ADVANCE MITIGATION PROGRAM
Mojave Desert Ecoregion Section
Regional Advance Mitigation Needs Assessment

Version 1.0

Establishing Caltrans' Need for Advance Mitigation
for the Mojave Desert Section,
forecast fiscal years 2017/2018 to 2026/2027

California Department of Transportation – District 8
with support from District 9, District 7

August 2020

This page is intentionally left blank.

TABLE OF CONTENTS

APPENDICES

TABLES

FIGURES

LIST OF ACRONYMS

Acronym	Definition
ACE	Areas of Conservation Emphasis
AMA	Advance Mitigation Account
AMP	Advance Mitigation Program
Basin Plan	Water Quality Control Plan
BEI	Bank Enabling Instrument
BLM	Bureau of Land Management
Cal-IPC	California Invasive Plant Council
Caltrans	California Department of Transportation
CDFW	California Department of Fish and Wildlife
CEHC	California Essential Habitat Connectivity Project
CEQA	California Environmental Quality Act
CESA	California Endangered Species Act
CFR	Code of Federal Regulations
CNRA	California Natural Resources Agency
CO_2	carbon dioxide
Corps	U.S. Army Corps of Engineers
CTC	California Transportation Commission
CWA	Clean Water Act
CWHR	California Wildlife Habitat Relationships
desert tortoise	Mojave Desert tortoise
District	Caltrans District 8
DRECP	Desert Renewable Energy Conservation Plan
EA	expenditure authorization
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FGC	California Fish and Game Code
FWS	U.S. Fish and Wildlife Service
GAI	geographic area of interest
GAP	Gap Analysis Program
GIS	geographic information system
HCP	habitat conservation plan
HU	hydrologic unit
HUC	hydrologic unit code
MCA	mitigation credit agreement
MPO	metropolitan planning organization

NCCP	natural community conservation plan
NEPA	National Environmental Policy Act
NPS	National Park Service
RAMNA	Regional Advance Mitigation Needs Assessment
RCIS	Regional Conservation Investment Strategy
resource and regulatory agencies	natural resource regulatory agencies
RTPA	regional transportation planning agency
RWQCB	Regional Water Quality Control Board
SAMNA	Statewide Advance Mitigation Needs Assessment
SHC	Streets and Highways Code
SHOPP	State Highway Operation and Protection Program
State Water Board	State Water Resources Control Board
STIP	State Transportation Improvement Program
SWAP	State Wildlife Action Plan
UC	University of California
USC	U.S. Code
USDA	U.S. Department of Agriculture
USFS	U.S. Forest Service
USGS	U.S. Geological Survey
WOTUS	waters of the U.S.

EXECUTIVE SUMMARY

In 2017, the California Streets and Highways Code ("SHC") § 800 et seq. was amended to create the Advance Mitigation Program ("AMP") within the California Department of Transportation ("Caltrans") and to provide the seed capital for an Advance Mitigation Account ("AMA"), to be operated by Caltrans as a revolving account. The intent of the legislation is 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 mitigation. 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. Generally speaking, the 11 allowable expenditures consist of purchasing or establishing mitigation credits (or similar).

Caltrans implements the AMP in accordance with a process described in the *Advance Mitigation Program Final Formal Guidelines* (Caltrans 2019a). At this time, only Step 1 and Step 2 of the AMP's five-step advance mitigation planning phase are complete and the *Mojave Desert Ecoregion Section Regional Advance Mitigation Needs Assessment* ("RAMNA") provided herein is intended to satisfy Step 3 (Figure ES-1; Caltrans 2019a). The Statewide Advance Mitigation Needs Assessment ("SAMNA") was conducted and utilized, in coordination with local knowledge, to select the Mojave Desert Ecoregion Section as the Geographic Area of Interest ("GAI") to be evaluated further with respect to anticipated future mitigation needs, satisfying Step 1 and Step 2. Now, within this RAMNA, in coordination with natural resource regulatory agencies, Caltrans defines and explores the feasibility of various options for purchasing or establishing mitigation credits (or similar) in the GAI, in accordance with the 11 authorized activities identified by SHC § 800.6(a). Next, in Step 4, Caltrans District 8 will nominate a specific advance mitigation project to the Caltrans Director and request funding approval. The advance mitigation planning phase will conclude when the Caltrans Director approves a specific advance mitigation project for funding (Step 5; Caltrans 2019a). Advance mitigation project delivery is a different process undertaken after an advance mitigation project has been approved by the Caltrans Director, and meant to benefit from, advance mitigation planning (Caltrans 2019a; see Figure 1-2). (Caltrans 2019a).

Figure ES-1. Advance Mitigation Planning Phase (Caltrans 2019a)

Advance mitigation project scopes informed by this RAMNA will provide enough information, at the appropriate level of detail, for the Caltrans Director to approve the project for funding. A planning-level document, this RAMNA:

- is a desktop analysis of relevant available information;
- covers fiscal years 2018 to 2027, a specific planning period, concurrent with the time period addressed by the *State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2017/18–2026/27* ("SHOPP Ten-Year Book") (Caltrans 2018a);
- applies to potential compensatory mitigation conditions that may be placed on future transportation projects by the seven natural resource regulatory agency signatories[1] 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 the GAI, an area with wildlife habitats and aquatic resources[2] that has a high probability of requiring transportation project mitigation between 2018 and 2027—the Mojave Desert Ecoregion Section, predominantly within Caltrans District 8 (Figure ES-2);
- documents Caltrans' forecast of its potential wildlife and aquatic resource compensatory mitigation needs for GAI and planning period, as reported by the *Statewide Advance Mitigation Needs Assessment Report*, *State Highway Operation and Protection Program, Ten-Year Project Book, Second Quarter 2017/2018 Fiscal Year* (Caltrans 2019b);
- 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 mitigation supply;
- incorporates information and feedback received from outreach to 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; and
- analyzes Caltrans' options to meet its mitigation needs in the GAI through the AMP's authorized activities in accordance with SHC § 800.6(a).

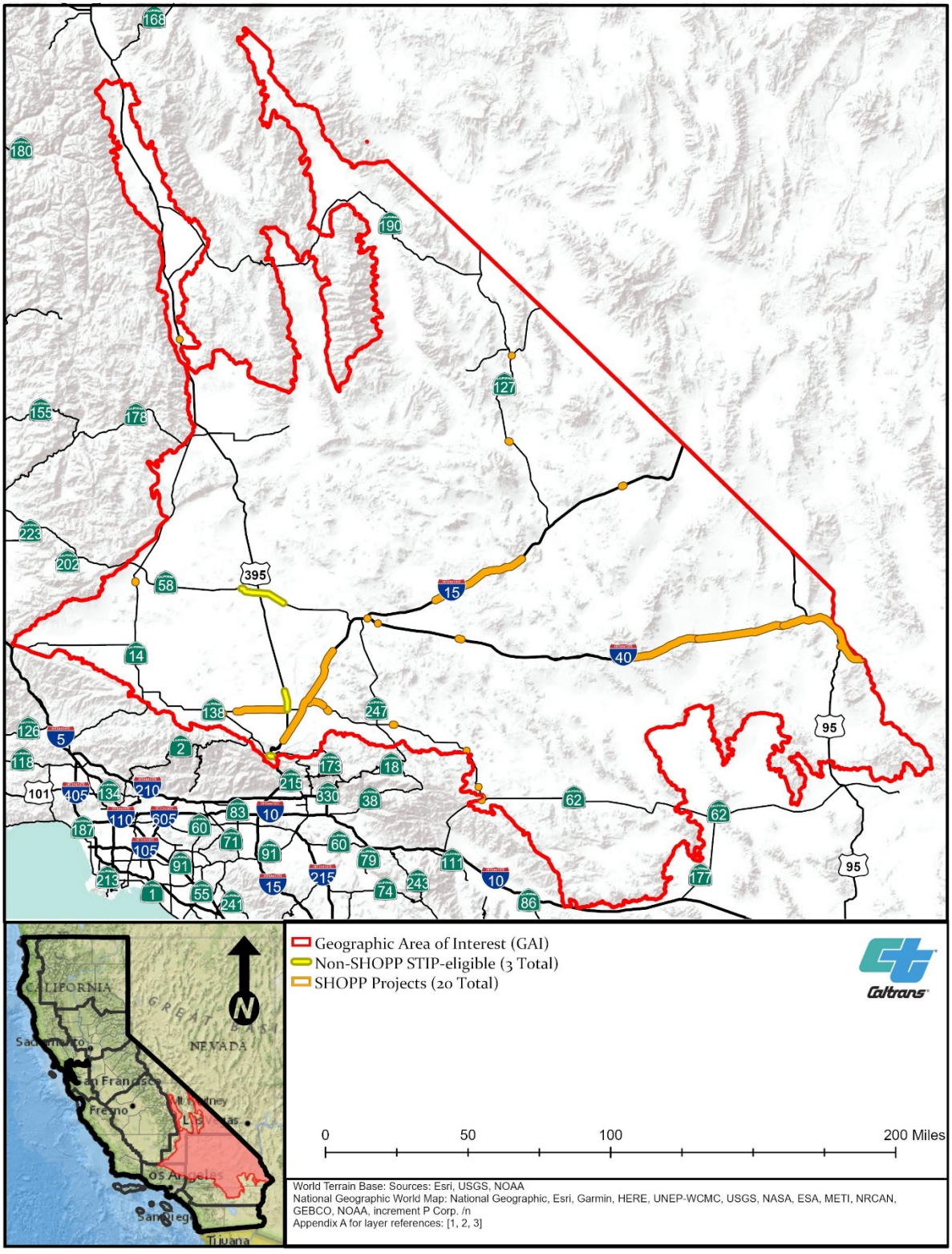
A brief description of each section is provided below.

---

[1] Natural resource regulatory agency signatories are California Department of Fish and Wildlife ("CDFW"); California State Water Resources Control Board ("State Water Board"); U.S. Army Corps of Engineers ("Corps") Los Angeles District, Sacramento District, and San Francisco District; U.S. Environmental Protection Agency ("EPA"), U.S. Fish and Wildlife Service ("FWS"); National Marine Fisheries Service ("NMFS"); and California State Coastal Commission.

[2] For the purposes of this document, aquatic resources include all wetlands and waters regulated by CDFW, the State Water Resources Control Board and the Regional Water Quality Control Boards ("Water Boards"), Corps, and EPA.

Figure ES-1. Road Infrastructure within the Mojave Desert Ecoregion Section



ES.1 Geographic Area of Interest and Resource Focus

GAIs are established at a watershed or ecoregion scale to assist with appropriate planning areas for mitigation implementation and anticipated use areas that align with natural resource regulatory agency practices (Caltrans 2019a). Caltrans District 8, in communication with other transportation agencies, selected the Mojave Desert Ecoregion Section as the GAI (Figure ES-2) because SAMNA results indicate that investing program funds to implement landscape-scale mitigation in this area 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.

Caltrans District 8 also identified compensatory mitigation for wildlife resources in the GAI as both a historical transportation project compensatory mitigation need, and an anticipated future transportation project compensatory mitigation need. Because the SAMNA forecasts impact on hundreds of species' habitats, to further focus the planning effort, Caltrans District 8 selected the Mojave desert tortoise (*Gopherus agassizii*); ("desert tortoise") as a species of mitigation need. Other state and federal special-status species occur in the GAI, and Caltrans intends for conservation benefits and values to be realized for other special-status species through the implementation of advance mitigation centered on the species of mitigation need identified in the GAI, given their reliance on similar habitats.

For the purposes of this document, aquatic resources include all wetlands and waters[3] regulated by CDFW, the State Water Board and the Regional Water Quality Control Boards ("Water Boards"), Corps, and EPA. Caltrans District 8 identified two hydrological unit code ("HUC") sub-basins within which aquatic resources impacts are anticipated to be co-located with desert tortoise habitat: the Mojave sub-basin (HUC 18090208) and the Southern Mojave sub-basin (HUC 18100100). Caltrans intends for conservation benefits and values to be realized for aquatic resources through the implementation of advance mitigation centered on the species of mitigation need identified in the GAI, as well.

