2, and Unit 3.
*Least Bell's Vireo (*Vireo bellii pusillus*) 5-year Review Summary and Evaluation*	FWS 2006a	Identifies 11 population units of the species, including the following units that are entirely or partially within the GAI: ▪ Dulzura Creek/Jamul Creek/Otay River ▪ Sweetwater River ▪ San Diego River
*Draft Recovery Plan for the Least Bell's Vireo (*Vireo bellii pusillus*)*	FWS 1998a	Outlines recovery strategies and threats to be addressed specific to each of the population units.
Conservation and Land Management Documents	See below	See below
Cañada de San Vicente Land Management Plan	California Department of Parks and Recreation and CDFW 2016	California State Parks and CDFW Management plan for the CDFW-owned Cañada de San Vicente Ecological Reserve. Includes goals to enhance the 76 acres of riparian habitat in the reserve. States that suitable breeding and foraging habitat for coastal California gnatcatcher and least Bell's vireo is present in the reserve.

Document	Reference	Areas of Important Habitat
CEHC	Spencer et al. 2010	Identifies Natural Landscape Blocks and Essential Connectivity Areas in the Southern California Coast and Southern California Mountains and Valleys Ecoregions, which overlap the GAI. There are 15 Essential Connectivity Areas in the Southern California Coast Region and another 18 in the Southern California Mountains and Valleys Ecoregion.
Design Criteria for the Southern California National Forests	USFS 2005	Provides an overall strategy for land management in the Cleveland National Forest. Includes goals to control riparian weed species such as giant reed and tamarisk from forest lands, and in particular to control tamarisk in Santa Ysabel Creek.
Hollenbeck Canyon Wildlife Area Land Management Plan	California Department of Fish and Game 2008	States that coastal California gnatcatcher is known to occur, and least Bell's vireo has a high potential to occur, in the land management plan area. Plan includes goals for the following: ▪ Enhance water features at Hollenbeck Canyon, the upper reach of Jamul Creek, and the portion of Dulzura Creek near the Border Patrol check station. ▪ Remove eucalyptus from and restore the western segment of Jamul Creek within the wildlife area and Dulzura Creek near the old Honey Springs Ranch. ▪ Remove giant reed from and restore Dulzura Creek and an unnamed tributary in the Honey Springs Ranch parcel. ▪ Restore riparian habitat along the unnamed tributary that flows into Hollenbeck Canyon in the west-central portion of the property.
Marine Corps Air Station Miramar Integrated Natural Resources Management Plan	U.S. Marine Corps 2020	Management plan for the base. Includes a goal to eradicate tamarisk and giant reed from the base.
Natural Resource Management Plan for Mission Trails Regional Park	City of San Diego 2019b	City of San Diego's management plan for Mission Trails Regional Park. Includes a goal to eradicate giant reed, tamarisk, pampas grass, and perennial pepperweed from riparian systems in the park.
Naval Base San Diego Integrated Natural Resources Management Plan	U.S. Navy 2014	Management plan for the base. Includes a goal to conduct invasive species control in areas inhabited by the riparian bird, least Bell's vireo, at the Mission Gorge Recreational Facility.
Ramona Grasslands Preserve Resource Management Plan	San Diego County 2013	San Diego County's management plan for the Ramona Grasslands Preserve. Includes a goal to target weed eradication of several riparian species, including giant reed, tamarisk, and perennial pepperweed and a goal to eliminate weeds from Santa Maria Creek.

Document	Reference	Areas of Important Habitat
San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/ Environmental Assessment	FWS 2014	Management plan for the refuge. Includes the following objectives: ▪ Actively manage riparian vegetation along a 4-mile portion of the Sweetwater River; ▪ Maintain and enhance at least 60 vernal pools in 30 acres of the Otay-Sweetwater Unit; ▪ Conserve 12.5 acres of vernal pool habitat in the Del Mar Mesa Vernal Pool Unit; and ▪ Remove at least 90 percent of all woody invasive species from cottonwood-willow riparian forests and oak riparian forests in the refuge.
SWAP	CDFW 2015	The GAI lies within two adjacent ecoregions: the Southern California Coast Ecoregion and Southern California Mountains and Valleys Ecoregion. The SWAP identifies freshwater marsh, California grassland and flowerfields, and American southwest riparian forest and woodland as conservation target habitats in these ecoregions. 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.
County General Plans	See below	See below
County of San Diego General Plan	San Diego County 2011	General plan for San Diego County. Includes a land use designation of open space-conservation.
City General Plans	See below	See below
City of Chula Vista General Plan	City of Chula Vista 2017	General plan for Chula Vista. Includes a goal to enhance and restore the Sweetwater River. Includes an open space land use designation.
City of Escondido General Plan	City of Escondido 2012	General plan for Escondido. Requires a minimum 50-foot buffer from riparian systems. Includes a public land/open space land use designation.
City of Imperial Beach General Plan	City of Imperial Beach 2022	General plan for Imperial Beach. Includes a development buffer of 100 feet from wetlands unless CDFW approves a reduced buffer. Includes an open space land use designation.
City of La Mesa 2012 Centennial General Plan	City of La Mesa 2012	General plan for La Mesa. Includes a land use designation for open space, parks, recreation, and vacant land.
Lemon Grove General Plan	City of Lemon Grove 1996	General plan for Lemon Grove. Includes a land use designation for parks and recreation.
National City General Plan	City of National City 2011	General plan for National City. Requires the preservation of riparian and waterways with a 100-foot buffer from development. Includes a land use designation for open space and recreation.

Document	Reference	Areas of Important Habitat
Poway Comprehensive Plan	City of Poway 2002	General plan for Poway. Sets a minimum 50-foot setback from riparian corridors. Includes a land use designation for open space.
City of San Diego General Plan	City of San Diego 2008	General plan for San Diego. Includes a land use designation of park, open space, and recreation.
Santee General Plan	City of Santee 2007	General plan for Santee. Includes a land use designation for park and open space.
Other Conservation and Management Documents	See below	See below
Conserving California's Coastal Habitats – A Legacy and A Future with Sea Level Rise	Coastal Conservancy and The Nature Conservancy 2018	Statewide coastal conservation plan by the Coastal Conservancy and The Nature Conservancy. Contains plans to maintain and manage coastal lands to be resilient to sea-level rise. Plans include maintaining existing resilient conservation lands, conserving resilient landscapes, managing in place for resilience, conserving potential future habitat areas, and increasing adaptive capacity.

7.5 Pressures and Stressors

Pressures and stressors refer to environmental trends or physical, chemical, or biological factors or conditions that affect the species of mitigation need or its habitat. According to the SWAP (CDFW 2015), a pressure is defined as "an anthropogenic (human-induced) or natural driver that could result in changing the ecological conditions of the target. Pressures can be positive or negative depending on intensity, timing, and duration. Negative or positive, the influence of a pressure to the target is likely to be significant." Additionally, stress is defined in the SWAP as "[a] degraded ecological condition of a target that resulted directly or indirectly from negative impacts of pressures (e.g., habitat fragmentation)" (CDFW 2015). The *Coastal California Gnatcatcher 5-year Review: Summary and Evaluation* (FWS 2010), the *Draft Recovery Plan for the Least Bell's Vireo* (FWS 1998a), and *Least Bell's Vireo 5-year Review Summary and Evaluation* (FWS 2006a) refer to these pressures and stressors as threats.

The plans included in Table 7-2 identify multiple pressures and stressors contributing to the decline of the species of mitigation need within their ranges. These pressures and stressors were evaluated with regard to whether they are types of effects that could result from, or be worsened by, 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 the 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.

The loss and fragmentation of coastal scrub habitat in conjunction with urban and agricultural development were considered significant threats to coastal California gnatcatcher at the time of its listing (FWS 2007). Since then, implementation of NCCPs/HCPs has done much to reduce this threat to the species by establishing core areas and linkage habitat within its range. Loss and modification of riparian habitat is considered the primary driver of declines in least Bell's vireo populations. Urbanization, agricultural development, and human-caused modification of stream flow regimes have caused considerable loss and degradation of natural riparian habitats throughout its range (FWS 1998a).

7.5.2. Invasive Species

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

A number of invasive plant species, such as tocalote, artichoke thistle, red brome, Russian thistle (*Salsola tragus*), pampas grass, fennel, black mustard, fountain grass, freeway iceplant, and ripgut brome, may degrade habitat quality for coastal California gnatcatcher (CDFW 2015). Giant reed, a common invasive plant species in riparian areas, may form dense, monotypic clusters that are unsuitable for nesting least Bell's vireos (FWS 2006a). Brown-headed cowbirds are known to parasitize nests of coastal California gnatcatchers and least Bell's vireos. Cowbirds thrive in human-altered habitats such as suburban and agricultural areas, and their populations and range have expanded into California from their original native range in the Great Plains region with increased human presence on the landscape (CDFW 2015; FWS 1998a).

7.5.3. Disease and Predation

Coastal California gnatcatchers are subject to a high rate of nest predation, especially from snakes and corvids (birds in the crow family). However, they often re-nest after predation events, which bolsters their fecundity (ability to produce offspring) and likely counteracts the effects of this high rate of predation on their populations (FWS 2010). Least Bell's vireos are also subject to substantial rates of nest predation from a wide variety of bird, mammal, and reptile species. However, nest predation in this species does not appear to be higher than what is observed with other similar passerine bird species and, in general, predation is not considered to be a major threat to coastal California gnatcatcher or least Bell's vireo populations (FWS 2006a, 2010). Disease is also not considered to be a major threat to coastal California gnatcatcher or least Bell's vireo. West Nile virus is a mosquito-borne disease that causes high rates of mortality in certain bird species and not in others. There have been periods when this disease has been quite prevalent in southern California but to date there is no evidence suggesting that populations of either coastal California gnatcatcher or least Bell's vireo have been substantially affected by it or any other disease (FWS 2006a, 2010).

7.5.4. Climate Change, Drought, Wildfire, and Sea-level Rise

Section 2.5 provides a brief overview of the GAI's climate and available planning-level predictions for climate change in the region. In the next 30 years, the climate is expected to change. Predicted climate change effects consist of projected extended periods of higher temperatures in the summer; large fluctuations in precipitation, with dry years becoming drier and wet years becoming wetter; and an increased risk of drought, wildfires, and landslides (Caltrans 2019b). Figure 2-7 depicts the terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a). Higher resilience is clearly shown in the eastern part of the GAI in the Peninsular Ranges. The predicted climate resilience of the GAI ranges from areas with low resilience or no data, located in the western half of the GAI, to areas with moderate to high resilience, located in the eastern half of the GAI. Terrestrial connectivity in the GAI is depicted on Figure 2-12, which shows large remaining blocks of intact habitat and natural landscapes. 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.

Climate change is expected to bring with it an increased risk of wildfires (Caltrans 2019b), which could be extremely detrimental to coastal California gnatcatcher, which occupies coastal scrub communities. Following fires, native coastal scrub vegetation is often outcompeted by nonnative annual grasses, which can dominate the system and permanently alter the habitat (FWS 2010), rendering it less appropriate for coastal California gnatcatchers. Drought can have mixed effects on different bird species, decreasing nesting success in many cases while improving it in other cases depending on specific microhabitat conditions. However, the increased duration and severity of drought driven by climate change that is predicted for California is expected to have a severely negative long-term impact on many bird populations.