Focusing this analysis improves the probability that advance mitigation projects undertaken by Caltrans will yield mitigation 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.

ES.2 Environmental Setting

The GAI coincides with the approximately 16.5-million-acre portion of the Mojave Desert Ecoregion Section located in California. Caltrans District 8 predominantly overlaps the GAI; however small portions of Caltrans District 7 and District 9 overlap the GAI, as well.

[3] It should be noted that "waters" is a general term that can apply to waters of the United States, waters of the state, or both.

Geospatial data from the SAMNA Reporting Tool, CDFW's BIOS, and other readily available information are summarized and presented in this RAMNA. Climate change resiliency, wildlife connectivity, biodiversity, and conserved lands are among the information presented. Additional information on the environmental setting of the GAI is provided in Chapter 2.

ES.3 Relevant Plans, Policies, and Regulations

Compensatory mitigation is informed by regulatory requirements, regulatory pathways 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 97 relevant documents for the RAMNA: 23 laws and regulations, 12 statewide and regional resource planning documents, 8 plans and permits focused on desert tortoise, 1 resource agency land management plan, 26 federal and state land management plans, 1 water resources plan, 3 local government land use plans, 17 County and City general plans, and 5 nongovernmental organization conservation and management documents. A summary and links to all of these documents can be found in Chapter 3.

ES.4 Existing Mitigation Opportunities

SHC § 800.6(a) authorizes Caltrans to use AMA funds for purchasing compensatory mitigation that has been previously approved by the natural resource regulatory agencies through a conservation bank, mitigation bank, habitat conservation plan ("HCP"), natural community conservation plan ("NCCP"), in-lieu fee program, or mitigation credit agreement ("MCA") developed in accordance with a CDFW-approved regional conservation investment strategy ("RCIS"). In the GAI, Caltrans identified 2 HCPs, 2 HCP/NCCPs (one is pending), 9 conservation or mitigation banks, one in-lieu fee program, and no MCAs (although a draft Antelope Valley RCIS has been submitted). 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[4] and may be suitable for concurrent transportation project mitigation. Chapter 4 provides a more in-depth discussion of existing mitigation opportunities in the GAI.

ES.5 Estimated Impacts

Caltrans undertakes SHOPP transportation projects to address the maintenance, safety, operation, and rehabilitation of the state highway system, which do not add new capacity to the system.[5] Metropolitan planning organizations, regional transportation planning

[4] 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.

[5] https://catc.ca.gov/programs/state-highway-operation-and-protection-program

agencies, and other public agencies also undertake transportation projects, to address non-SHOPP STIP-funded transportation improvements. Since the SHOPP Ten-Year Book is an early planning document, Caltrans must rely on modeling future impacts through the SAMNA, as well as qualitative assessments of STIP-eligible needs, to define the range of advance mitigation needs, prior to developing a focused advance mitigation project scope to address anticipated needs.

For special-status terrestrial plant and wildlife species, potential impacts from 20 SHOPP and 3 STIP eligible transportation projects in their planning and conceptual phases for desert tortoise habitat in the GAI are presented and discussed in the RAMNA. For fiscal years 2018 to 2027, the following impacts were identified:

- The SAMNA analyses determined that
    - 17 SHOPP transportation projects could potentially impact 9 habitat types, potentially affecting 534.7 acres of desert tortoise habitat in total (Table ES-1).
    - 64 co-occurring special status species have the potential to co-occur with desert tortoise (Table ES-1).
- Since they are near planned SHOPP transportation projects planned in the Southern Mojave Sub-basin, additional mitigation need may be expected from the 3 STIP-eligible transportation projects.

As pointed out above in ES.1, the desert tortoise was identified as a species of mitigation need to focus this assessment towards mitigation likely to be needed by future transportation projects. Nevertheless, another 64 state and federal special-status species occur in the GAI. Caltrans intends for conservation benefits and values to be realized for other special-status species through the implementation of advance mitigation projects centered on the species of mitigation need identified in the GAI, given their reliance on similar habitats.

Table ES-1 provides these data in tabular format for ease of reference. Please refer to Chapter 5 for additional information regarding wildlife-related impacts analyzed in this RAMNA.

Table ES-1. Summary of Estimated SHOPP Wildlife Resource Impacts

GAI Wildlife Resource	Number of Caltrans SHOPP Projects	Number of Special-status Species Habitats	Number of Special-status Species	Estimated Impact (acres)
Desert tortoise habitat[a]	17	9	64[b]	534.7

[a] "Species of mitigation need" were identified for this RAMNA to help focus this effort. Species of mitigation need are species for which Caltrans anticipates a high probability of mitigation need.
[b] Number of special status species that potentially co-occur with desert tortoise.

For aquatic resources, potential impacts from 10 SHOPP and 3 STIP eligible transportation projects in their planning and conceptual phases in the Mojave sub-basin and the Southern Mojave sub-basin are presented and discussed in the RAMNA. For fiscal years 2018 to 2027, the following impacts were identified:

- The SAMNA analyses determined that,
  - none of the planned transportation projects would result in impacts on special-status fish habitat.
  - one (1) of the planned transportation projects could potentially impact 0.07 acres of wetlands (Table ES-2).
  - Ten (10) of the planned transportation projects could potentially impact 11.59 acres of waters (Table ES-2).
- Since they are near planned SHOPP transportation projects planned in the Southern Mojave Sub-basin, additional mitigation need may be expected from the 3 STIP-eligible transportation projects.

It should be noted that “waters” is a general term that can apply to waters of the United States (WOTUS), waters of the state, or both. These data are provided in Table ES-2 in tabular format for ease of reference. Please refer to Chapter 5 for additional information regarding aquatic resources impacts analyzed in this RAMNA.

Table ES-2. Summary of Estimated SHOPP Aquatic Resource Impacts

GAI Sub-basin (HUC-8)[a]	Number of Transportation Projects, Wetlands (HUC-8)	Total Estimated Wetland Impacts (acres)	Number of Transportation Projects, Waters (HUC-8)	Total Estimated Water Impacts (acres)
Mojave Sub-basin	1	0.07	8	3.68
Southern Mojave Sub-basin	0	0	6	7.91
Aquatic resources, total counts	**1[b]**	**0.07**	**10[b]**	**11.59**

[a] Sub-basin is contained completely within the GAI.
[b] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects cross more than one HUC-8.

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 2020/2021), Caltrans is 3 years into the SHOPP Ten-Year Book planning period. Hence, for the time period under consideration, 2017/2018 to 2026/2027, the District intends to prioritize purchasing or developing mitigation credits or values that would support the Road Repair and Accountability Act of 2017 priorities, which generally fall in the middle and end of the 10-year assessment period. Given the expected timing of mitigation need, at this time (July of fiscal year 2020/2021) credits or values that can be

purchased or established by 2023/2024 (within the next 2 years) could address a subset of the impacts described above, approximately:

- 250 acres of desert tortoise habitat mitigation need, potentially contributing to the acceleration of 10 of transportation projects.
- 0.7 acres of wetland mitigation need, potentially contributing to the acceleration of one transportation project.
- 2 acres of waters mitigation need, potentially contributing to the acceleration of 8 transportation projects.

All or some of these needs could form the basis for Caltrans District 8 to develop an advance mitigation project scope.

ES.7 Wildlife Resources Conservation Goals and Objectives

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

When establishing wildlife resources 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 resource and regulatory agencies that have the authority to approve wildlife resource-related credit establishment, and have 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 encompass 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 herein summarize how state and federal resource and regulatory agencies, and other land-managing 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 desert tortoise in the GAI; however, advance mitigation for the benefit of the aforementioned species is anticipated to have broader benefits for multiple special-status species that rely on the same habitats. Caltrans' understanding of resource agency wildlife goals gathered for this RAMNA include:

- Conserve and expand existing desert tortoise habitat (WILD-1).
- Preserve, enhance, and increase connectivity between blocks of desert tortoise habitat (WILD-2).
- Support resiliency of the landscape to climate change (WILD-3).
- Decrease desert tortoise mortality (WILD-4).
- Prioritize providing multi-species benefits (WILD-5).

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.

ES.8 Aquatic Resources Goals and Objectives

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

When establishing aquatic resources 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 encompass restoring, maintaining, and enhancing large-scale ecological processes, environmental gradients, biological diversity, and regional linkages. In recognition of transportation project acceleration needs, wildlife goals and objectives place an emphasis on desert tortoise habitat in the GAI; however, in some cases, advance mitigation for the benefit of the aforementioned species has the potential to benefit aquatic resources, as well. Aquatic resources goals developed for this RAMNA prioritize:

- Achieve no net loss of area, function, and value of aquatic resources, including waters of the United States and waters of the state (AR-1). Note that preservation alone is not recognized by the Corps or Water Boards as providing no net loss.
- Restore and maintain the chemical, physical, and biological integrity of waters (AR-2)
- Support resiliency of aquatic resources to climate change (AR-3).
- Prioritize providing multi-resource benefits, including waters (AR-4).

Sub-objectives are included for each goal 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-9 Authorized Activity Summary

Broadly speaking, the 11 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 District 8 will consider all feasible options when developing advance mitigation project scopes that could meet its mitigation needs. The feasibility of each authorized activity to meet the forecast mitigation need in time to accelerate transportation projects will depend on the availably of a regulatory and administrative pathway and other conditions. When establishing mitigation credits, Caltrans intends to scope projects that align with conservation goals and objectives, address multi-resource benefits, and address overlapping jurisdictions.

Caltrans District 8 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, Caltrans District 8 will begin advance mitigation project delivery, which includes further scoping, stakeholder engagement, project alternative analysis, coordination with resource agency partners, and, finally, implementation.

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

1. INTRODUCTION

In 2017, the California Streets and Highways Code ("SHC") § 800 et seq. was amended to create the Advance Mitigation Program ("AMP") within the California Department of Transportation ("Caltrans") and to provide the seed capital for an Advance Mitigation Account ("AMA"), to be operated by Caltrans as a revolving account. The intent of the legislation is 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 mitigation. 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. Generally speaking, the 11 allowable expenditures consist of purchasing or establishing mitigation credits (or similar).

Approved at the end of 2019, the *Advance Mitigation Program Final Formal Guidelines* ("AMP Guidelines") describe how through advance mitigation project scoping and advance mitigation project delivery, Caltrans AMP will fulfill its intended purpose (Figures 1-1 and 1-2, located at the end of this section; Caltrans 2019a). 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.

At this time, only Step 1 and Step 2 of the AMP's five-step advance mitigation planning phase are complete and the *Mojave Desert Ecoregion Section Regional Advance Mitigation Needs Assessment* ("RAMNA") provided herein is intended to satisfy Step 3 (Figure 1-1; Caltrans 2019a). The Statewide Advance Mitigation Needs Assessment ("SAMNA") was conducted and utilized, in coordination with local knowledge, to select the Mojave Desert Ecoregion Section as the Geographic Area of Interest ("GAI") to be evaluated further with respect to anticipated future mitigation needs, satisfying Step 1 and Step 2. Caltrans District 8 predominantly overlaps the GAI; however, small portions of Caltrans District 7 and District 9 also overlap the GAI (Figure 1-3). Now, within this RAMNA, in coordination with natural resource regulatory agencies, Caltrans defines and explores the feasibility of various options for purchasing or establishing mitigation credits (or similar) in the GAI, in accordance with the 11 authorized activities identified by SHC § 800.6(a). Next, in Step 4, Caltrans District 8 will nominate a specific advance mitigation project to the Caltrans Director and request funding approval. The advance mitigation planning phase will conclude when the Caltrans Director approves a specific advance mitigation project for funding (Step 5; Caltrans 2019a).

Advance mitigation project scopes informed by this RAMNA will provide enough information, at the appropriate level of detail, for the Caltrans Director to approve the project for funding. This RAMNA is a planning-level document that:

- Provides a desktop analysis of relevant available information pertaining to the Mojave Desert Ecoregion Section, which is referred to as the GAI hereafter;

- Applies to fiscal years 2018 to 2027 (planning period), which is concurrent with the time period addressed by the *State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2017/18–2026/27* ("SHOPP Ten-Year Book") (Caltrans 2018a);
- Discusses potential compensatory mitigation conditions that may be placed on future transportation projects by the seven resource and regulatory agency signatories[1] 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[2] compensatory mitigation needs for the GAI and planning period, as reported by the *Statewide Advance Mitigation Needs Assessment Report*, *State Highway Operation and Protection Program, Ten-Year Project Book, Second Quarter 2017/2018 Fiscal Year* ("SAMNA") (Caltrans 2019b);
- 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 resource and regulatory agencies, the Federal Highway Administration, metropolitan planning organizations, regional transportation planning agencies, 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.

Advance mitigation project delivery is a different process undertaken after an advance mitigation project has been approved by the Caltrans Director, and meant to benefit from, advance mitigation planning (Caltrans 2019a; see Figure 1-2).

Caltrans District 8 will first use the information and analysis presented in this RAMNA to inform Step 4 of the advance mitigation planning process (Figure 1-1). Step 4 is the point in the advance mitigation planning process when Caltrans justifies, proposes, and scopes

[1] Resource and regulatory signatories are California Department of Fish and Wildlife ("CDFW"); California State Water Resources Control Board ("State Water Board"); U.S. Army Corps of Engineers ("Corps") Los Angeles District, Sacramento District, and San Francisco District; U.S. Environmental Protection Agency ("EPA"), U.S. Fish and Wildlife Service ("FWS"); National Marine Fisheries Service ("NMFS"); and California State Coastal Commission.

[2] For the purposes of this document, aquatic resources include all wetlands and waters regulated by CDFW, Regional Water Quality Control Boards ("RWQCBs"), Corps, and EPA.

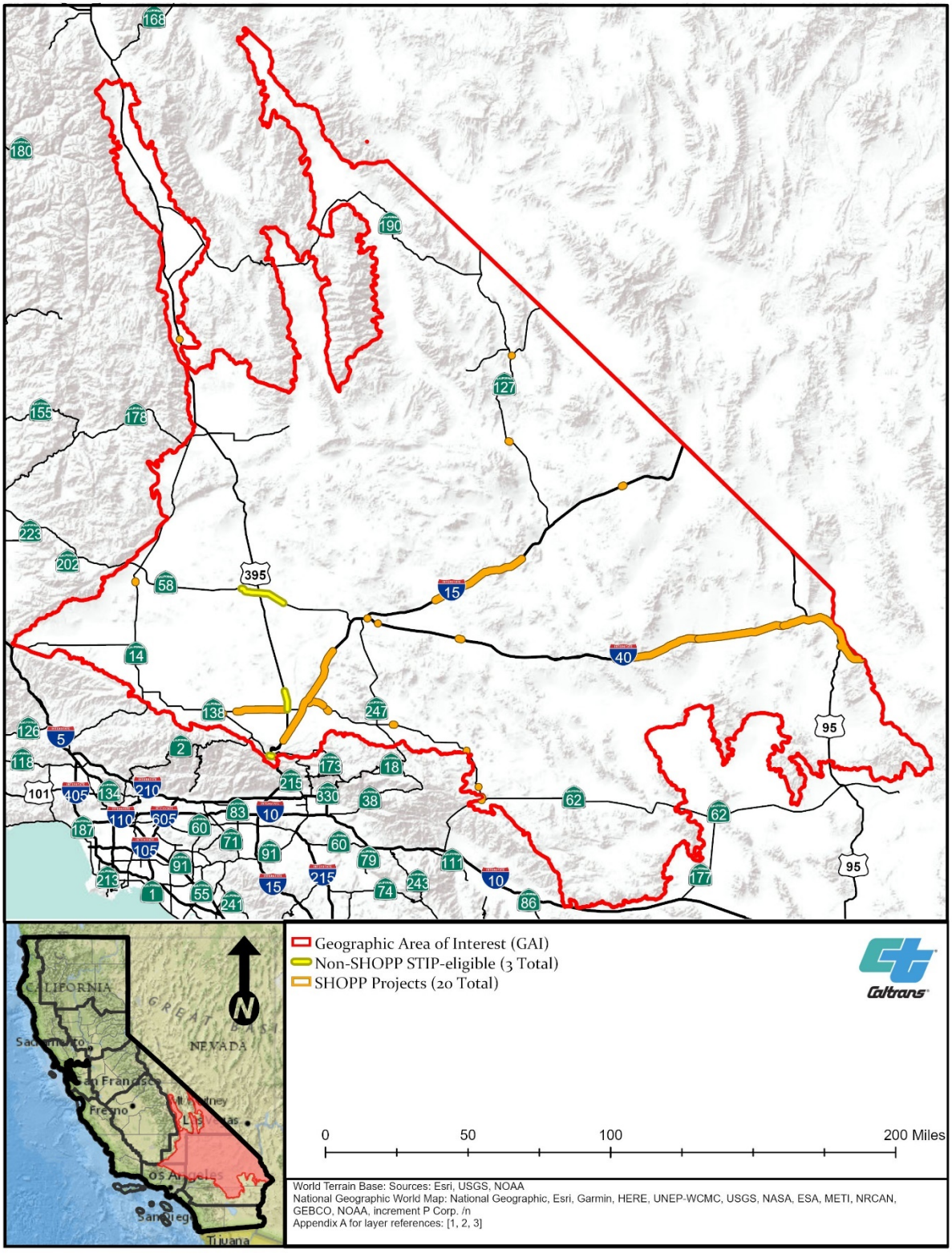
an advance mitigation project (Caltrans 2019a). Thereafter, Caltrans District 8 will use the RAMNA as a reference (Caltrans 2019a).

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 the Federal Highway Administration, resource and 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 develops advance mitigation project scopes and approves funding (Caltrans 2019a).

Figure 1-1. Advance Mitigation Planning Phase (Caltrans 2019a)

Figure 1-2. Advance Mitigation Project Delivery Phase (Caltrans 2019a)

Figure 1-3. District 8 Road Infrastructure



1.1 AMP Overview

As pointed out above, the AMP Guidelines describe how, through advance mitigation planning and advance mitigation project delivery, Caltrans AMP will fulfill its intended purpose (Caltrans 2019a). It presents a 10-step process, the first five of which are the advance mitigation planning phase and the second five of which are the advance mitigation project delivery phase (Figure 1-1 and Figure 1-2).

Advance mitigation planning starts with modeled estimates of potential impacts on more than 600 wildlife and aquatic resources and through successive steps focuses and refines Caltrans need for advance mitigation, in order to inform advance mitigation scopes that will be approved by the Caltrans Director (Figure 1-1). Advance mitigation project delivery consists of implementing the authorized activities under SHC § 800.6(a), which are primarily existing procedures or procedures under development (Figure 1-2). Implementation of each step of the process serves to improve the probability that advance mitigation projects undertaken by Caltrans will yield credits (or similar) that will be comply with an appropriate established regulatory framework and be approved by the requisite resource and regulatory agencies.

Implicit to the AMP Guidelines, advance mitigation planning, advance mitigation project delivery, and this document are the following:

- Gas tax derived funds may be used only to develop compensatory mitigation credits (or similar) anticipated to be needed to fulfill the resource and regulatory agency mitigation requirements on transportation projects and improvements [Cal. Const., art. XIX, § 2, subd. (a)].
- AMA funds are not large enough 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 the resource and regulatory agencies, or that the advance mitigation project will be considered adequate and/or suitable by the resource and regulatory agencies for a specific transportation project's impact.
- Advance mitigation projects should optimize their conservation benefit in such a way that the number and types of compensatory mitigation credits (or similar) are maximized.
- Advance mitigation projects, like transportation projects and conservation projects, have financial, technical, and strategic risks; as well as a scope, schedule, and budget.

- Transportation project budget estimates benefit when compensatory mitigation credits (or similar) are available, since compensatory mitigation credits have a defined price and market value.
- The appropriateness of the use of compensatory mitigation credits (or similar) will be determined on a case-by-case basis as part of each future transportation project's permitting and technical assistance processes.
- Transportation projects must still go through environmental and permitting processes, and must demonstrate avoidance and minimization efforts prior to compensation.
- Transportation projects must include compensatory mitigation costs in the scoping and programming of their budgets, because they are required by law to reimburse the AMA for use of compensatory mitigation produced by the AMP [SHC § 800.6(b)].

This list is not presented in any order or priority.

1.2 District 8 Transportation Infrastructure

Caltrans District 8 is headquartered in San Bernardino. District 8 is the largest of the 12 statewide Caltrans Districts, and covers approximately 28,650 square miles of land within San Bernardino and Riverside counties. Four interstate highways and 32 state routes totaling 7,200 lane miles are within the District's boundaries (Figure 1-3).

The Inland Empire area is experiencing continued growth. Commercial distribution centers are rapidly growing along the Ontario/Interstate 15 corridor, bringing not only additional jobs but increased truck traffic. Given the high volume of large vehicles, truck lanes are becoming a necessity on major routes. High-wind areas are also prevalent on all four of the interstates. Wind gusts, especially on Interstate 10 in the Palm Springs area and on Interstate 15 in the Cajon Pass, frequently cause high-profile vehicles to be diverted or stopped from using these highways when gusts reach 55 miles per hour.

Interstate 15 experiences heavy congestion because of tourist travel to and from Nevada, and the transport of commodities coming from Mexico and San Diego. Furthermore, year-round recreation in the San Bernardino Mountains requires that the highways be open and clear of snow daily, which is a priority for Caltrans maintenance employees.

Other transportation agencies that implement transportation improvements eligible for STIP funding (MPOs, RTPAs, and other public agencies) within Caltrans District 8's boundaries are San Bernardino County Transportation Authority and San Bernardino County.

1.3 SAMNA

Predicting likely future transportation project impacts on natural resources takes place at the intersection of transportation planning and conservation planning. In 2018, consistent with Step 1 of the advance mitigation planning process (Figure 1-1), the AMP forecast Caltrans statewide compensatory mitigation needs for the transportation projects

conceptualized in the SHOPP Ten-Year Book for fiscal years 2018 to 2027 ("planning period", Caltrans 2018a, Caltrans 2019b). The forecast was performed using the Caltrans Statewide Advance Mitigation Needs Assessment Reporting Tool ("SAMNA Reporting Tool"), a GIS overlay model developed by Caltrans to support advance mitigation planning (Caltrans 2019b). Potential impacts for all 12 Caltrans Districts were estimated. Statewide, over 900 transportation projects and over 600 wildlife and aquatic resources were evaluated through the SAMNA Reporting Tool, yielding thousands of results (Caltrans 2019b). Caltrans District 8 results are provided on pages 241 through 244 of Caltrans 2019b. Since the GAI slightly overlaps two other Caltrans districts, Caltrans District 7 results are provided on page 216 and Caltrans District 9 results are provided on page 266.

For consistency and as appropriate, tables, figures, and information presented throughout this document, including Chapter 2, Environmental Setting, are consistent with the geospatial data provided by the SAMNA Reporting Tool. SAMNA Reporting Tool geospatial data and model assumptions are described more fully in Caltrans 2019b. Results are presented in four different reports: terrestrial and aquatic species and sub-species, special-status fish, waters, and wetlands. The unit of measure for impacts is acres.

SAMNA Caveats: The SAMNA is strictly and specifically intended to be used for Caltrans to justify, propose, and scope advance mitigation projects (Caltrans 2019b). The SAMNA results:

- Are not to be used as a substitute for or to 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 transportation project planners from first avoiding and then minimizing impacts on sensitive natural resources.
- Do not preclude the necessity of compliance with CEQA, NEPA, and/or local, state, and federal regulations and policies.
- 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.