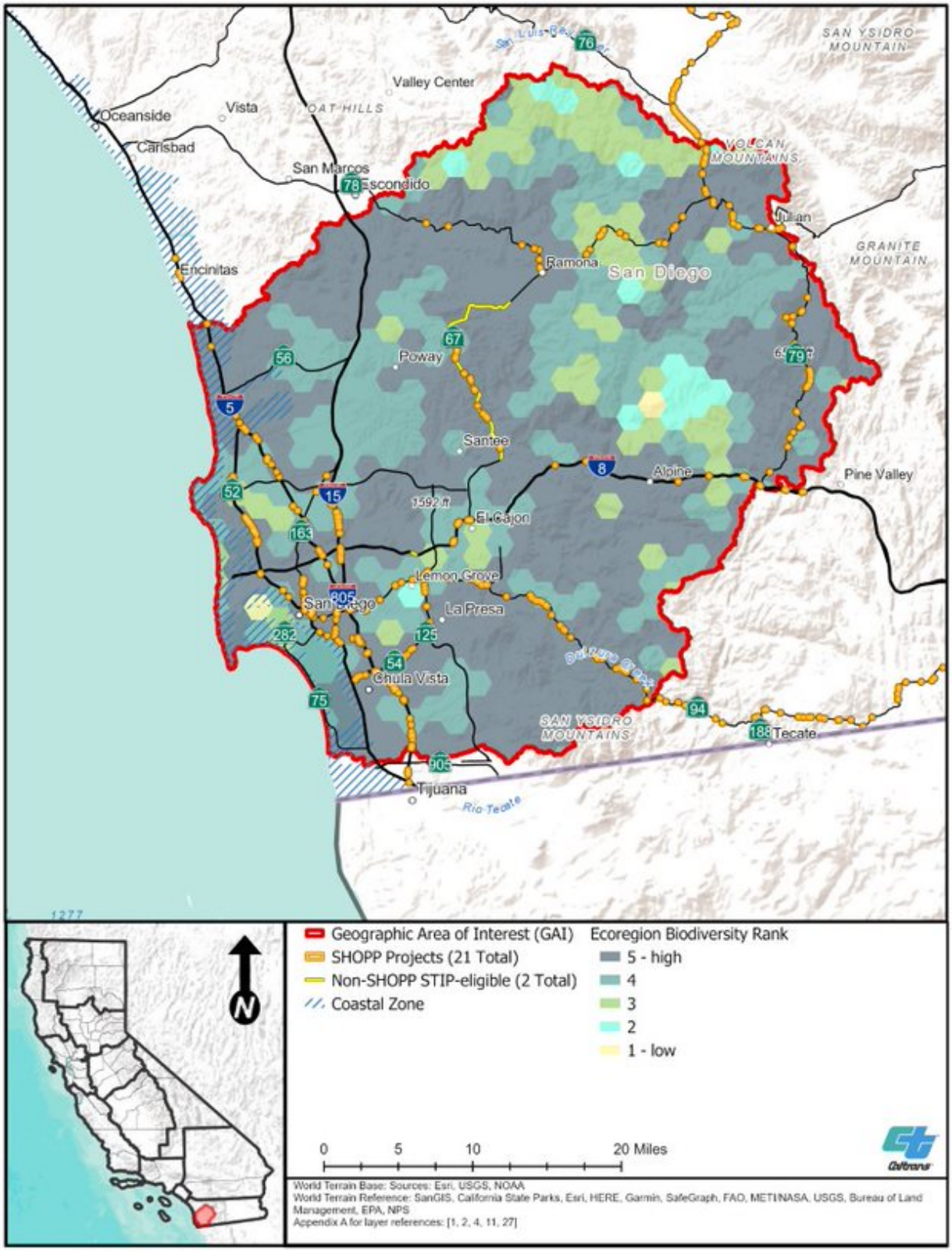
7.5.5. Contaminants

Pesticides, herbicides, mineral fertilizers, industrial chemicals, and airborne pollutants are known to have negative effects on wildlife. Since their introduction in the 1990s, neonicotinoids (systemic agricultural insecticides resembling nicotine) have become the most widely used insecticides in the world. More study is needed to determine the effects of neonicotinoid insecticides on coastal California gnatcatchers and least Bell's vireos specifically. However, recent studies have shown that the reproductive toxicity of neonicotinoids to birds is high and that, because of their systemic effect and persistence in the soil and groundwater, exposure to birds is a chronic risk long after introduction (American Bird Conservancy 2013).

7.6 Multi-species Benefits

While the species of mitigation need identified for this GAI are coastal California gnatcatcher and least Bell's vireo, 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 two-striped gartersnake (*Thamnophis hammondii*), tricolored blackbird (*Agelaius tricolor*), and San Diego black-tailed jackrabbit (*Lepus californicus bennettii*), 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. Arroyo toad could also potentially benefit from advance mitigation planning. 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 almost all of the SHS with SHOPP projects within the GAI. Habitats are mapped in Appendix D, *Land Cover Types*, and the other special-status species that may occur in these habitats are provided in Appendix E, *Complete SAMNA Species Results*.

Figure 7-1. Terrestrial Biodiversity in the GAI



The installation of artificial bat roosts, culvert ramps, undercrossings, and deer jumpouts to facilitate safe movement across highways would also benefit numerous terrestrial wildlife species. Advance mitigation purchased or established to address anticipated impacts on species of mitigation need may also provide mitigation to compensate for impacts on these other species. Caltrans will consider the special-status species with the potential to co-occur in habitat in order to inform advance mitigation scoping and thereby improve the conservation benefits of mitigation in the GAI.

7.7 Advance Mitigation Conservation Goals and Objectives

The conservation goals and objectives compiled in Table 7-3 are intended to be relevant to anticipated future SHOPP and STIP transportation project mitigation needs, be consistent with the goals and objectives of natural resource regulatory agencies for the species of mitigation need, address pressures and stressors, and support species of mitigation need population recovery and success in the GAI. Each conservation goal is supported by one or more conservation objectives and is meant to further guide Caltrans District 11 toward scoping advance mitigation projects to achieve the desired result specified by the goal. Project-specific objectives will be developed for advance mitigation projects in the future during their project delivery phase in accordance with an instrument, MCA, or other project-specific agreement (Figure 1-2). Project-specific advance mitigation project objectives will be specific, measurable, achievable, relevant, and time-bound.

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

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

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

Objective	Sub-objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-1: Conserve and expand habitat for species of mitigation need within the GAI to support ecosystem functions that are essential to recovery of the species	See below	See below	See below
Objective WILD-1.1: Acquire, protect, restore, and/or enhance habitat of sufficient quantity to offset estimated impacts on species of mitigation need within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-1.1.1:** Identify habitat for species of mitigation need in the GAI and acquire, protect, restore, and/or enhance this habitat such that the greatest functional lift to the species of mitigation need is provided, including consolidating compensatory mitigation. **Sub-Objective WILD-1.1.2:** Prioritize key areas, such as designated critical habitat, movement corridors, and buffer zones. **Sub-Objective WILD-1.1.3:** Prioritize acquisition and/or protection of large blocks of suitable, occupied habitat for the species of mitigation need; lands adjacent to occupied habitat; and/or land that expands or buffers existing occupied protected habitats. **Sub-Objective WILD-1.1.4:** Prioritize land acquisition and/or protection that supports key populations. **Sub-Objective WILD-1.1.5:** Prioritize acquisition, protection, and/or enhancement of SWAP (CDFW 2015) conservation targets: American southwest riparian forest and woodland, California grassland and flowerfields, and freshwater marsh, as shown on 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:** Align with LCP ESHA requirements to prioritize restoration and/or enhancement in ESHAs containing species of mitigation need such that a functional lift to the ESHA is provided, when feasible.	▪ coastal California gnatcatcher ▪ least Bell's vireo	▪ *SWAP* (CDFW 2015) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *Coastal California Gnatcatcher (*Polioptila californica californica*) 5-year Review: Summary and Evaluation* (FWS 2010) ▪ *Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule* (FWS 2007) ▪ *Least Bell's Vireo (*Vireo bellii pusillus*) 5-year Review Summary and Evaluation* (FWS 2006a) ▪ *Draft Recovery Plan for the Least Bell's Vireo (*Vireo bellii pusillus*)* (FWS 1998a) ▪ *Cañada de San Vicente Land Management Plan* (California Department of Parks and Recreation and CDFW 2016) ▪ *Design Criteria for the Southern California National Forests* (USFS 2005) ▪ *Hollenbeck Canyon Wildlife Area Land Management Plan* (California Department of Fish and Game 2008) ▪ *Marine Corps Air Station Miramar Integrated Natural Resources Management Plan* (U.S. Marine Corps 2020) ▪ *Natural Resource Management Plan for Mission Trails Regional Park* (City of San Diego 2019b) ▪ *Naval Base San Diego Integrated Natural Resources Management Plan* (U.S. Navy 2014) ▪ *Ramona Grasslands Preserve Resource Management Plan* (San Diego County 2013) ▪ *San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment* (FWS 2014) ▪ *County of San Diego General Plan* (San Diego County 2011) ▪ *City of Chula Vista General Plan* (City of Chula Vista 2017) ▪ *City of Escondido General Plan* (City of Escondido 2012) ▪ *City of Imperial Beach General Plan* (City of Imperial Beach 2022) ▪ *City of San Diego General Plan* (City of San Diego 2008)

Objective	Sub-objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-2: Preserve, enhance, and increase connectivity between blocks of wildlife habitat to allow for dispersal that will maintain resilience and variability of wildlife populations	See below	See below	See below
Objective WILD- 2.1: Acquire, protect, restore, and/or enhance dispersal corridors within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-2.1.1:** Identify dispersal 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 habitat areas.	▪ coastal California gnatcatcher ▪ least Bell's vireo	▪ *SWAP* (CDFW 2015) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *Coastal California Gnatcatcher (*Polioptila californica californica*) 5-year Review: Summary and Evaluation* (FWS 2010) ▪ *Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule* (FWS 2007) ▪ *Least Bell's Vireo (*Vireo bellii pusillus*) 5-year Review Summary and Evaluation* (FWS 2006a) ▪ *Draft Recovery Plan for the Least Bell's Vireo (*Vireo bellii pusillus*)* (FWS 1998a) ▪ *Cañada de San Vicente Land Management Plan* (California Department of Parks and Recreation and CDFW 2016) ▪ *Design Criteria for the Southern California National Forests* (USFS 2005) ▪ *Hollenbeck Canyon Wildlife Area Land Management Plan* (California Department of Fish and Game 2008) ▪ *Marine Corps Air Station Miramar Integrated Natural Resources Management Plan* (U.S. Marine Corps 2020) ▪ *Natural Resource Management Plan for Mission Trails Regional Park* (City of San Diego 2019b) ▪ *Naval Base San Diego Integrated Natural Resources Management Plan* (U.S. Navy 2014) ▪ *Ramona Grasslands Preserve Resource Management Plan* (San Diego County 2013) ▪ *San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment* (FWS 2014) ▪ *County of San Diego General Plan* (San Diego County 2011) ▪ *City of Chula Vista General Plan* (City of Chula Vista 2017) ▪ *City of Escondido General Plan* (City of Escondido 2012) ▪ *City of Imperial Beach General Plan* (City of Imperial Beach 2022) ▪ *City of San Diego General Plan* (City of San Diego 2008)