1.4 GAI

Due to quantity of resources evaluated through the SAMNA, limited AMA funding, and need for the AMP to revolve the account, Caltrans focused on a GAI with wildlife habitats

and aquatic resources that have a high probability of requiring transportation project-related compensatory mitigation. Consistent with Step 2 of the advance mitigation planning process (Figure 1-1), in 2019, Caltrans District 8 subject matter specialists:

- Reviewed the entirety of District 8's SAMNA results and their associated future transportation project locations and activities anticipated for SHOPP;
- Reviewed non-SHOPP STIP-eligible transportation improvement plans for the next 10 years; and
- Defined the GAI based on where Caltrans and other public agencies that implement transportation improvements could benefit from advance mitigation.

In addition, compensatory mitigation for wildlife resources in the GAI were specifically identified by Caltrans District 8 as both:

- A historical transportation project compensatory mitigation need, and
- An anticipated future transportation project compensatory mitigation need in District 8.

Hence, to further focus the advance mitigation planning effort, species of mitigation need and watersheds, within which aquatic resources impacts are anticipated, were also identified:

- The Mojave desert tortoise (*Gopherus agassizii*; "desert tortoise") was identified as the species of mitigation need. This species is federally and stated listed as threatened, and a candidate for state listing as endangered.
- Two HUC-8 sub-basins, the Mojave River (hydrological unit code ["HUC"] 18090208) and the Southern Mojave sub-basin (HUC 18100100), are anticipated to have aquatic resource impacts, coincident with desert tortoise impacts.

Focusing this planning-level assessment improves the probability that advance mitigation projects eventually undertaken and delivered 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 actions to support the natural resources in the GAI to benefit other sensitive resources as well.

1.5 Regulatory Framework Summary

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

- California Environmental Quality Act ("CEQA") (Public Resources Code § 21000 et seq.)
- National Environmental Policy Act ("NEPA") (42 U.S. Code ["USC"] § 4321 et seq.)
- Federal Endangered Species Act of 1973 ("ESA") (16 USC § 1531–1543), as amended
- California Endangered Species Act ("CESA") (FGC § 2050 et seq.)
- Federal Clean Water Act ("CWA"), Sections 401 and 404 (33 USC § 1251–1376)
- Porter-Cologne Water Quality Control Act (California Water Code § 13000 et seq.)

- FGC § 1600 et seq.

Resource and regulatory agencies that may need to be engaged for transportation projects that impact natural resources in the GAI are listed in Table 1-1.

Table 1-1. Resource Agencies with Jurisdiction Over Natural Resources in the GAI

Partner	Web Address
CDFW, Central, South Coast, and Inland Desert Regions	https://wildlife.ca.gov/Regions/4 https://wildlife.ca.gov/Regions/5 https://wildlife.ca.gov/Regions/6
California Regional Water Quality Control Board ("RWQCB") Colorado River, Lahontan, Los Angeles, and Santa Ana regions	https://www.waterboards.ca.gov/coloradoriver/ https://www.waterboards.ca.gov/lahontan/ https://www.waterboards.ca.gov/losangeles/ https://www.waterboards.ca.gov/santaana/
State Water Resources Control Board ("State Water Board")	https://www.waterboards.ca.gov/
U.S. Army Corps of Engineers ("Corps"), South Pacific Division, Los Angeles District	http://www.spl.usace.army.mil/
U.S. Environmental Protection Agency ("EPA"), Region 9	http://www.epa.gov/region9/
U.S. Fish and Wildlife Service ("FWS"), Sacramento Field Office	https://www.fws.gov/sacramento/

Each of the resource and regulatory agencies listed in Table 1-1 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.
- Recognize the use or application of compensatory mitigation that was established through an instrument or other formal inter-agency 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 resource and regulatory agencies also have procedures for establishing compensatory mitigation as defined by regulations, policies and guidelines including, but not limited to:

- FGC § 1797 et seq.
- FGC § 1856

- 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)
- *Final Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division* (Corps 2015)
- *Memorandum of Understanding Concerning Mitigation and Conservation Banking and In-Lieu Fee Programs in California* [California Natural Resources Agency ("CNRA") et al. 2011].
- Regulatory In-Lieu Fee and Bank Information Tracking System website (Corps 2020)

Credits are the usual currency of compensatory mitigation established through an advance mitigation project; however, other values may be established. Establishing conservation banks, mitigation banks,[3] and in-lieu fee programs requires an instrument. Existing policies and regulations prescribe what an instrument must contain and address, as well as the terms of use for the compensatory mitigation credits generated by the mitigation bank, conservation bank, or in-lieu fee program. Similarly, establishing habitat conservation plans ("HCPs") and natural community conservation plans ("NCCPs") requires an agreement. Existing policies and regulations prescribe what the agreement must contain and address, as well as the terms of use of the HCPs/NCCPs.

1.6 Coordination History

This document is intended to be both an internal communication tool between Caltrans' Functional Units[4] and an external communication tool for Caltrans to communicate with the Federal Highway Administration, applicable resource and regulatory agencies, other transportation agencies (MPOs, RTPAs, other public agencies that implement transportation improvements), Native American tribes, interested parties, and the public. It will be posted on the AMP website: http://www.dot.ca.gov/env/advancemitigation/.

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

1.6.1. 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

[3] The goal of conservation banks is, typically, to offset adverse impacts on a species, while the goal of mitigation banking is to replace the exact function and values of specific wetland or other aquatic habitats that will be adversely affected.
[4] "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, constructions, maintenance, landscape architecture, utilities, and engineering.

compensatory mitigation in that area (Section 7.2 of Caltrans 2019a). District 8 Transportation Planning conducted outreach and contacted the partners listed in Table 1-2.

Table 1-2. Regional Transportation Interaction and Outreach Summary

Date	Description
April 2019	Caltrans District 8 Transportation Planning and San Bernardino County Transportation Authority. Discussed the RAMNA and its potential nexus with the San Bernardino County Regional Conservation Investment Strategy ("RCIS"), in progress.
June 2019	Caltrans District 8 Transportation Planning and San Bernardino County Transportation Authority continued discussions started in April.
July 2019	Caltrans District 8 Transportation Planning and San Bernardino County. Discussed San Bernardino Countywide Vision – Environment Element. San Bernardino County provided Caltrans with a list of its partner agencies and stakeholders.

1.6.2. 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 3, 2020, Caltrans distributed this RAMNA for review by the Federal Highway Administration, resource and regulatory agencies, other transportation agencies (MPOs, RTPAs, and other public agencies that implement transportation improvements), Native American tribes, interested parties, and the public. On March 10, 2020, Caltrans held an informational meeting for all interested parties that consisted of a presentation, followed by questions and answers. Attendees could attend in-person at the Caltrans District 8 office or virtually. Most reviewers provided their comments within 30 days and the resource and regulatory agencies provided their comments within 60 days. Each commenter and the date of their communication is listed in Table 1-3. Caltrans followed

up with some commenters for clarification. 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	April 17, 2020
CDFW[a]	March 10, 2020 and May 12, 2020
Corps, Los Angeles District	May 8, 2020
EPA	May 11, 2020
FWS	May 13, 2020
State Water Board	May 11, 2020
Bureau of Land Management ("BLM"), California Desert District	April 3, 2020
The Nature Conservancy of California	April 20, 2020
Wildlands	April 3, 2020
The Habitat Institute	March 16, 2020 and April 2, 2020
Town of Apple Valley Multi-Species Habitat Conservation Plan Plan/Natural Community Conservation Plan	April 3, 2020

Note: TBP = to be provided

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

1.6.3. 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 resource 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). As per the Master Process Agreement, a meeting between Caltrans and the resource and regulatory agencies was held within 60 days of distribution on the RAMNA. The date of the meeting, the resources discussed, and meeting participants are presented in Table 1-4. Additional meetings were held with each agency who submitted comments. Each discussion informed this document.

Table 1-4. Interagency Meetings

Meeting Date	Resource(s) Discussed/ Discussion Summary	Meeting Participants
April 21, 2020	Species that co-occur with desert tortoise habitat; aquatic resources used by desert tortoise. Status of various administrative pathways applicable to activities authorized in SHC § 800 et seq.	CDFW Habitat Conservation Branch CDFW Region 4 CDFW Region 5 CCC NMFS State Water Board Corps, Sacramento District Corps, San Francisco District Corps, Los Angeles districts FWS Pacific Southwest Region FWS Carlsbad Field Office Caltrans District 8 Caltrans AMP
May 20, 2020	Program overview, FWS' desert tortoise goals and objectives, Mojave Desert goals and objectives	FWS Pacific Southwest Region FWS Carlsbad Field Office Caltrans District 8 Caltrans AMP
June 18, 2020	Program overview, Corps' conservation goals and objectives	Corps, Los Angeles District Caltrans District 8 Caltrans AMP
June 23, 2020	Program overview, species of mitigation need, co-benefitting species, SAMNA, connectivity	CDFW Habitat Conservation Branch CDFW Region 4 CDFW Region 5 Caltrans District 8 Caltrans AMP
June 24, 2020	Program overview, waters of the state, waters of the state goals and objectives	State Water Board Caltrans District 8 Caltrans AMP
June 29, 2020	EPA goals and objectives, agency and public coordination	EPA Caltrans District 8 Caltrans AMP

1.7 Document Organization

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

Table 1-5. Document Organization

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

Chapter	Title	Content
Appendices	Various	Appendices supporting this document: Appendix A – GIS Sources Appendix B – Ecoregion Subsection Descriptions Appendix C – Land Cover Types Appendix D – Complete SAMNA Species Results Appendix E – Hydrologic Units Appendix F – Aquatic Resource Locations

This page is intentionally left blank.

2. ENVIRONMENTAL SETTING

The GAI coincides with the approximately 16.5-million-acre portion of the Mojave Desert Ecoregion Section located in California. Ecoregion sections are defined as the largest ecological unit of the U.S. Department of Agriculture ("USDA") Forest Service ("USFS") National Hierarchical Framework of Ecological Units, which are nested within larger provinces (Cleland et al. 1997). The Mojave Desert Ecoregion Section is within the larger American Semidesert and Desert Province (McNab et al. 2007).

In this chapter, Caltrans describes the ecoregion subsections of the larger Mojave Desert Ecoregion Section (McNab et al. 2007) in terms of land ownership, topography, climate, land cover types, invasive species, special-status species, wildlife movement, and aquatic resources in relation to the GAI boundary. Intended to inform advance mitigation project scoping, this assessment relies upon readily available literature and GIS sources, including the vegetation and other geospatial data layers developed for the SAMNA Reporting Tool (Caltrans 2017a). Sources used for this assessment are cited throughout the chapter, and links to GIS sources are provided in Appendix A.

On each figure, Caltrans has provided the general location of planned SHOPP and STIP-eligible transportation projects that may require compensatory mitigation, as a resource and/or regulatory agency permit condition, during the 10-year planning period addressed by this document. More information about the GAI's road infrastructure is provided in Section 1.3, and additional information about planned transportation projects is provided in Chapter 5.

2.1 Mojave Desert Ecoregion Subsections

Sixteen ecoregion subsections occur in the GAI, as summarized in Table 2-1 and depicted on Figure 2-1. Ecoregion subsections in the GAI were excerpted from the SAMNA Reporting Tool (Caltrans 2019b). Brief ecoregion subsection descriptions are provided in Appendix B. Land cover is described by ecoregion subsection in Section 2.5, and is depicted on maps provided in Appendix C.

Table 2-1. Subsections of the Mojave Desert Ecoregion Section

Subsection Name	Code[a]	Acreage[b]	Subsection as Percentage of GAI
Amargosa Desert-Pahrump Valley	322Ac	441,552	2.7
Bullion Mountains-Bristol Lake	322Ao	1,185,755	7.2
Death Valley	322Ab	843,083	5.1
Funeral Mountains-Greenwater Valley	322Ad	842,385	5.1
High Desert Plains and Hills	322Ag	3,137,312	19.0
Ivanpah Valley	322Ak	298,010	1.8
Kingston Range-Valley Wells	322Aj	889,780	5.4
Lucerne-Johnson Valleys and Hills	322An	1,467,603	8.9
Mojave Valley-Granite Mountains	322Ah	1,984,607	12.0
Owens Valley	322Aa	446,999	2.7
Panamint Valley	322Ae	250,564	1.5
Pinto Basin and Mountains	322Ap	692,062	4.2
Piute Valley-Sacramento Mountains	322Am	1,093,502	6.6
Providence Mountains-Lanfair Valley	322Al	1,429,876	8.7
Searles Valley-Owlshead Mountains	322Af	842,955	5.1
Silurian Valley-Devil's Playground	322Ai	661,216	4.0
	Total	**16,507,261**	**100%**

Source: Caltrans 2017a
[a] USFS ecological unit subsection codes
[b] Numbers were rounded to the nearest whole number.

2.2 Land Ownership

The GAI spans Inyo, San Bernardino, Kern, Los Angeles, and Riverside counties (Figure 1-1). Approximately 77.4 percent of land in the GAI is federally administered and managed by the U.S. Department of Interior, which manages the Bureau of Land Management ("BLM"), National Park Service ("NPS"), and FWS; the U.S. Department of Defense, which manages U.S. military bases; USDA, which manages USFS; and the Corps (Figure 2-2, Table 2-2). National park land includes Death Valley National Park, Mojave National Preserve, Joshua Tree National Park, Castle Mountain National Monument, and the Manzanar National Historic Site. USFS lands include the Inyo National Forest, San Bernardino National Forest, and Angeles National Forest. Approximately 2.2 percent of land in the GAI consists of state-managed lands, including lands owned by the California State Lands Commission.

Figure 2-1. Mojave Desert Ecoregion Subsections

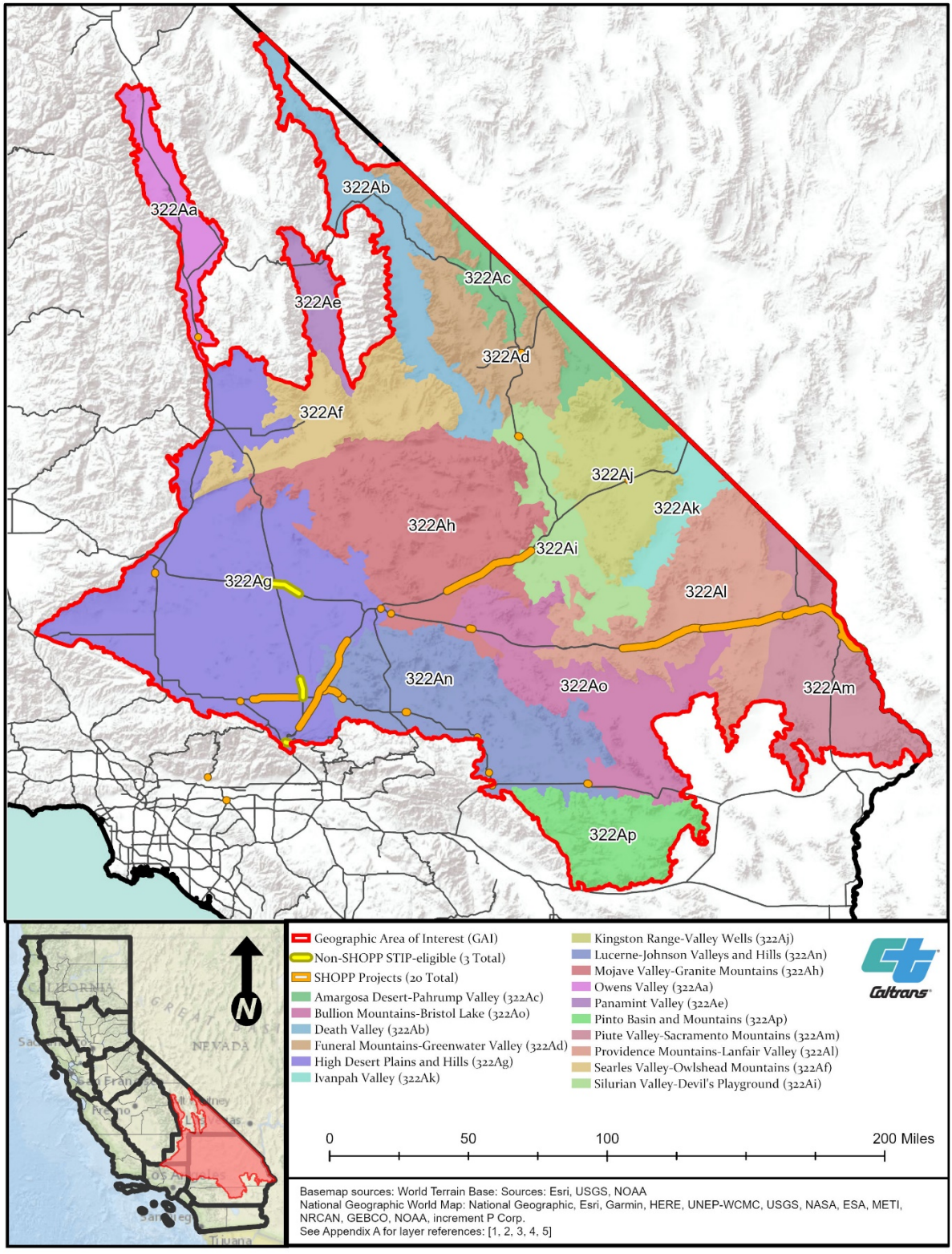


Figure 2-2. Federal Land Ownership

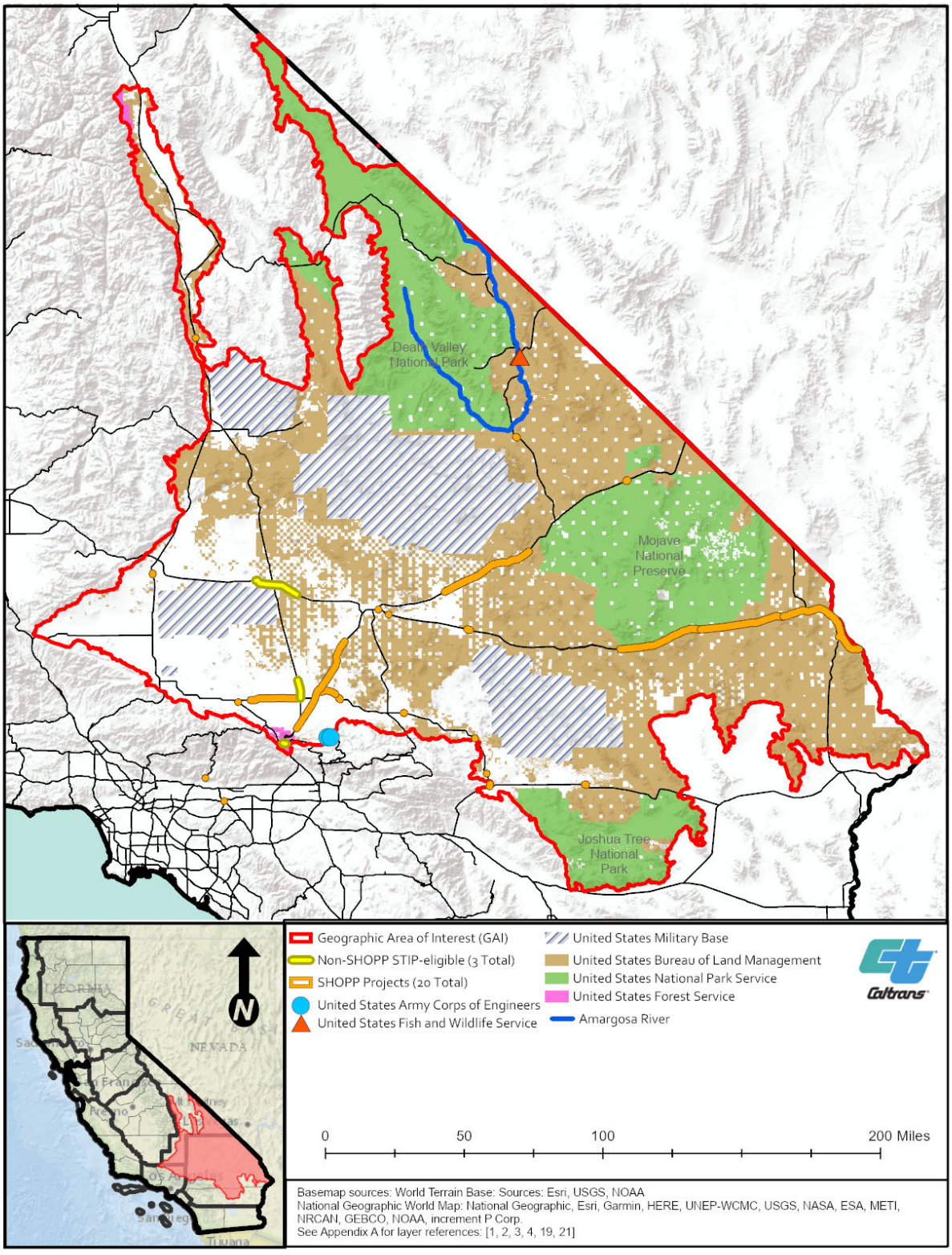
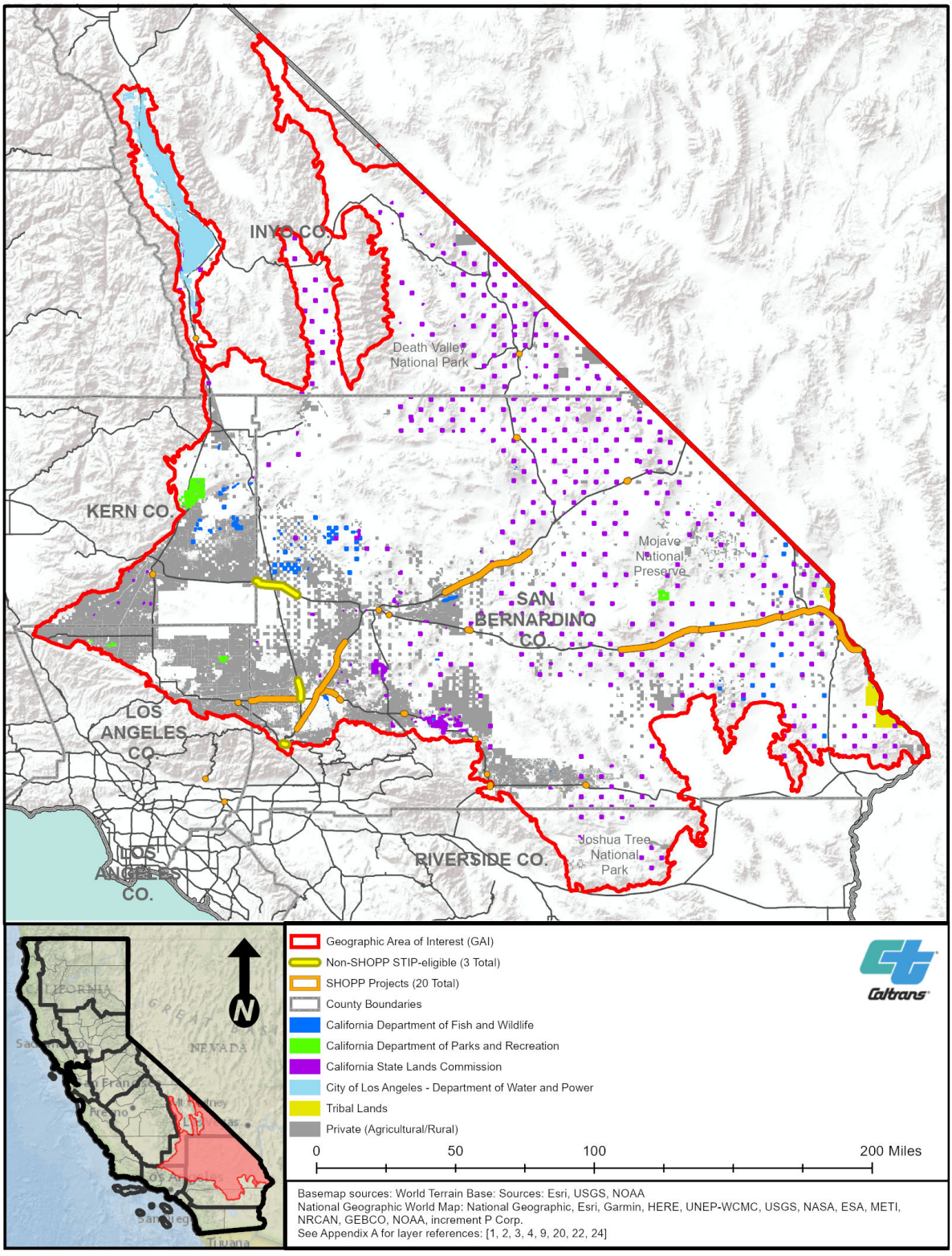


Figure 2-3. Other Land Ownership



Other lands in the GAI are owned by Native American tribes, counties, cities, and joint power authorities (Figure 2-3, Table 2-2). The remainder of the land in the GAI consists of private lands.