Objective	Sub-objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-3: Support resiliency of the landscape to climate change and sea-level rise	See below	See below	See below
Objective WILD-3.1: Acquire, protect, restore, and/or enhance habitat that supports resilience to climate change and sea-level rise 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 2-7). **Sub-Objective WILD-3.1.2:** Prioritize management of invasive species in key areas, such as movement corridors and ESHAs, that may be exacerbated by climate change and sea-level rise and that would provide functional lift for the species of mitigation need and ESHAs.	▪ coastal California gnatcatcher ▪ least Bell's vireo	▪ *SWAP* (CDFW 2015) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *Coastal California Gnatcatcher (*Polioptila californica californica*) 5-year Review: Summary and Evaluation* (FWS 2010) ▪ *Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule* (FWS 2007) ▪ *Least Bell's Vireo (*Vireo bellii pusillus*) 5-year Review Summary and Evaluation* (FWS 2006a) ▪ *Draft Recovery Plan for the Least Bell's Vireo (*Vireo bellii pusillus*)* (FWS 1998a) ▪ *Cañada de San Vicente Land Management Plan* (California Department of Parks and Recreation and CDFW 2016) ▪ *Design Criteria for the Southern California National Forests* (USFS 2005) ▪ *Hollenbeck Canyon Wildlife Area Land Management Plan* (California Department of Fish and Game 2008) ▪ *Marine Corps Air Station Miramar Integrated Natural Resources Management Plan* (U.S. Marine Corps 2020) ▪ *Natural Resource Management Plan for Mission Trails Regional Park* (City of San Diego 2019b) ▪ *Naval Base San Diego Integrated Natural Resources Management Plan* (U.S. Navy 2014) ▪ *Ramona Grasslands Preserve Resource Management Plan* (San Diego County 2013) ▪ *San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment* (FWS 2014) ▪ *County of San Diego General Plan* (San Diego County 2011) ▪ *City of Chula Vista General Plan* (City of Chula Vista 2017) ▪ *City of Escondido General Plan* (City of Escondido 2012) ▪ *City of Imperial Beach General Plan* (City of Imperial Beach 2022) ▪ *City of San Diego General Plan* (City of San Diego 2008) ▪ *Conserving California's Coastal Habitats – A Legacy and A Future with Sea Level Rise* (Coastal Conservancy and The Nature Conservancy 2018)

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.	▪ coastal California gnatcatcher ▪ least Bell's vireo	▪ *SWAP* (CDFW 2015) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *Coastal California Gnatcatcher (*Polioptila californica californica*) 5-year Review: Summary and Evaluation* (FWS 2010) ▪ *Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule* (FWS 2007) ▪ *Least Bell's Vireo (*Vireo bellii pusillus*) 5-year Review Summary and Evaluation* (FWS 2006a) ▪ *Draft Recovery Plan for the Least Bell's Vireo (*Vireo bellii pusillus*)* (FWS 1998a) ▪ *Cañada de San Vicente Land Management Plan* (California Department of Parks and Recreation and CDFW 2016) ▪ *Design Criteria for the Southern California National Forests* (USFS 2005) ▪ *Hollenbeck Canyon Wildlife Area Land Management Plan* (California Department of Fish and Game 2008) ▪ *Marine Corps Air Station Miramar Integrated Natural Resources Management Plan* (U.S. Marine Corps 2020) ▪ *Natural Resource Management Plan for Mission Trails Regional Park* (City of San Diego 2019b) ▪ *Naval Base San Diego Integrated Natural Resources Management Plan* (U.S. Navy 2014) ▪ *Ramona Grasslands Preserve Resource Management Plan* (San Diego County 2013) ▪ *San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment* (FWS 2014) ▪ *County of San Diego General Plan* (San Diego County 2011) ▪ *City of Chula Vista General Plan* (City of Chula Vista 2017) ▪ *City of Escondido General Plan* (City of Escondido 2012) ▪ *City of Imperial Beach General Plan* (City of Imperial Beach 2022) ▪ *City of San Diego General Plan* (City of San Diego 2008)

Objective	Sub-objective	Affected Species[a]	Alignment with Conservation and Management Plans[b]
Goal WILD-5: Prioritize multi-species and multi-resource benefits	See below	See below	See below
Objective WILD-5.1: Acquire, protect, restore, and/or enhance habitat that provides multi-species benefits within the GAI in advance of transportation project impacts.	**Sub-Objective WILD-5.1.1:** Prioritize mitigation to provide benefits to special-status species that may co-occur with the species of mitigation need in key areas and that will provide functional lift to other special-status species within the GAI. **Sub-Objective WILD-5.1.2:** Identify SHS right-of-way areas where enhancement efforts may benefit species of mitigation need. **Sub-Objective WILD-5.1.3:** Align with LCP ESHA requirements to prioritize restoration and/or enhancement actions that provide a functional lift to the ESHA and their resource values, when feasible.	▪ coastal California gnatcatcher ▪ least Bell's vireo	▪ *SWAP* (CDFW 2015) and companion plans ▪ *CEHC* (Spencer et al. 2010) ▪ *Coastal California Gnatcatcher (*Polioptila californica californica*) 5-year Review: Summary and Evaluation* (FWS 2010) ▪ *Revised Designation of Critical Habitat for the Coastal California Gnatcatcher (*Polioptila californica californica*); Final Rule* (FWS 2007) ▪ *Least Bell's Vireo (*Vireo bellii pusillus*) 5-year Review Summary and Evaluation* (FWS 2006a) ▪ *Draft Recovery Plan for the Least Bell's Vireo (*Vireo bellii pusillus*)* (FWS 1998a) ▪ *Cañada de San Vicente Land Management Plan* (California Department of Parks and Recreation and CDFW 2016) ▪ *Design Criteria for the Southern California National Forests* (USFS 2005) ▪ *Hollenbeck Canyon Wildlife Area Land Management Plan* (California Department of Fish and Game 2008) ▪ *Marine Corps Air Station Miramar Integrated Natural Resources Management Plan* (U.S. Marine Corps 2020) ▪ *Natural Resource Management Plan for Mission Trails Regional Park* (City of San Diego 2019b) ▪ *Naval Base San Diego Integrated Natural Resources Management Plan* (U.S. Navy 2014) ▪ *Ramona Grasslands Preserve Resource Management Plan* (San Diego County 2013) ▪ *San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment* (FWS 2014) ▪ *County of San Diego General Plan* (San Diego County 2011) ▪ *City of Chula Vista General Plan* (City of Chula Vista 2017) ▪ *City of Escondido General Plan* (City of Escondido 2012) ▪ *City of Imperial Beach General Plan* (City of Imperial Beach 2022) ▪ *City of San Diego General Plan* (City of San Diego 2008)

[a] This column includes species of mitigation need that could benefit from these objectives.
[b] More information on these plans is provided in Chapter 3, *Relevant Plans, Policies, and Regulations*, and Chapter 4, *Existing Mitigation Opportunities*.

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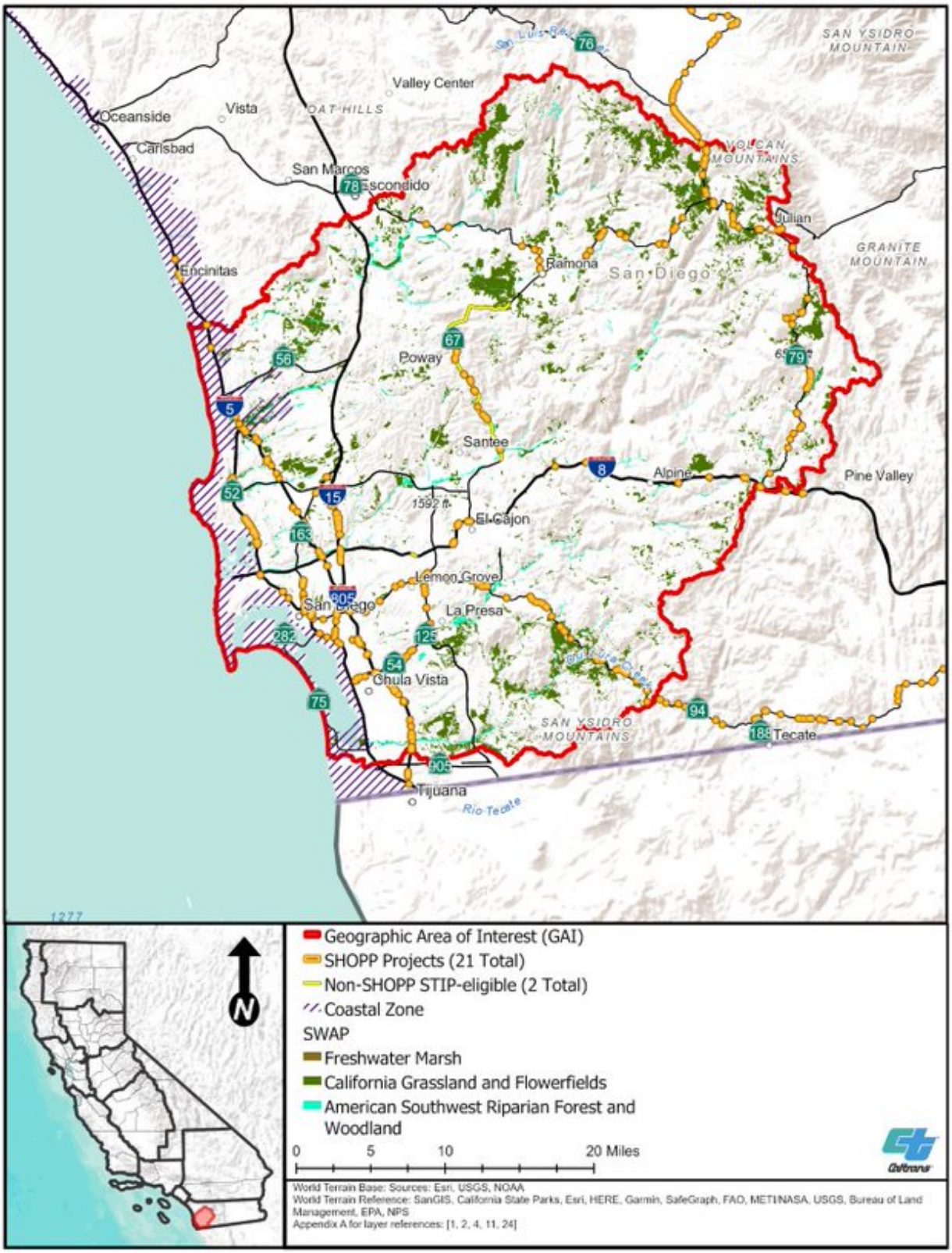
Figure 7-2. SWAP Terrestrial Conservation Target Habitats



7.8 Summary

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

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

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

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

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

vegetation and reducing conditions that favor predators and competitors. These objectives address issues related to habitat loss, fragmentation, and degradation as well as threats from invasive species and predation.

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

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

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8. AQUATIC RESOURCES CONSERVATION GOALS AND OBJECTIVES

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

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

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

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

8.1 Approach

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

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

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

- First, in Section 8.2, identifies natural resource regulatory agencies with the authority to condition transportation projects with aquatic resource-related and riparian habitat compensatory mitigation in the GAI.
- Then, in Section 8.3, summarizes information for the wetland, non-wetland waters, and fish species addressed by the assessment.
- Next, in Sections 8.4, 8.5, and 8.6, for aquatic resources identifies:
  - Federal and state policies and binding and non-binding regional conservation and land management plans
  - Current and projected pressures and stressors, including climate change and sea-level rise, for which there is a transportation nexus
  - Opportunities to enhance the conservation benefits through advance mitigation projects
  - Opportunities to provide co-benefits, where possible, to water quality, groundwater recharge, and species that require aquatic habitats
- Last, Caltrans 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. Natural Resource Regulatory Agencies with the Authority to Approve Aquatic Resource Compensatory Mitigation Credits (or Values)

Agency	Summary
CCC	CCC protects the coast by planning for and regulating new development in the coastal zone pursuant to the policies of the Coastal Act. Through the issuance of CDPs, CCC implements the policies of the Coastal Act, including protecting sensitive resources (for example, wetlands, waters, ESHAs), water quality, public access to the coast, and more, and requires mitigation for unavoidable impacts on these resources. CCC also coordinates with local governments in developing and certifying LCPs, which allow local governments to assume the authority to issue CDPs within their jurisdiction. The agency also provides comprehensive guidance to local governments and project applicants regarding planning for and adapting to climate change and sea-level rise. The CCC, agency, or authorized local government with a certified LCP also determines how an ESHA is defined.
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. According to the 2008 mitigation rule, in general it is the preference of the Corps to use the following order of priority for mitigation: mitigation bank, in-lieu fee program, permittee responsible mitigation under the watershed approach, on-site permittee responsible mitigation, and off-site permittee responsible mitigation, but the preference may change based on what is environmentally preferable.

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

8.3.1. Wetlands and Non-wetland Waters

The GAI conforms to the San Diego HUC-8 boundary (HUC-8 18070304). As such, all named aquatic features in this chapter occur in this HUC-8 boundary. The San Diego River, Sweetwater River, San Dieguito River, Santa Ysabel Creek, and Otay River are the major river systems of the GAI (Section 2.13, Appendix G) (San Diego RWQCB 2021). Additionally, there are hundreds of named and unnamed tributaries, the majority of which flow into these rivers and/or the ocean. Flow into these systems primarily originates from rainfall with some input from snow in the Peninsular Range.

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 42,906 acres of aquatic habitat, consisting of 26 wetland and non-wetland water habitats that are listed in Table 2-7 (Caltrans 2021d, 2021e). Twelve beneficial uses that support the preservation and enhancement of wildlife habitat and aquatic resources also support the AMP's objective to contribute to an improved environmental outcome through transportation project mitigation and are relevant to this RAMNA. They are detailed in Table 2-6.

8.3.2. Riparian Habitat

Because there is currently no detailed riparian GIS layer available, riparian habitat information was excerpted from the SAMNA's vegetation layer. The riparian habitats identified in the GAI are desert riparian, montane riparian, and valley foothill riparian (Table 2-3).

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. For example, some LCPs include ESHAs with aquatic resource attributes. Others identify key qualities, such as water quality, that are essential for aquatic resource enhancement and restoration. Still others name specific features, included 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 8-2.

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

Document	Reference	Information Identified
Policies, Procedures, Guidelines, and Water Quality Plans	See below	See below
2008 Final Compensatory Mitigation Rule	73 *Federal Register* 19593	Corps' ruling to establish standards and criteria for the use of all types of compensatory mitigation, including on- and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts on WOTUS. Recognizes that consolidating mitigation may be environmentally preferable for linear projects (because advance or at least concurrent compensatory mitigation is environmentally preferable but not always possible to achieve) (Preamble and 33 Section 332.3).
303(d) List of Impaired Water Bodies	SWRCB 2021	Section 303(d) of the CWA requires that every 2 years, each state submit to EPA a list of rivers, lakes, and reservoirs in the state for which pollution control or requirements have failed to provide for water quality. Based on a review of this list and its associated Total Maximum Daily Load Priority Schedule (Appendix F), 41 water bodies are listed as impaired in the GAI. Of the 41, 25 have an established total maximum daily load.
California Coastal Act of 1976	CCC 2022	California law that, in part, establishes and protects a coastal zone, sets forth a wetland definition to be regulated, creates broad management policies in the coastal zone, and establishes regulations for coastal zone protection.
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."
Definition and Delineation of Wetlands in the Coastal Zone	CCC 2011	Identifies wetland delineation procedures and the use of a one-parameter approach for identifying a wetland.
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.

Document	Reference	Information Identified
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	SWRCB 2019b	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 Colorado River Region	Colorado River RWQCB 2019	Identifies water quality objectives and beneficial uses for the Colorado River Basin.
Water Quality Control Plan for the San Diego Basin Region	San Diego RWQCB 2021	Identifies water quality objectives and beneficial uses for the San Diego Basin.
Conservation and Land Management Documents	See below	See below
Anza Borrego Desert State Park General Plan	California Department of Parks and Recreation 2005	Includes a general goal to remove tamarisk from all areas of the park, and a specific goal to enhance montane vernal pools around the Lucky 5 Ranch in Rattlesnake Valley occurring at the northeastern edge of the GAI.
Cañada de San Vicente Land Management Plan	California Department of Parks and Recreation and CDFW 2016	Identifies the following goals for the reserve: ▪ Continue removal of tamarisk, Mexican fan palm, and gum in San Vicente Creek. ▪ Enhance all riparian vegetation communities in the reserve.
City of Chula Vista General Plan	City of Chula Vista 2017	Includes a goal to enhance and restore the Sweetwater River corridor.

Document	Reference	Information Identified
City of Chula Vista MSCP Subarea Plan	City of Chula Vista 2003	Includes the following aquatic species for coverage: ▪ Riverside fairy shrimp ▪ San Diego fairy shrimp ▪ Spreading navarretia ▪ California Orcutt grass (*Orcuttia californica*) ▪ Otay mesa mint (*Pogogyne nudiuscula*) ▪ San Diego button-celery (*Eryngium aristulatum* var. *parishii*) ▪ San Diego mesa mint (*Pogogyne abramsii*) The plan includes a general goal for habitat enhancement and/or restoration in Preserve Management Areas. The Otay Ranch Preserve Management Area contains the majority of wetland and riparian habitats in the plan area, including Salt Creek.
City of Poway Subarea HCP/NCCP	City of Poway 1996	This plan does not include aquatic species for coverage and does not select habitat types for conservation in a broad sense. The plan includes a list of property acquisitions that are priorities for inclusion in the City's mitigation area, which are summarized in Table 5-4 of the HCP/NCCP. Property acquisitions that include potential for enhancement and/or restoration of aquatic habitats are identified as Proposed Resource Protection Areas 1, 4a, 4b, 5, 6, 12, and 18. Aquatic features associated with these properties include the San Dieguito River, Rattlesnake Creek, Beeler Creek, and two locally named features called Thompson Creek and Sycamore Creek.
City of San Diego MSCP Subarea Plan	City of San Diego 1997	Goals in this plan related to vernal pools have been superseded by those in the City of San Diego Vernal Pool HCP and are described below in the next row of this table. Includes the following goals: ▪ Remove giant reed, tamarisk, pampas grass, castor bean, and other nonnative species from all creek and river systems in the plan area, particularly in: – Areas that improve habitat for least Bell's vireo – Los Peñasquitos Lagoon – Sorrento Valley – Sycamore Creek ▪ Restore the floodplain in the northeastern corner of Black Mountain Ranch, which is connected downstream to Lusardi Creek. ▪ Restore the riparian corridor at the bottom of McGonigal Canyon and Deer Canyon, which connect downstream to Los Peñasquitos Lagoon. ▪ Replace gum trees with native riparian trees in the plan area. ▪ Restore Santa Maria Creek northeast of the intersection of Bandy Canyon and Ysabel Creek Roads.

Document	Reference	Information Identified
City of San Diego Vernal Pool HCP	City of San Diego 2019a	Includes goals to restore 19 vernal pool sites, occurring in 12 vernal pool complexes, to the point where only periodic maintenance is required for species survival. A complex of species and location-specific goals exist for each of the seven species covered under the plan, which are itemized in detail in Table 5-1 of the plan. All of the vernal pools named in Table 5-1 occur in the GAI. The seven species covered under this plan are: ▪ Riverside fairy shrimp ▪ San Diego fairy shrimp ▪ Spreading navarretia ▪ California Orcutt grass ▪ Otay mesa mint ▪ San Diego mesa mint ▪ San Diego button-celery
Cuyamaca Rancho State Park Final General Plan and Environmental Impact Report	California Department of Parks and Recreation 2015	Includes goals to restore degraded meadows and remove bullfrogs from aquatic features known to be occupied by arroyo toad.
Design Criteria for the Southern California National Forests	USFS 2005	Includes a general goal to control giant reed and tamarisk in the forest, and specifically to remove tamarisk from Santa Ysabel Creek.
Draft Escondido Subarea Plan	City of Escondido 2001	This document is in draft form. The current aquatic habitats targeted for conservation include: ▪ Freshwater marsh ▪ Riparian forest ▪ Riparian scrub ▪ Freshwater (a vegetation category unto itself in the subarea plan) ▪ Disturbed wetland ▪ Natural flood channel/streambed The current aquatic species targeted for coverage, which in this plan are those that are limited to vernal pools, include: ▪ Riverside fairy shrimp ▪ San Diego fairy shrimp ▪ Little mousetail (*Myosurus minimus* ssp. *apus*) ▪ Spreading navarretia ▪ California Orcutt grass

Document	Reference	Information Identified
I-5 North Coast Corridor Public Works Plan/Transportation and Resource Enhancement Program	Caltrans and SANDAG 2016	Includes a goal identifying maintenance and reduction of sedimentation into Los Peñasquitos Lagoon as a potential mitigation opportunity in the Resource Enhancement and Mitigation Program.
Land Management Plan for the Hollenbeck Canyon Wildlife Area	California Department of Fish and Game 2008	Includes goals to enhance Dulzura Creek (in particular the area near the Border Patrol Check Station) and the upper reach of Jamul Creek.
Los Peñasquitos Water Quality Improvement Plan and Comprehensive Load Reduction Plan	Caltrans, City of San Diego, San Diego County, City of Del Mar, and City of Poway 2015	Includes goals to restore salt marsh habitat in Los Peñasquitos Lagoon and to conduct comprehensive restoration for the lagoon.
Marine Corps Air Station Integrated Natural Resources Management Plan	U.S. Marine Corps 2020	Includes goals to enhance and create vernal pool habitat on the base in appropriate areas and identifies 24 potential mitigation areas for non-vernal pool WOTUS resources in the following canyons: Rose Canyon, San Clemente Canyon, Murphy Canyon, and Elanus Canyon.
MSCP County of San Diego Subarea Plan	San Diego County 1998	Includes a goal to increase conserved acreage to specified amounts in the following aquatic habitats, and includes a general goal to enhance them: ▪ Freshwater marsh – 51 acres ▪ Oak riparian forest – 1,856 acres ▪ Riparian forest, woodland, and scrub – 475 acres ▪ Open water – 107 acres ▪ Disturbed wetland – 68 acres ▪ Flood channel – 197 acres
National City LCP Land Use Plan	City of National City 1997	Includes a goal to enhance and restore Paradise Marsh.
Natural Resource Management Plan for Mission Trails Regional Park	City of San Diego 2019b	Includes a goal to continue eradication of giant reed, tamarisk, pampas grass, and perennial pepperweed from riparian areas of the park.

Document	Reference	Information Identified
Otay River Watershed Management Plan	Aspen Environmental Group 2006	The plan area consists of the Otay River HUC-10 (1807030410). Includes high-priority goals to remove nonnative plants from stream systems in the watershed including giant reed, tamarisk, castor bean, and pampas grass, and to restore the Lower Otay River with a focus on enhancing water quality. A medium-priority goal is to restore creeks in urban areas of the watershed. A low-priority goal is to generally restore the Otay River floodplain with no specific focus.
Ramona Grasslands Preserve Resource Management Plan	San Diego County and Department of Parks and Recreation 2013	Includes a goal to remove tamarisk, giant reed, and perennial pepperweed from the preserve, particularly in the Santa Maria Creek corridor. Identifies vernal pools in the southeastern portion of the preserve as appropriate for restoration; however, this is not identified as a goal.
Resource Management Plan for Lusardi Creek Preserve	San Diego County and Department of Parks and Recreation 2009	Includes goals to primarily remove giant reed from the reserve and secondarily remove pampas grass, tamarisk, Mexican fan palm, Peruvian pepper tree, and gum from riparian areas of the reserve.
Peninsula Community Plan and Local Coastal Program Land Use Plan	City of San Diego 1987	Includes a goal to enhance, where possible, Famosa Slough and Famosa Creek Channel.
Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon	FWS 2005	The San Diego Region is covered by the plan, which contains the Ramona, Tierrasanta South, and Otay Mesa core areas. Listed species for recovery that use aquatic habitat in these core areas are covered in the *Recovery Plan for Vernal Pools of Southern California* (FWS 1998b). Additional species that use aquatic habitat that are expected to benefit from this plan in the GAI include western spadefoot toad (*Spea hammondii*) and little mousetail.