Table 2-2. Land Ownership

Land Owner or Land Use	Number of Parcels	Total Acreage per Agency/Owner[a]	Ownership as Percentage of GAI
Corps	66	1,867	0.01
FWS	20	543	0.003
U.S. military bases	5,614	2,461,237	14.90
BLM	43,272	6,425,927	38.91
NPS	8,744	3,833,619	23.21
USFS	647	56,444	0.34
CDFW	733	39,798	0.24
California Department of Parks and Recreation	392	41,315	0.25
California State Lands Commission	2,567	271,941	1.65
Tribal lands	881	39,419	0.24
Desert and Mountain Conservation Authority	37	522	0.003
Nonprofit conservancy and land trust	1,059	34,018	0.21
University of California (“UC”)	13	1,588	0.01
City, county, and special district	4,150	217,067	1.31
Other public lands	41,098	220,692	1.34
Public (unassigned)	0	135,863	0.82
Private (agricultural/rural)	378,639	2,628,643	15.92
Private (unassigned)	319,496	188,072	1.14
Total	**807,428**	**16,598,575**	**100%**

Sources: Bureau of Indian Affairs; California Protected Lands Database; California Conservation Easement Database; Caltrans 2017a; 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 provides an inventory of lands that are owned in fee or protected for open space purposes, throughout California, by over 1,000 public and non-profit organizations. These protected lands are managed for 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. These lands have been 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 USGS' Protected Areas Database of the U.S.

Available protected lands and their associated GAP status ranks are indicated on Figure 2-4. Not all California Protected Areas Database lands have GAP status ranks, and some may be out of date; for example, congressionally designated Wilderness Areas managed by the BLM and NPS should be considered as GAP Status 2 but are included as GAP 3 on Figure 2-4 (BLM, pers. com., April 3, 2020). Nevertheless, as shown on Figure 2-4, in the GAI, no GAP status 1 lands are identified in the database and most of the planned SHOPP or STIP-eligible transportation projects are in areas with a GAP status of 2 or 3.

As indicated in Table 2-2, BLM and NPS are the primary land managers in the GAI, managing 38.9 and 23.2 percent of the land, respectively. In 1976, Congress designated 25 million acres of desert land in southern California as the California Desert Conservation Area (CDCA) through the Federal Land Management Act. In 2009, Congress directed BLM to include conservation lands within the CDCA as National Conservation Lands through the Public Land Management Act. The Desert Renewable Energy Conservation Plan (DRECP) Land Use Plan Amendment (LUPA) (BLM 2016) is a comprehensive plan that addresses protection of natural resources on 10.8 million acres of desert land within the California Desert National Conservation Lands (CDNCLs), which is managed by BLM (Figure 2-2). CNDCLs are "nationally significant landscapes within the CDCA with outstanding cultural, ecological, and scientific values" (BLM 2016).

Wilderness Areas congressionally designated by the Wilderness Act of 1964 (16 U.S.C. 1131-1136) that are managed by the BLM and NPS and Areas of Critical Environmental Concern (ACECs) are shown on Figure 2-5. ACECs are areas designated during the land use planning process where special management attention is needed to protect important historical, cultural, and scenic values, fish and wildlife or other natural resources, or human life and safety from natural hazards (BLM 2020). Many of the ACECs also occur within CDNCLs.

Figure 2-4. Protected Lands

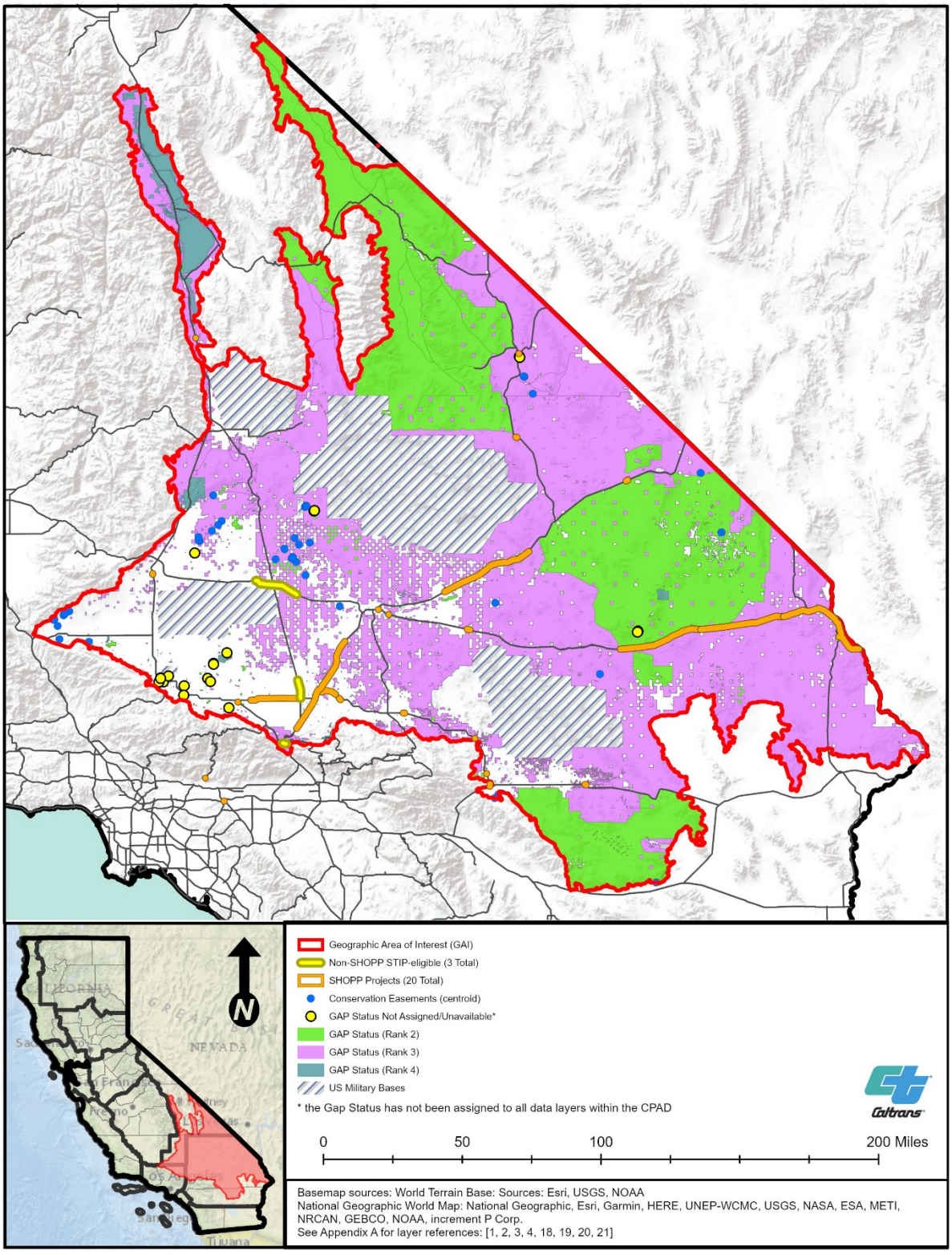
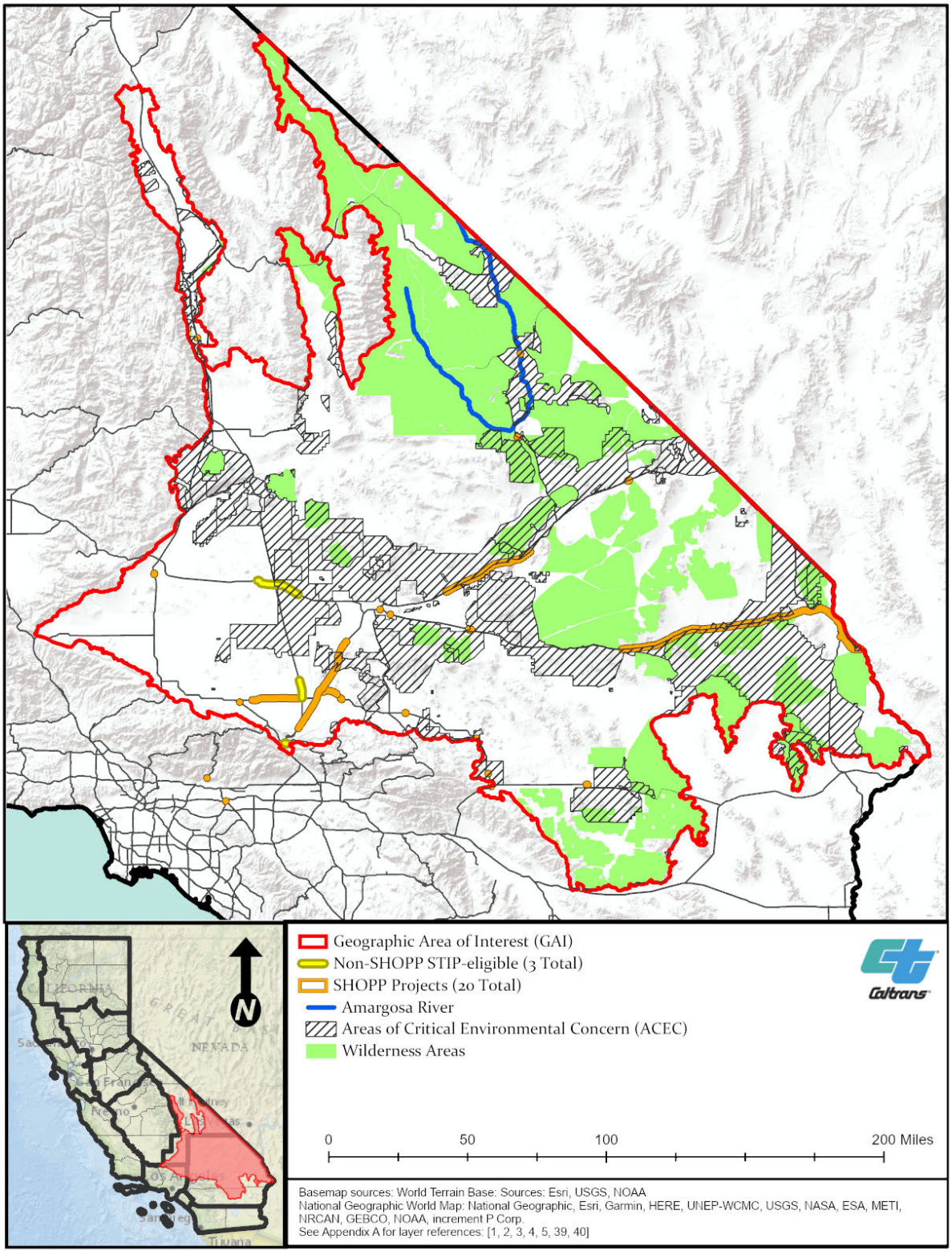


Figure 2-5. Wilderness Areas and Areas of Critical Environmental Concern



2.3 Topography

As noted in Section 2.1, the GAI is located in the Mojave Desert (Figure 2-6). Elevations in the GAI range from 7,933 feet above mean sea level at Clark Mountain to 280 feet below mean sea level at Death Valley, with an average elevation of 3,500 feet. Because of its high average elevation, the GAI is considered a high desert. Topographical boundaries include the Inyo Mountains to the north, the Tehachapi Mountains to the west, the San Gabriel Mountains and San Bernardino Mountains to the southwest, the Colorado River to the southeast, and the Mojave Desert to the east (Figure 2-6). The mountain boundaries are distinct because they are outlined by the San Andreas and Garlock Faults.