Document	Reference	Information Identified
Recovery Plan for Vernal Pools of Southern California	FWS 1998b	The general recovery objective of this plan is to downlist from endangered to threatened a number of species that require vernal pools, and to conserve and enhance vernal pool ecosystems that occur in Southern California such that the long-term survival of each species is ensured. Species to be downlisted include San Diego fairy shrimp, Riverside fairy shrimp, San Diego button-celery, Otay mesa mint, San Diego mesa mint, and California Orcutt grass. An additional goal exists to ensure the long-term conservation of spreading navarretia, which was listed as threatened after publication of this plan. Specific goals for downlisting of these species in this plan that are relevant to the GAI include: ▪ Habitat enhancement and/or restoration in the San Marcos, Otay Mesa, and Ramona vernal pool complexes. ▪ Population trends of the above-mentioned species are stable or increasing for 10 consecutive years.
San Diego Bay National Wildlife Refuge Sweetwater Marsh and South San Diego Bay Units Comprehensive Conservation Plan and Environmental Impact Statement	FWS 2006b	Includes a goal for the South San Diego Bay Unit to restore approximately 650 acres of commercial solar salt ponds into intertidal mudflat and saltmarsh habitats. Includes the following goals for the Sweetwater Marsh Unit: ▪ Restore 13 acres of disturbed upland habitat at the D Street Fill into subtidal, intertidal, and coastal salt marsh habitat. ▪ Remove fill material from 6 acres in the northern part of F&G Street Marsh and restore the area to salt marsh habitat.
San Diego Coastal State Park System General Plan – Torrey Pines State Beach and State Reserve	California Department of Parks and Recreation 1984	Includes a goal to restore tidal influence at the Los Peñasquitos Marsh, which is currently underway.
San Diego County MSCP North County Plan	San Diego County 2009	This document is in draft form and currently includes a requirement for mitigation at 3:1 impacts for wetlands, including vernal pools, with 1 part creation and 2 parts enhancement or restoration. This document also includes a goal for the creation of a mitigation bank for the types of vernal pools specific to the census-designated place of Ramona.

Document	Reference	Information Identified
San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/ Environmental Assessment	FWS 2014	Includes the following goals: ▪ Enhance the Sweetwater River corridor, in particular to benefit least Bell's vireo. ▪ Enhance at least 60 vernal pools covering 30 acres at the Otay-Sweetwater Unit. ▪ Conduct management actions to support ESA-listed species that occur, or historically occurred, along 5 miles of the Sweetwater River and Steele Canyon Creek as well as wetlands present in human-made pools of the refuge. ▪ Remove at least 90 percent of the large nonnative shrubs and trees from riparian forests in the refuge.

8.5 Pressures and Stressors

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

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

8.5.1. Habitat Loss, Fragmentation, and Degradation

Urbanization and other anthropogenic factors such as roads, poor grazing practices, barriers, 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 2015, 2016). In the GAI, the majority of urbanization and development occurs in the northwestern and southwestern corners, particularly west of Interstate 15 and State Route 125 (Figure 2-8).

8.5.2. Invasive Species

Transportation projects and associated ongoing maintenance activities have the potential to introduce and/or spread nonnative, invasive species. When invasive, nonnative species enter an ecosystem, they can disrupt the natural balance, resulting in a reduction of biodiversity, degradation of habitats, alteration of native genetic diversity, shifting of wetland type, and further threats to already endangered or threatened natural resources (CDFW 2016). If invasive plant species become dominant in vernal pool systems, such as Mediterranean barley (*Hordeum marinum*) and annual beard grass (*Polypogon monspeliensis*), many native aquatic species can become sparse or locally extirpated (CDFW 2015). Invasive plant species that affect riparian systems in the GAI include

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

floating water primrose, giant reed, tree of heaven (*Ailanthus altissima*), and Mexican fan palm (Cal-IPC 2022b). Invasive animal species that can damage aquatic ecosystems in general include African clawed frog, bullfrog, bluegill, and fathead minnow. Recently, the goldspotted oak borer beetle and polyphagous shot hole boring beetle, which cause tree mortality and damage forested riparian ecosystems, have come into the San Diego region (CDFW 2015). Additionally, quagga mussels have been found in 12 locations in San Diego County, of which 10 occur inside the GAI and in the Olivenhain Reservoir and Dixon Reservoir occur, outside the GAI (CDFW 2017). Quagga mussels damage aquatic ecosystems by direct predation on native species, outcompeting native species for food, or by damaging riparian trees (CDFW 2015). Quagga mussels are known to cause significant ecosystem and economic damage by eating portions of the food web, overcrowding the bottom of lakes and reservoirs, and clogging water pipe screens and filters (California Science Advisory Panel 2007).

8.5.3. Altered Hydrology, Geomorphology, and Water Quality

Water quality and hydrology can be directly altered by physical barriers such as culverts, dams (including cofferdams), dikes, trash racks, bridges, roads, canals, and other human-made infrastructure, which can have effects both upstream and downstream by truncating connectivity, altering sediment transport processes, altering natural flow regimes, and changing water surface elevations, adding to the downstream loss of habitat. Stable geomorphology and sediment transport are critical to maintaining healthy streams so that degradation and aggradation do not destroy habitats in the stream and riparian and wetland habitats downstream. The loss of wetlands can result in increased flooding and decreased water quality in downstream tributaries. Water diversions, in-channel construction, riparian vegetation reduction, agriculture, alteration of streambed and banks, components of timber management, and point and nonpoint source pollution have affected the aquatic ecosystem by altering historical flooding regimes, erosion, and deposition of sediments that maintain floodplains (CDFW 2015). Vernal pool and seasonal wetland hydrology also may be altered by changes to surface and subsurface flow attributable to road structures, depending on topography, precipitation, and soil types, as can the hydrology that supports freshwater wetland and riparian communities (FWS 2005).

8.5.4. Climate Change, Drought, and Sea-level Rise

Section 2.5 provides a brief overview of the GAI's climate and available planning-level predictions for climate change and sea-level rise for the region. In the next 30 years, the climate is expected to change. Expected changes include extended periods of higher temperatures and more frequent heat waves in the summer; large fluctuations in precipitation, with dry years becoming drier and wet years becoming wetter; sea-level rise; storm surges; cliff retreat attributable to coastal erosion; and an increased risk of wildfire and flooding (Caltrans 2019b). Increased storm surges, sea-level rise, and sea cliff retreat that is projected to occur in the region could cause damage to coastal lagoons and other wetlands (Caltrans 2019b). Additionally, plants in a Mediterranean climate may be particularly sensitive to shifts in precipitation due to inhabiting an area that historically

had consistent weather and precipitation patterns, including those which occur in riparian and wetland habitats (FWS 2014). Climate change is expected to affect freshwater wetland habitats by reducing those away from the coast that are surrounded by upland habitat, with sea-level rise expected to flood those near the coast (CDFW 2015).

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).

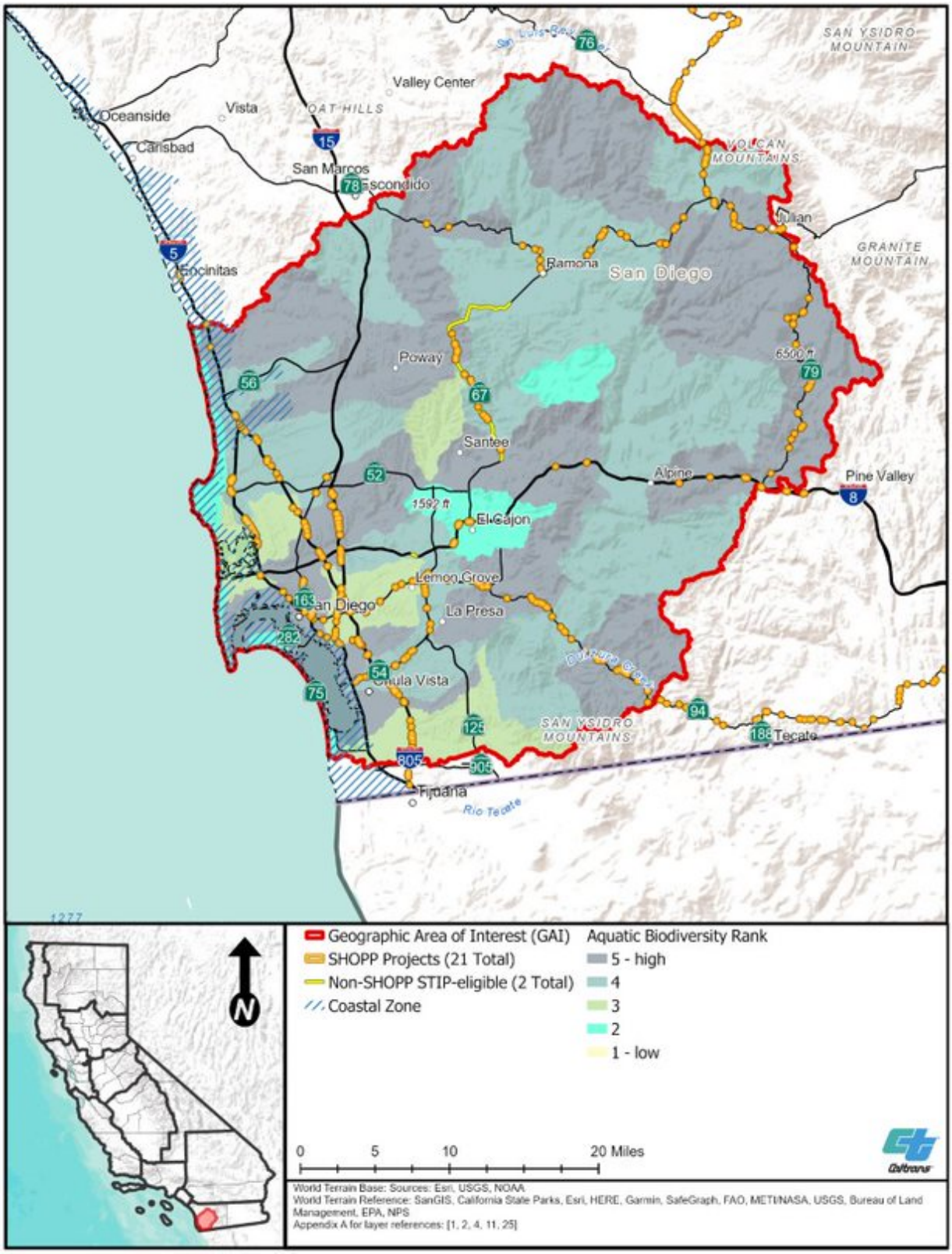
Fire in riparian zones can reduce canopy cover and the amount of woody debris, resulting in increased water temperatures and changes to habitat complexity in the river or stream (CDFW 2015). Santa Ana winds, which are hot and dry winds originating in Great Basin mountain ranges, amplify most wildfires in the San Diego region. An increase in the number of the driest Santa Ana winds is projected; however, the total number of Santa Ana winds is expected to decrease (Kalansky et al. 2018).

8.6 Multi-resource Benefits

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

- Figure 8-1 illustrates the regional aquatic biodiversity in the GAI, as provided by CDFW's ACE GIS dataset. According to these data, high aquatic biodiversity dominates the GAI; however, some areas of medium to low aquatic biodiversity are located along the SHS with planned SHOPP projects, especially in the central portion of the GAI and along the western and southern edges. Large areas with high aquatic biodiversity occur in the northern and eastern portions of the GAI.
- Enhancing and/or restoring the aquatic resources of the GAI is expected to contribute to biologically sustainable populations of special-status aquatic, wetland, and riparian plant and wildlife species. For example, enhancement and/or restoration of seasonal wetland habitat would likely benefit several aquatic and terrestrial species that depend on these types of habitats, such as California red-legged frog.
- 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 spawning habitat would likely improve spawning habitat water quality. Further, enhancement and/or restoration of wetlands adjacent to GAI waters could sequester contaminants on waters identified as 303(d) impaired and/or with an established total maximum daily load.

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, ESHAs, 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 8-3 are intended to be relevant to anticipated future SHOPP transportation project compensatory mitigation needs, be consistent with the goals and objectives of natural resource regulatory agencies for aquatic resources, address pressures and stressors on aquatic resources, and support mitigation success in the GAI. Each conservation goal is supported by one or more conservation objective; objectives are more specific, measurable, achievable, relevant, and time-bound measures that align to a desired result specified by a goal. At the broad scale, these aquatic resources goals and objectives encompass ecological processes, address functions and values of aquatic systems, and prioritize regional conservation that preserves intact aquatic resources, restores aquatic function, and supports climate change planning.

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

The goals, objectives, and sub-objectives presented in Table 8-3 reflect Caltrans' intention to develop advance mitigation project scopes for in-kind mitigation and are intended to reflect the watershed approach, as practiced by natural resource regulatory agencies. The watershed approach is an analytical process through which the Corps, EPA, SWRCB, CCC, and RWQCBs make decisions that support the sustainability or improvement of aquatic resources with the goal of maintaining and improving the quality and quantity of aquatic resources through strategic selection of compensatory mitigation sites. The Corps subscribes to a watershed approach for compensatory mitigation that uses the HUC-based classification system, a topographic watershed-based system, or littoral cell boundary, in the case of coastal and marine resources, depending on the size and location of a transportation or other project (Corps 2015). The Water Boards generally subscribe to an approach for compensatory mitigation decisions that follows the Corps' watershed approach; however, the HU classification system may be used on a case-by-case basis (SWRCB 2019b).

Table 8-3. Advance Mitigation Conservation Goals and Objectives for Aquatic Resources

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-2
Goal AR-1: No net loss of area, functions, 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, LCPs, and other land management plans identified in Table 8-2. **Sub-Objective AR-1.1.3:** Enhance and/or rehabilitate riparian vegetation in the GAI, particularly in Lusardi Creek, San Dieguito River, Sweetwater River, Otay River, and other named and unnamed tributaries into the streams of the San Diego HUC-8. **Sub-Objective AR-1.1.4:** Enhance and/or restore wetland and non-wetland water resource functions, such as connectivity, abundance of native plants, and water quality, that define habitat value for aquatic organisms and increase basin-wide value of resources.	▪ 303(d) List of Impaired Water Bodies (SWRCB 2021) ▪ *Anza Borrego Desert State Park General Plan* (California Department of Parks and Recreation 2005) ▪ *City of Chula Vista General Plan* (City of Chula Vista 2017) ▪ *City of Chula Vista MSCP Subarea Plan* (City of Chula Vista 2003) ▪ *City of Escondido MSCP Subarea Plan* (City of Escondido 2001) ▪ *City of Poway Subarea HCP/NCCP* (City of Poway 1996) ▪ *Definition and Delineation of Wetlands in the Coastal Zone* (CCC 2011) ▪ *Otay River Watershed Management Plan* (Aspen Environmental Group 2006) ▪ *Resource Management Plan for Lusardi Creek Preserve* (San Diego County and Department of Parks and Recreation 2009) ▪ *Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division* (Corps 2015) ▪ *San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment* (FWS 2014) ▪ *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (SWRCB 2019b) ▪ *Strategic Plan to Protect California's Coast and Ocean 2020–2025* (Ocean Protection Council 2019) ▪ *SWAP* (CDFW 2015) ▪ *Wetlands on the Edge. The Future of Southern California's Wetlands. Regional Strategy 2018* (California Coastal Conservancy 2018)
Objective AR-1.2: Avoid a net loss of aquatic resource acreage by establishing aquatic resources.	**Sub-Objective AR-1.2.1:** Establish and/or reestablish wetland and non-wetland waters, particularly in key wetland and non-wetland water habitats that are identified in the SWAP, FWS recovery plans, CDFW recovery plans, LCPs, and other land management plans identified in Table 8-2. **Sub-Objective AR-1.2.2:** Establish and/or reestablish riparian vegetation in the San Diego HUC-8, particularly Lusardi Creek, San Dieguito River, Otay River, and Sweetwater River, and other named and unnamed tributaries into the Pacific Ocean.	▪ Same references as listed with Objective AR-1.1.

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-2
Goal AR-2: Restore and/or enhance the chemical, physical, and biological integrity of wetlands and non-wetland waters	See below	See below
Objective AR-2.1: Protect and enhance water quality.	**Sub-Objective AR-2.1.1:** In coordination with the RWQCB, restore and/or enhance wetland and non-wetland waters with RWQCB biology-related beneficial use designations, such as aquaculture; cold freshwater habitat; estuarine habitat; freshwater replenishment; groundwater recharge; marine habitat; migration of aquatic organisms; preservation of biological habitats of special significance; 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 San Diego HUC-8. **Sub-Objective AR-2.1.3:** In coordination with the RWQCB, implement restoration and enhancement actions that address water quality for aquatic resources, for example, at San Dieguito River and Los Peñasquitos Lagoon, and freshwater and coastal marshes. **Sub-Objective AR-2.1.4:** Restore and/or enhance areas upstream of places with high water quality protection and remediation values, such as ASBSs, ESHA-designated areas, and CCAs. **Sub-Objective AR-2.1.5:** Restore or create adjacent wetlands and non-wetland aquatic features to enhance water quality in tributaries. **Sub-Objective AR-2.1.6:** Rehabilitate and/or enhance small streams and sections of larger streams to remove nonnative plant species that degrade stream water quality, such as perennial pepperweed, Mexican fan palm, Canary Island date palm, castor bean, tree-of-heaven, and giant reed. **Sub-Objective AR-2.1.7:** Improve stream temperatures by increasing shaded riverine aquatic habitat in Lusardi Creek, San Dieguito River, Otay River, San Diego River, and Sweetwater River for fish and other aquatic life.	▪ 303(d) List of Impaired Water Bodies (SWRCB 2018) ▪ *City of San Diego MSCP Subarea Plan* (City of San Diego 1997) ▪ *Los Peñasquitos Water Quality Improvement Plan and Comprehensive Load Reduction Plan* (Caltrans, City of San Diego, San Diego County, City of Del Mar, and City of Poway 2015) ▪ *Otay River Watershed Management Plan* (Aspen Environmental Group 2006) ▪ *Water Quality Control Plan for the Colorado River Basin Region* (Colorado River RWQCB 2019) ▪ *Water Quality Control Plan for the San Diego Basin Region* (San Diego RWQCB 2021)
Objective AR-2.2: Improve surface water hydrology	**Sub-Objective AR-2.2.1:** Restore and/or enhance natural hydrologic regimes, natural sediment transport, and geomorphic processes. **Sub-Objective AR-2.2.2:** Reconnect severed aquatic systems and improve connectivity in aquatic and riparian systems, with particular focus on reconnecting higher watershed areas with lower watershed areas, such as reconnecting tributaries to the San Dieguito, San Diego, and Sweetwater Rivers. **Sub-Objective AR-2.2.3:** Reestablish hydrologic regimes or drainage patterns for better function of depressional wetlands, estuarine and marine wetlands, freshwater emergent wetlands, freshwater forested/shrub wetlands, freshwater ponds, lakes, rivers, and coastal wetlands.	▪ *303(d) List of Impaired Water Bodies* (SWRCB 2018) ▪ *City of San Diego MSCP Subarea Plan* (City of San Diego 1997) ▪ *Resource Management Plan for Lusardi Creek Preserve* (San Diego County and Department of Parks and Recreation 2009) ▪ *MSCP County of San Diego Subarea Plan* (San Diego County 1998) ▪ *National City LCP Land Use Plan* (City of National City 1997) ▪ *San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment* (FWS 2014) ▪ *SWAP* (CDFW 2015)

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-2
Objective AR-2.3: Improve water storage and groundwater recharge	**Sub-Objective AR-2.3.1:** Promote restoration of stream and riparian areas' natural functions to provide water storage and release. **Sub-Objective AR-2.3.2:** Reduce excessive nonnative vegetation along stream/riparian corridors to lower vegetative transpiration rates to sustainable levels and increase water storage in soils and streams. **Sub-Objective AR-2.3.3:** Create or restore wetlands adjacent to streams to enhance groundwater-surface water dynamics in tributaries.	▪ 303(d) List of Impaired Water Bodies (SWRCB 2018) ▪ *Cañada de San Vicente Land Management Plan* (California Department of Parks and Recreation and CDFW 2016) ▪ *City of San Diego MSCP Subarea Plan* (City of San Diego 1997) ▪ *Land Management Plan for the Hollenbeck Canyon Wildlife Area* (CDFW 2008) ▪ *Resource Management Plan for Lusardi Creek Preserve* (San Diego County and Department of Parks and Recreation 2009) ▪ *Marine Corps Air Station Integrated Natural Resources Management Plan* (U.S. Marine Corps 2020) ▪ *MSCP County of San Diego Subarea Plan* (San Diego County 1998) ▪ *Natural Resource Management Plan for Mission Trails Regional Park* (City of San Diego 2019b) ▪ *San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment* (FWS 2014) ▪ *SWAP* (CDFW 2015)
Goal AR-3: Support resiliency of aquatic resources to climate change and sea-level rise	See below	See below
Objective AR-3.1: Reduce impacts from climate change and sea-level rise.	**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, and at tidal flats, salt pannes, and freshwater wetlands to reduce climate change and sea-level rise effects on aquatic resources. **Sub-Objective AR-3.1.2:** Prioritize enhancement and/or restoration that will increase resilience to climate change and sea-level rise such as Los Peñasquitos Lagoon, Famosa Slough, and Sweetwater Marsh. **Sub-Objective AR-3.1.3:** Prioritize riparian areas of the GAI 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 San Diego River, Sweetwater River, San Dieguito River, Santa Ysabel Creek, and Otay River. **Sub-Objective AR-3.1.6:** Prioritize habitat establishment and reestablishment in areas that can also reduce risk in flood-prone systems, particularly in areas along Sweetwater River, San Dieguito River, San Diego River, and Otay River.	▪ *City of San Diego (Peninsula segment) LCP Land Use Plan* (City of San Diego 1987) ▪ *City of San Diego MSCP Subarea Plan* (City of San Diego 1997) ▪ *Los Peñasquitos Water Quality Improvement Plan and Comprehensive Load Reduction Plan* (Caltrans, City of San Diego, San Diego County, City of Del Mar, and City of Poway 2015) ▪ *National City LCP Land Use Plan* (City of National City 1997) ▪ *Otay River Watershed Management Plan* (Aspen Environmental Group 2006) ▪ *San Diego Bay National Wildlife Refuge Sweetwater Marsh and South San Diego Bay Units Comprehensive Conservation Plan and Environmental Impact Statement* (FWS 2006b) ▪ *San Diego Coastal State Park System General Plan – Torrey Pines State Beach and State Reserve* (California Department of Parks and Recreation 1984) ▪ *Strategic Plan to Protect California's Coast and Ocean 2020–2025* (Ocean Protection Council 2019) ▪ *SWAP* (CDFW 2015) ▪ *Wetlands on the Edge. The Future of Southern California's Wetlands. Regional Strategy 2018* (California Coastal Conservancy 2018)