2.4 Climate

The GAI is characterized by extreme daily temperature fluctuations, strong seasonal winds, and clear skies, with an average temperature range from 45 to 75 degrees Fahrenheit (USFS 1994). However, temperatures can drop below 20 degrees Fahrenheit in the valleys and below freezing at the higher elevations, while Death Valley can sometimes reach temperatures of 120 degrees Fahrenheit in July and August (Randall et al. 2010). Mean annual precipitation ranges from 1.3 to 12.2 inches, with a long-term average between 1893 and 2001 of 5.4 inches. Cool season precipitation averages 3.7 inches, while warm season precipitation averages 1.4 inches.

2.4.1. Climate Resiliency

Caltrans is using a statewide climate vulnerability assessment conducted by the University of California ("UC"), Davis for CDFW (Caltrans 2019c) to address potential vulnerabilities of planned transportation projects. The effects of climate change in the GAI pose risks for transportation infrastructure, which 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 wildfire and flooding.

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

were assigned climate resilience ranks ranging from 1 (low resilience or low probability that the terrestrial location will contain climate refugia) to 5 (high resilience or high probability that the terrestrial location will contain climate refugia) (CDFW 2018a).

As shown on Figure 2-7, the predicted climate resilience of the GAI ranges from areas with low resilience, located primarily in the lower-elevation southeastern and extreme western parts of the GAI, to areas with high resilience, located primarily in the higher-elevation central and northeastern parts of the GAI. Most of the planned SHOPP and STIP-eligible transportation project locations do not coincide with terrestrial locations determined to have higher climate resilience value.

2.5 Land Cover Types

Land cover types in the GAI were excerpted 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 2017b). Based on these data, shrub-dominated habitats account for the largest habitat type in the GAI, encompassing 84.6 percent of the GAI, with desert scrub the most common (Table 2-3, Appendix C). Tree-dominated habitats account for 6.2 percent of the GAI, with Joshua tree woodland the most common. Herbaceous-dominated habitats account for 1.4 percent of the GAI, with annual grassland the most common. Aquatic habitats account for less than 0.2 percent of the GAI. Developed and non-vegetated habitat types (barren areas) combined account for 7.6 percent of the GAI. Land cover is generally shown on Figure 2-8, while general habitat types and the subecoregions in which they occur are depicted on the maps provided in Appendix C.