Objective	Sub-Objective	Alignment with Documents Identified in Table 8-2
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, saltcedar, red gum (*Eucalyptus camaldulensis*), tree of heaven, Mexican fan palm, 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, rehabilitate, establish and/or reestablish small (that is, low order) tributaries/streams that discharge into larger rivers such as the San Diego River, Sweetwater River, San Dieguito River, Santa Ysabel Creek, and Otay River. **Sub-Objective AR-3.2.4:** Improve the delivery, accretion, and reuse of sediments in aquatic habitats along the coast to increase the resilience of coastal wetlands and stream systems from the effects of climate change and sea-level rise.	▪ *Cañada de San Vicente Land Management Plan* (California Department of Parks and Recreation and CDFW 2016) ▪ *City of Poway Subarea HCP/NCCP* (City of Poway 1996) ▪ *Design Criteria for the Southern California National Forests* (USFS 2005) ▪ *Resource Management Plan for Lusardi Creek Preserve* (San Diego County and Department of Parks and Recreation 2009) ▪ *Marine Corps Air Station Integrated Natural Resources Management Plan* (U.S. Marine Corps 2020) ▪ *Ramona Grasslands Preserve Resource Management Plan* (San Diego County and Department of Parks and Recreation 2013) ▪ *San Diego Bay National Wildlife Refuge Sweetwater Marsh and South San Diego Bay Units Comprehensive Conservation Plan and Environmental Impact Statement* (FWS 2006b) ▪ *Strategic Plan to Protect California's Coast and Ocean 2020–2025* (Ocean Protection Council 2019) ▪ *SWAP* (CDFW 2015) ▪ *Wetlands on the Edge. The Future of Southern California's Wetlands. Regional Strategy 2018* (California Coastal Conservancy 2018)
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, rehabilitate, establish, and/or reestablish habitats for other aquatic species such as San Diego fairy shrimp, slough anchovy (*Anchoa delicatissima*), and cheekspot goby (*Ilypnus gilberti*). **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. **Sub-Objective AR-4.1.4:** Align with LCP ESHA requirements to prioritize enhancement, rehabilitation, establishment, and/or reestablishment actions that provide a functional lift to the ESHA, when feasible.	▪ *City of Chula Vista MSCP Subarea Plan* (City of Chula Vista 2003) ▪ *City of Escondido MSCP Subarea Plan* (City of Escondido 2001) ▪ *City of San Diego MSCP Subarea Plan* (City of San Diego 1997) ▪ *City of San Diego Vernal Pool HCP* (City of San Diego 2019a) ▪ *Cuyamaca Rancho State Park Final General Plan and Environmental Impact Report* (California Department of Parks and Recreation 2015) ▪ *MSCP County of San Diego Subarea Plan* (San Diego County 1998) ▪ *Recovery Plan for Vernal Pool Ecosystems of California and Southern Oregon* (FWS 2005) ▪ *Recovery Plan for Vernal Pools of Southern California* (FWS 1998b) ▪ *San Diego National Wildlife Refuge Draft Comprehensive Conservation Plan/Environmental Assessment* (FWS 2014) ▪ *SWAP* (CDFW 2015)

8.8 Summary

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

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

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

Regional conservation goals and objectives provide a framework for scoping mitigation credit establishment that would likely successfully offset future transportation project impacts on aquatic resources by creating functional lift or conservation benefit, and by mitigating the pressures and stressors on aquatic resources in the GAI. To summarize Table 8-3:

- **Goal AR-1** seeks to achieve no net loss of area, functions, values, and the condition of wetland and non-wetland water resources in the GAI. The primary objectives associated with this goal are to improve existing wetland and non-wetland water resources and create new ones. The sub-objectives were selected to address the following pressures and stressors: altered hydrology, geomorphology, and water quality; habitat loss, fragmentation, and degradation; invasive species; and wildfire risk.
- **Goal AR-2** seeks to restore and maintain the chemical, physical, and biological integrity of waters. The primary objectives associated with this goal are to protect and enhance water quality, improve surface water hydrology, and improve water storage and groundwater recharge. The sub-objectives were selected to address the following pressures and stressors: altered hydrology, geomorphology, and water quality.
- **Goal AR-3** seeks to support climate resiliency for aquatic resources in the GAI. The primary objectives are to reduce impacts on aquatic resources from climate change and to improve aquatic habitat climate resiliency. The sub-objectives were selected to address the following pressures and stressors: climate change, drought, and sea-level rise; 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 11 will nominate advance mitigation projects to the Caltrans Director and request funding approval (see Step 4 in Figure 1-1, Figure 6-1; Caltrans 2019a). Each advance mitigation project nominated to the Director will consist of a scope, schedule, and cost for an SHC § 800.6(a)-authorized activity. With respect to scope, in this chapter, Caltrans analyzes the information presented previously to identify advance mitigation project scope options that have a high probability of successfully meeting the AMP's transportation project and environmental objectives. Understanding the regulatory framework, environmental setting, available opportunities to purchase credits, impact forecasts, transportation project schedule needs, and natural resource regulatory agency goals and objectives will assist Caltrans District 11 with scoping of SHC § 800.6(a)-authorized activities to be considered further for potential funding by the AMA (see Step 4 of Figure 1-1 and Section 9.4).

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

9.1 Overview of Advance Mitigation Project Scope Development

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

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

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

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

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

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

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

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

9.2 Benefiting Transportation Project Needs Summary

The proximity of planned SHOPP and non-SHOPP STIP-eligible transportation projects to natural resources is shown in figures throughout this document. Estimated transportation project mitigation needs within the GAI for fiscal years 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, 2021/22 to 2030/31, Caltrans District 11 intends to prioritize purchasing or developing mitigation credits or values that address Road Repair and Accountability Act of 2017 (also known as Senate Bill 1) priorities that are planned for the middle and end of the planning period. Given the expected timing of mitigation need, at this time (July of fiscal year 2023/24) mitigation that can be purchased or established by 2025/26 (within the next 2 years) could potentially address mitigation for impacts on aquatic resources in the following sub-basin:

- San Diego Sub-basin:
  - 0.6 acre of wetlands, 2.5 acres of non-wetland waters, and 0.5 acre of riparian habitat impacts, potentially contributing to the acceleration of 8, 14, and 5 transportation projects, respectively

In addition, mitigation that can be purchased or established by 2024/25 (within the next 2 years) for terrestrial resources could potentially address mitigation for impacts on terrestrial species of mitigation need in the following ecoregions:

- Southern California Coast Ecoregion Section:
  - 6.1 acres of coastal California gnatcatcher habitat and 0.2 acre of least Bell's vireo habitat impacts, potentially contributing to the acceleration of 12 and 2 transportation projects, respectively
- Southern California Mountains and Valleys Ecoregion Section:
  - 1.4 acres of coastal California gnatcatcher habitat, potentially contributing to the acceleration of 5 transportation projects

All or some of these needs could form the basis for Caltrans District 11 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. Others have potential but may not be feasible to implement on a schedule to contribute to accelerated transportation project delivery. Further, the activity authorized by SHC § 800.6(a)(4) is only feasible if § 800.6(a)(1)–(3) options are not feasible. Results of the feasibility analysis are summarized in the subsections below and in Table 9-4 (wildlife resources) and Table 9-5 (aquatic resources) later in this chapter.

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

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

Advance Mitigation Project Type	Authorization	Section
Caltrans funds the establishment of a Caltrans or third-party sponsored and operated in-lieu fee program in accordance with applicable state and federal standards.	SHC § 800.6(a)(1)	9.3.8
Caltrans funds the implementation of conservation actions and habitat enhancement actions[c,d] to generate mitigation credits pursuant to an MCA[b] established under a CDFW-approved RCIS.[c] The scope may include Caltrans first entering into or funding the preparation of an MCA.[c] The scope may also include Caltrans first entering into or funding the preparation of an RCIS.[c]	SHC § 800.6(a)(3) SHC § 800.6(a)(3)(A)	9.3.9
Caltrans acquires, restores, manages, monitors, enhances, and preserves lands, waterways, aquatic resources, or fisheries, or funds the acquisition, restoration, management, monitoring, enhancement, and preservation[e] of lands, waterways, aquatic resources, or fisheries, that would measurably advance a conservation objective specified in an RCIS if the department concludes that the action or actions could conserve or create environmental values that are appropriate to mitigate the anticipated potential impacts of planned transportation improvements.	SHC § 800.6(a)(3)(B)	9.3.10
When the other mitigation options (above) are not practicable, Caltrans may perform mitigation in accordance with a programmatic mitigation plan[f] pursuant to SHC § 800.9. The programmatic mitigation plan shall include, to the maximum extent practicable, the information required for an RCIS.[c]	SHC § 800.6(a)(4) SHC § 800.9	9.3.11

[a] Caltrans intends to contract or subcontract implementation tasks when appropriate and as required.
[b] When Caltrans is a permittee under the NCCP, or if Caltrans qualifies as a Participating Special Entity and the project is a covered activity in the NCCP
[c] See: https://www.wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[d] Under specific conditions, fish passage and wildlife crossing structures may qualify as enhancement actions under an RCIS in accordance with FGC § 1850–1861.
[e] The Water Boards do not typically approve establishment of or accept preservation credits.
[f] Programmatic mitigation plans are defined in 23 USC § 169(a) (SHC § 800.9). No more than 25 percent of the funds in the AMA may be allocated for this purpose over a 4-year period [SHC § 800.6(a)(4)].

9.3.1. HCP and/or NCCP Fees

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

Caltrans identified one HCP/NCCP with a plan area that overlaps the GAI and that includes transportation-related projects (Table 4-1, Figure 4-1).

Feasibility. This authorized activity may be feasible. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees

is expected to take 1 to 3 years,[1] at which point the credits or values would be available to transportation projects.

9.3.2. Conservation Bank Credit Purchase

Conservation banks are discussed in Section 4.3. Conservation banks are species-focused, and each bank's alignment with natural resource protection is documented through its BEI. In the GAI, CDFW is a signatory to nine conservation banks, none of which offer least Bell's vireo credits. FWS is a signatory to nine banks, two of which offer coastal California gnatcatcher credits and none of which offer least Bell's vireo credits (Table 4-1).

Conservation bank service areas are shown on Figures 4-2 through 4-7, and the anticipated transportation project impact forecast on species of mitigation need is presented by year on Figures 6-3 and 6-4. When placed side-by-side, it is possible to see that multiple transportation projects may need species of mitigation need credits and which bank's service areas might have them available by 2023/24, when the credits might contribute to transportation project acceleration.

Feasibility. This authorized activity may be feasible. Caltrans District 11 may be able to address some of its coastal California gnatcatcher mitigation needs through credits purchased from conservation banks in the GAI. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years, at which point the credits or values would be available to transportation projects. The Caltrans District will need to approach each bank to confirm the availability of credits and bulk credit purchase terms. Bulk credits purchased through an advance mitigation project might, with FWS approval, be applied to meet future FWS permit conditions on 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.

9.3.3. 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. Six mitigation banks occur in the GAI, all of which provide wetland and/or non-wetland water credits. The Corps is a signatory on all mitigation banks in the GAI (Table 4-1).

Feasibility. This authorized activity may be feasible. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years, at which point the credits or values would be available to

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

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.[2] In-lieu fee mitigation occurs when a permittee provides funds to an in-lieu fee sponsor instead of either completing project-specific mitigation or purchasing credits from a conservation or mitigation bank and offers permittees an in-lieu fee option to satisfy their compensatory mitigation obligations as determined by the applicable regulatory agencies for impacts on aquatic resources authorized under the CWA, Rivers and Harbors Act, ESA, Porter-Cologne Water Quality Control Act, and other applicable laws. Once enough money is received by an in-lieu fee program, it implements wetland, stream, or threatened or endangered species habitat restoration, creation, enhancement, or preservation activities in a watershed or other defined area.[3] The in-lieu fee program's alignment with natural resource protection is documented through its enabling instrument and will be incorporated into future biological opinions on transportation projects.

There are no in-lieu fee programs with service areas that overlap the GAI.

Feasibility. This authorized activity is not currently feasible because there are currently no in-lieu fee programs in the GAI.

9.3.5. MCA Credit Purchase

As discussed in Section 4.5, MCAs are an advance mitigation tool that can be developed when and where an RCIS is approved by CDFW. At this time (July of fiscal year 2023/24), instructions and guidance for establishing MCAs are currently under development by CDFW.[4] However, there are no active or pending RCISs with service areas that overlap the GAI.

Feasibility. At this time (July of fiscal year 2023/24), this authorized activity is not feasible because no MCA credits are available for purchase in the GAI.

9.3.6. Conservation Bank Establishment

Instructions and guidance for establishing conservation banks are available from CDFW[5] and FWS.[6] Conservation banks are species-focused, and each bank's alignment with natural resource protection will be documented through its BEI. CDFW and FWS are

[2] Up-to-date information on approved in-lieu fee programs, including available credits, can be found at: https://ribits.ops.usace.army.mil/ords/f?p=107:47:13453394859366::NO
[3] https://www.fhwa.dot.gov/innovation/everydaycounts/edc-1/pdf/banking_faq.pdf
[4] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[5] https://wildlife.ca.gov/Conservation/Planning/Banking/Templates
[6] https://www.fws.gov/endangered/esa-library/pdf/Conservation_Banking_Guidance.pdf

potential signatories, and there also may be circumstances where the Corps, CCC, 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 D, *Land Cover Types*
- Appendix E, *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 existing habitat for species of mitigation need within the GAI (WILD-1).
- Preserve, enhance, and increase connectivity between blocks of wildlife habitat (WILD-2).
- Support resiliency of the landscape to climate change and sea-level rise (WILD-3).
- Decrease mortality and competition, and protect population health for species of mitigation need (WILD-4).
- Prioritize multi-species and multi-resource benefits (WILD-5).

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

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

9.3.7. Mitigation Bank Establishment

Instructions and guidance for establishing mitigation banks are available from the 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 G, *Aquatic Resource Locations*

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

Mitigation banks are wetland- and waters-focused, and each bank's alignment with natural resource protection is documented through its BEI. The Corps, RWQCB, FWS, CDFW, NMFS, and CCC are potential signatories. In some circumstances, CDFW's participation in a bank would be documented through an MCA.

An understanding of Corps, RWQCB, FWS, CDFW, NMFS, and CCC's 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 and sea-level rise (AR-3).
- Provide multi-resource benefits (AR-4).

[7] https://www.usace.army.mil/Missions/Civil-Works/Regulatory-Program-and-Permits/mitig_info/
[8] https://wildlife.ca.gov/Conservation/Planning/Banking/Templates
[9] Preservation alone is not recognized by the Corps or RWQCB as providing no net loss.

Further, for each objective, Table 8-3 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 discussed above, instructions and guidance for establishing mitigation banks are available from the Corps and CDFW and, hence, establishing credits is feasible. After the Caltrans Director's approval for funding, delivering an advance mitigation project to establish a mitigation bank is expected to take at least 2 to 6 years before the initial credit release, at which point the credits or values would be available to transportation projects. Caltrans may contract or subcontract bank establishment and/or implementation tasks, including site selection.

9.3.8. In-lieu Fee Program Establishment

In-lieu fee programs are wetlands, waters, and/or wildlife oriented and their alignment with natural resource protection will be documented through its enabling instrument. Instructions and guidance for establishing in-lieu fee programs are available from the federal agencies.[10] With respect to wildlife, like the Corps, FWS also follows federal guidance for establishing an in-lieu fee program; however, a supportive regulatory and administrative pathway for CDFW to develop an in-lieu fee program has not been developed.

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 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, RWQCB, and CCC 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

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

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

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

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

To support future transportation project permits, an MCA or, if needed, an RCIS in concert with an MCA, funded through the AMA, would establish CESA and/or Lake and Streambed Alteration Program credits[11] and CDFW would be the signatory. Caltrans may also request other natural resource regulatory agencies to be signatories to the MCA or may 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

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

credits purchased or established through banking and in-lieu fee programs over permittee-responsible mitigation.

Feasibility. At this time (July of fiscal year 2023/24), instructions and guidance for establishing MCAs are under development by CDFW[12] and the RCIS Program is conducting pilot efforts to inform the development of MCA Guidelines and associated agreements. Consequently, at this time, timelines and specifics related to the MCAs are uncertain and scoping and delivering an advance mitigation project within the AMP's timeline needs is unlikely. Caltrans will stay involved to understand how CDFW's pilots are going but, given the nature of the AMP's revolving account, Caltrans has determined that it cannot commit AMA funds to a pilot effort.

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

Wildlife Crossing and Aquatic Corridor Enhancements

As described in Section 4.5 and pointed out above, 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 enhancements made separate from and distinct from specific transportation projects. An MCA for connectivity would be consistent with Caltrans' understanding of natural resource regulatory agency goals and objectives to preserve, enhance, and increase connectivity between blocks of species of mitigation need habitat (WILD-2), support resiliency of the landscape and aquatic resources to climate change and sea-level rise (WILD-3 and AR-3), and provide multi-resource benefits (WILD-5 and AR-4).

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

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

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 the mitigation crediting framework and outputs (temporary versus permanent), cost feasibility, engineering, and delivery timelines. Caltrans will reassess wildlife crossing and aquatic corridor enhancements related to feasibility with respect to the AMA expenditures and mitigation needs covered in this RAMNA once the 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 (July of fiscal year 2023/24), this authorized activity is not feasible. A supportive regulatory and administrative pathway for a natural resource regulatory agency to recognize credits or values outside of existing advance mitigation mechanisms, such as the procedures to establish banks, does not exist. Without an existing regulatory pathway, the time to establish credits or values for this advance mitigation project type is uncertain. Consequently, at this time, scoping and delivering an advance mitigation project within the AMP's timeline needs through this authorized activity is unlikely. Given the nature of the AMP's revolving account, the AMP has determined that Caltrans cannot commit AMA funds to a pilot effort.

9.3.11. Mitigation in Accordance with A Programmatic Mitigation Plan

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

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

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

accounting procedures, funding, monitoring, and the advance mitigation project's closeout terms and conditions.

Feasibility. At this time (July of fiscal year 2023/24), a number of the authorized activities listed in Table 9-3 appear to be feasible (see Tables 9-4 and 9-5). This suggests that addressing a Caltrans SAMNA-estimated need will not require another approach in accordance with SHC § 800.6(a)(4). At this time, management of the AMA does not need to consider limiting any advance mitigation project type to 25 percent of the fund.

9.3.12. Discussion

Caltrans modeled its compensatory mitigation needs in the GAI for fiscal years 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 to establish additional mitigation (Sections 9.3.6 through 9.3.11).

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

Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Pay NCCP and/or HCP fees	Yes	Yes, one HCP/NCCP	Yes, CDFW and FWS	1 to 3 years
Purchase conservation bank credits	Yes, may require instrument amendment	Yes, two FWS-approved banks in GAI with coastal California gnatcatcher credits	No	1 to 3 years
Purchase in-lieu fee credits	No, no species in-lieu fee programs exist in GAI	Not available	Not available	1 to 3 years
Purchase MCA credits	No	Not applicable	Not applicable	Not applicable
Establish conservation bank	Yes	Yes, with CDFW, FWS, NMFS, and CCC	Yes, with CDFW, FWS, NMFS, and CCC	2 to 6 years
Establish in-lieu fee program	Yes	Yes, with FWS, NMFS, and CCC	Yes, with FWS, NMFS, and CCC Potential to align with Corps in-lieu fee program	2 to 8 years
Establish MCA credits or values[b]	Yes, in part; MCA guidelines in progress	Maybe—MCA guidelines in progress	Maybe, CDFW, SWRCB, FWS, NMFS, and CCC Potential for parallel evaluations	Unknown
Establish RCIS and MCA[b]	Yes, in part; RCIS guidelines available; MCA guidelines in progress	Maybe—RCIS guidelines available; MCA guidelines in progress	Maybe, CDFW, SWRCB, FWS, NMFS, and CCC Potential for parallel evaluations	Unknown
Establish mitigation that meets an RCIS objective	No	Not available	Not available	Not available
Establish mitigation in accordance with a programmatic mitigation plan	No	Not available	Not available	Not available

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

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

Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Purchase mitigation bank credits	Yes, with instrument amendment	Yes, three active and three pending Corps banks	Yes, Corps, CDFW, EPA, FWS, NMFS, RWQCB, and CCC	1 to 3 years
Purchase in-lieu fee credits	No	Not available	Not available	Not available
Purchase MCA credits	No	Not available	Not available	Not available
Establish mitigation bank	Yes	Yes, Corps, FWS, and NMFS	Yes, CDFW, CCC, RWQCB, Corps, EPA, FWS, and NMFS	2 to 8 years
Establish in-lieu fee program	Yes	Yes, for Corps, EPA, FWS, and NMFS	Maybe, Corps, FWS, NMFS, EPA, CDFW, and RWQCB	2 to 8 years
Establish MCA credits or values[b]	Yes, in part; MCA guidelines in progress	Maybe—MCA guidelines in progress	Maybe, CDFW, CCC, RWQCB, and NMFS Potential for parallel evaluation(s)	Unknown
Establish RCIS and MCA[b]	Yes, in part; RCIS guidelines available; MCA guidelines in progress	Maybe—RCIS guidelines available; MCA guidelines in progress	Maybe, CDFW, CCC, RWQCB, and NMFS Potential for parallel evaluation(s)	Unknown
Establish mitigation that meets an RCIS objective	No	Not available	Not available	Not available
Establish mitigation in accordance with a programmatic mitigation plan	No	Not available	Not available	Not available

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

Based on its evaluation, Caltrans found that, at this time (July of fiscal year 2023/24), 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 11 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 11 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 requesting that others 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 11 will use information within the RAMNA. Each scope will consider mitigation needs; the timing of mitigation needs; conservation data and plans; input from natural resource regulatory agencies, interested parties, and tribes; feasibility; timing; and other financial, strategic, and technical risks associated with transportation project delivery and conservation actions. Advance mitigation project scopes will also employ, as appropriate, existing applicable state and federal standards and instruments, mitigation-related agreements, advance mitigation project-specific agreements, and contracts with qualified third parties.

Caltrans District 11 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 11 will commit to delivering the advance mitigation project within the scope, schedule, and budget communicated with nomination materials. At that point, Caltrans District 11 will initiate project delivery (see Steps 6 through 10 on Figure 1-2; Caltrans 2021b). Advance mitigation project delivery includes stakeholder

engagement, project alternatives 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 will 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 such as 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-8s to be consistent with the 2008 Mitigation Rule and ecoregions to be consistent with the SWAP.

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

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