Figure 2-6. Topography

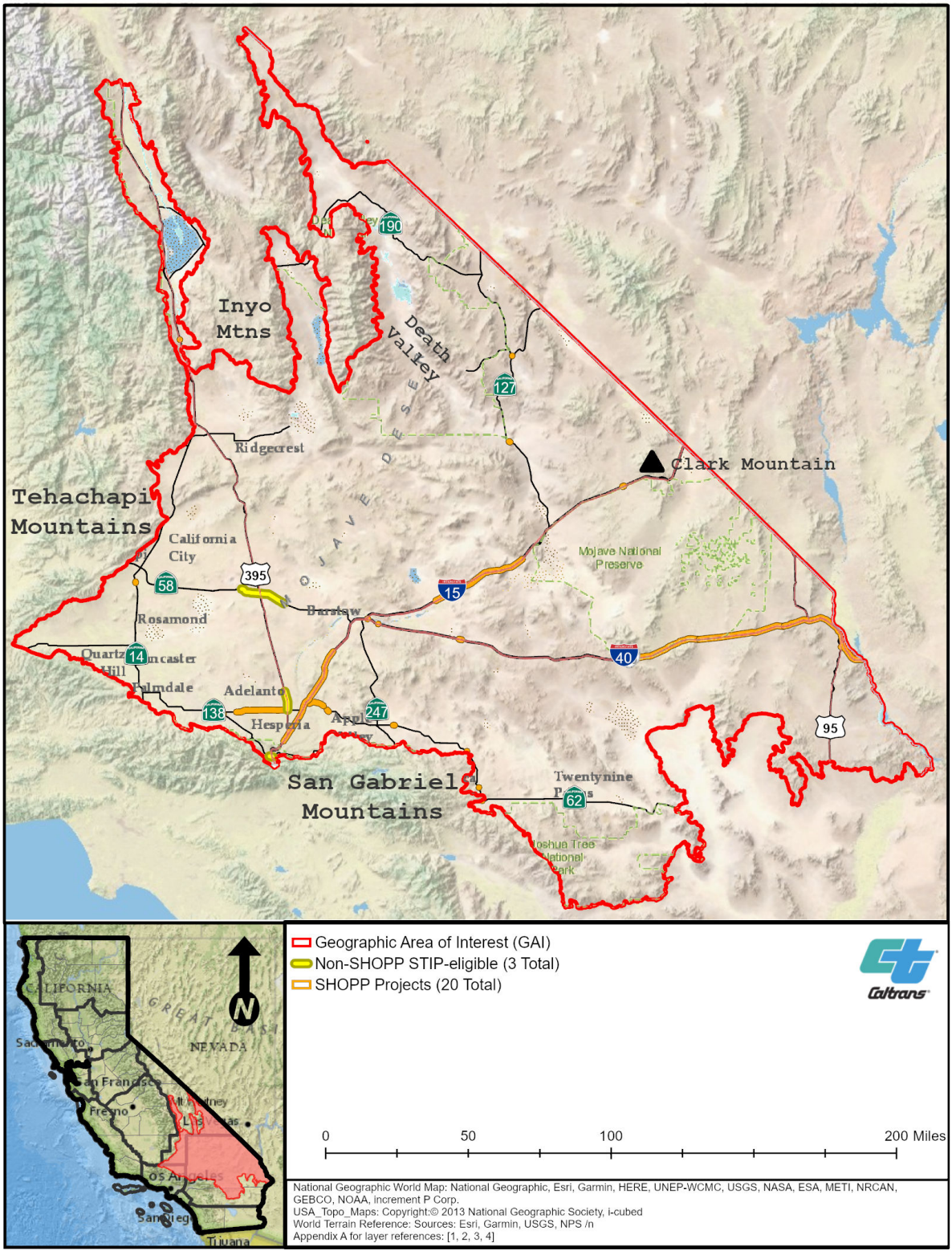


Figure 2-7. Terrestrial Climate Resilience Rankings

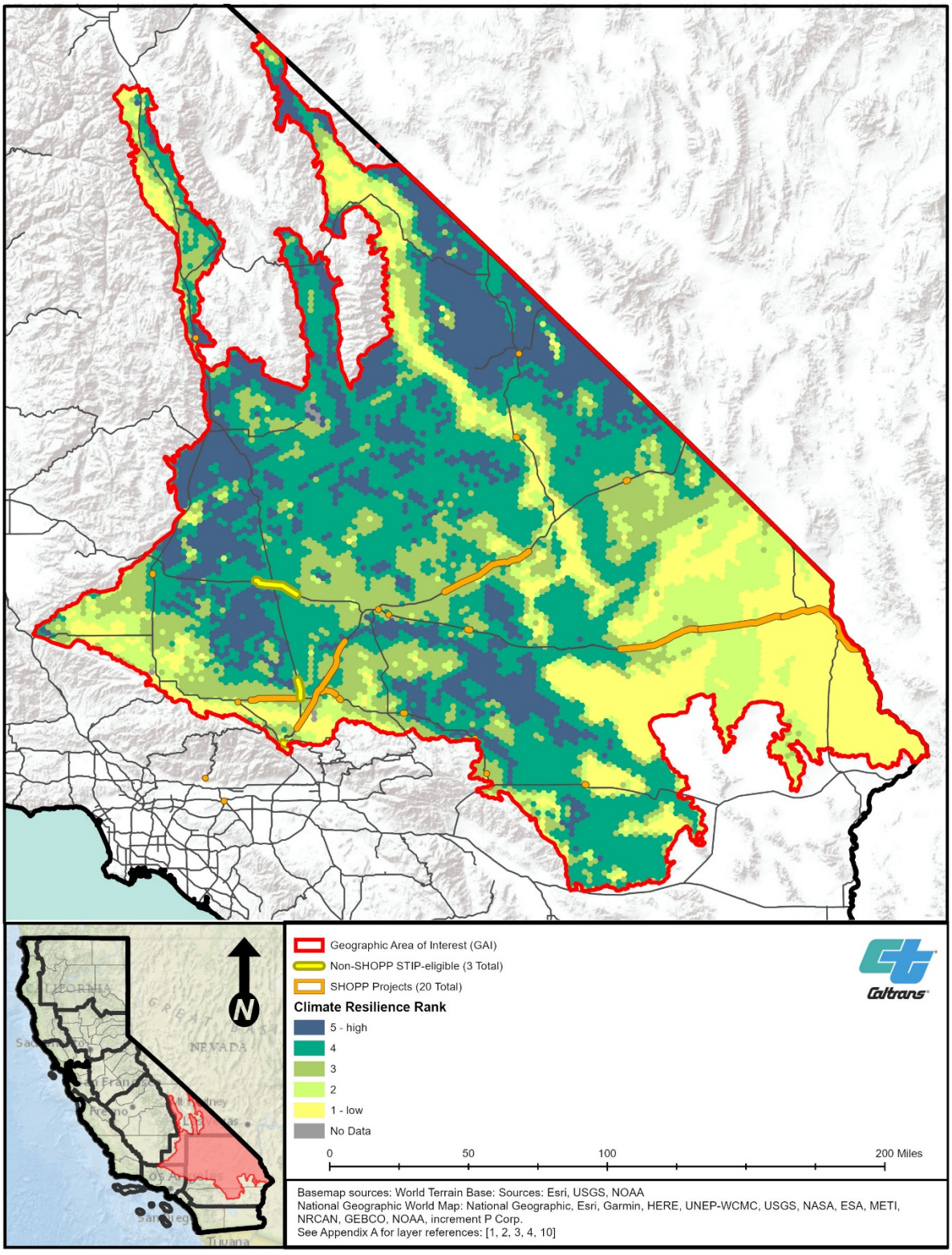


Figure 2-8. Major Land Cover

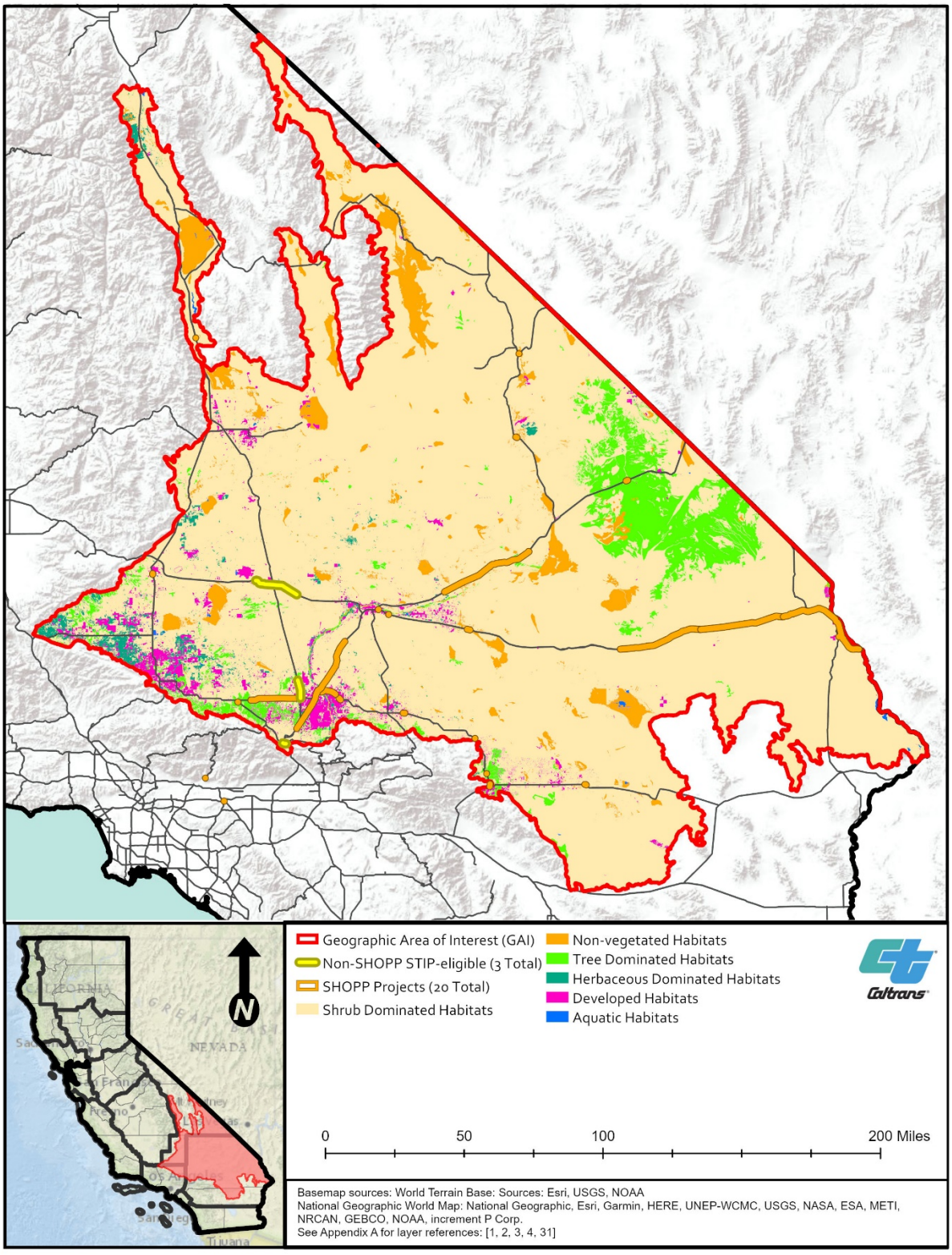


Table 2-3. Land Cover Types

CWHR Habitat Type	Acres[a]	Cover as Percentage of GAI
Tree-dominated Habitats	**1,026,945**	**6.22**
Aspen	11	0.0001
Blue Oak-Foothill Pine	212	0.001
Blue Oak Woodland	980	0.01
Coastal Oak Woodland	16	0.0001
Desert Riparian	28,417	0.17
Joshua Tree	800,285	4.85
Juniper	135,028	0.82
Montane Hardwood-Conifer	162	0.001
Montane Hardwood	1,401	0.01
Montane Riparian	1,072	0.01
Pinyon-Juniper	57,955	0.35
Palm Oasis	61	0.0004
Valley Oak Woodland	611	0.004
Valley Foothill Riparian	735	0.004
Shrub-dominated Habitats	**13,977,268**	**84.63**
Alkali Desert Scrub	1,148,427	6.94
Bitterbrush	6,499	0.04
Chamise-Redshank Chaparral	92	0.001
Chamise-Redshank Chaparral; Mixed Chaparral	383	0.002
Coastal Scrub	17	0.0001
Desert Scrub	11,889,602	72.00
Desert Scrub; Desert Wash	27,835	0.17
Desert Scrub; Perennial Grassland	288	0.002
Desert Succulent Shrub	397,593	2.41
Desert Succulent Shrub; Desert Wash	2,228	0.01
Desert Wash	322,926	1.96
Low Sage	347	0.002
Mixed Chaparral	59,825	0.36
Montane Chaparral	238	0.001

CWHR Habitat Type	Acres[a]	Cover as Percentage of GAI
Sagebrush	120,968	0.73
Herbaceous-dominated Habitats	**230,454**	**1.40**
Annual Grassland	223,570	1.35
Fresh Emergent Wetland	1,294	0.01
Pasture	34	0.0002
Perennial Grassland	1,934	0.01
Saline Emergent Wetland	600	0.004
Wet Meadow	3,022	0.02
Aquatic Habitats	**29,278**	**0.18**
Lacustrine	27,921	0.17
Riverine	1,051	0.01
Water	306	0.002
Developed Habitats	**450,581**	**2.73**
Agriculture	73	0.0004
Cropland	900	0.01
Cropland; Barren	2	0.00001
Deciduous Orchard; Vineyard	6,444	0.04
Evergreen Orchard	7	0.00004
Irrigated Row and Field Crops	72,337	0.44
Irrigated Hayfield	244	0.001
Urban	370,575	2.24
Non-vegetated Habitats	**798,822**	**4.84**
Barren	798,822	4.84
Total	**16,513,348**	**100%**

Source: Caltrans 2017b
[a] Numbers were rounded to the nearest whole number.

2.6 Invasive Species

Both invasive plant and animal species are known to occur in the GAI. Invasive species may affect native species, including special-status species, through direct competition 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. In the GAI, invasive plant species have been specifically identified as threats or stressors to terrestrial biological resources, including desert

tortoise, and aquatic resources (Abella and Berry 2016; Randall et al. 2010). They can also increase fire hazards in a community that is not dependent on or adapted to large or frequent fires (Joshua Tree National Park 2015).

Several entities 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 2019).

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. Some of these species that occur in the GAI include giant reed (*Arundo donax*), Sahara mustard (*Brassica tournefortii*), red brome (*Bromus madritensis* ssp. *rubens*), cheatgrass (*Bromus tectorum*), ripgut brome (*Bromus diandrus*), yellow starthistle (*Centaurea solstitialis*), and tamarisk or saltcedar (*Tamarix* spp.) (Cal-IPC 2019; Desert Tortoise Preserve Committee 2019; Randall et al. 2010). Randall et al. (2010) observe that giant reed and tamarisk are particularly problematic in riparian areas because they compete with native plants for water and also increase soil salinity.

Nonnative animals that are/may be present in the GAI and that can negatively affect aquatic species include bullfrogs (*Rana catesbiana*), red swamp crayfish (*Procambarus clarkia*), and western mosquitofish (*Gambusia affinis*). Nonnative animals that are/may be present in the GAI and can negatively affect terrestrial wildlife through competition, predation, or parasitism include European starlings (*Sturnus vulgaris*), wild turkeys (*Meleagris gallopavo*), brown-headed cowbirds (*Molothrus ater*), feral goats, horses, sheep, and burros, with burros likely providing the greatest potential threat because of their ability to go without water for long periods of time and their competition with bighorn sheep for resources, as observed during a study by CDFW (Weaver 1974). Invasive animal species that are/may be associated with urban areas include domestic dogs (*Canis lupus familiaris*), domestic cats (*Felis catus*), Argentine ants (*Linepithema humile*), and fire ants (*Solenopsis* sp.) (Randall et al. 2010).

2.7 Special-status Species

Special-status terrestrial species known to occur or with the potential to occur in the GAI were excerpted from the SAMNA Reporting Tool's species-attributed vegetation data layer, which was developed using the CWHR (CDFW 2019a), the Jepson Herbarium's floristic province layer, CDFW's RareFind 5 database (CDFW 2019b), and other information (Caltrans 2019b). Special-status species include 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). The species-attributed list developed for the SAMNA Reporting Tool depends on a species having a defined geographic range or having occurrences documented in the California Natural Diversity Database (Caltrans 2019b).

Terrestrial species, including special-status species, with the potential to occur in the GAI and their associated habitats are listed in Appendix D. Based on a search of the species-attributed vegetation layer, 105 special-status terrestrial species are known to occur or have the potential to occur in the GAI. The numbers of special-status species by habitat type are shown in Table 2-4. One special status fish, the Mojave tui chub (*Siphateles bicolor mohavensis*), also has the potential to occur in the GAI (Caltrans 2019b). Although this information is suitable for advance mitigation project scoping, site specific studies would be required to establish compensatory mitigation credits.

Table 2-4. Number of Potentially Occurring Special-status Species, by Land Cover Type

Land Cover Type	Cover as Percentage of GAI	Plants	Amphibians	Reptiles	Birds	Mammals
Tree-dominated Habitats	See below	See below	See below	See below	See below	See below
Desert Riparian	0.17	0	1	2	19	13
Joshua Tree	4.85	1	0	2	6	10
Juniper	0.82	0	0	1	6	7
Valley Foothill Riparian	0.004	0	2	1	10	8
Shrub-dominated Habitats	See below	See below	See below	See below	See below	See below
Alkali Desert Scrub	6.95	0	0	3	7	15
Desert Scrub	72.00	2	2	4	11	18
Desert Succulent Shrub	2.41	0	0	1	5	10
Desert Wash	1.96	0	0	2	7	13
Mixed Chaparral	0.36	1	2	1	8	11
Sagebrush	0.73	0	0	1	6	10

Land Cover Type	Cover as Percentage of GAI	Plants	Amphibians	Reptiles	Birds	Mammals
Herbaceous-dominated Habitats	See below	See below	See below	See below	See below	See below
Annual Grassland	1.35	2	1	2	9	12
Aquatic Habitats	See below	See below	See below	See below	See below	See below
Lacustrine	0.17	0	1	0	7	5
Riverine	0.01	0	0	0	9	7
Developed Habitats	See below	See below	See below	See below	See below	See below
Irrigated Row and Field Crops	0.44	0	0	0	1	6
Urban	2.24	0	0	0	13	9
Non-vegetated Habitats	See below	See below	See below	See below	See below	See below
Barren	4.84	0	0	2	7	5

Source: Caltrans 2019b

2.8 Critical Habitat

FWS designated critical habitat for the Mojave population of desert tortoise on February 8, 1994 (59 *Federal Register* 5820–5866). The GAI also includes federally designated final critical habitat for the following 13 additional species and proposed critical habitat for 1 additional species (FWS 2019).

- Amargosa niterwort (*Nitrophila mohavensis*)
- Cushenbury buckwheat (*Eriogonum ovalifolium* var. *vineum*)
- Cushenbury milk-vetch (*Astragalus albens*)
- Lane Mountain milk-vetch (*Astragalus jaegerianus*)
- Parish's daisy (*Erigeron parishii*)
- bonytail chub (*Gila elegans*)
- razorback sucker (*Xyrauchen texanus*)
- arroyo toad (*Anaxyrus californicus*)
- California condor (*Gymnogyps californianus*)
- Inyo California towhee (*Pipilo crissalis eremophilus*)

- southwestern willow flycatcher (*Empidonax traillii extimus*)
- Amargosa vole (*Microtus californicus scirpensis*)
- Sierra Nevada bighorn sheep (*Ovis canadensis sierrae*)
- yellow-billed cuckoo (proposed) (*Coccyzus americanus*)

Critical habitat for these species is indicated on Figure 2-9. Please note, critical habitat represented by points on Figure 2-9 are critical habitat units too small to depict at the GAI-level. Several of the planned SHOPP and STIP-eligible transportation projects occur within or adjacent to areas with designated final critical habitat for desert tortoise and arroyo toad.

2.9 Wildlife Movement

The California Essential Habitat Connectivity ("CEHC") Project, a statewide assessment commissioned by CDFW and Caltrans, identified large remaining blocks of intact habitat or natural landscape that support native biodiversity and modeled linkages or essential connectivity areas between them that need to be maintained, particularly as corridors for wildlife (CDFW 2018b; Spencer et al. 2010). These connectivity areas were broadly defined, focusing on ecological integrity rather than species-specific habitat needs, and also included potential riparian connections between landscape blocks.

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 2-10). It also incorporates species-specific, fine-scale linkage information developed at a regional scale, where available, and includes areas that were not evaluated by the CEHC Project. Connectivity ranks in the terrestrial connectivity dataset were assigned as follows:

- Rank 5 (irreplaceable and essential corridors) – includes channelized areas and priority species movement corridors
- Rank 4 (conservation planning linkages) – habitat connectivity linkages mapped in the CEHC and fine-scale regional connectivity studies that are based on species-specific models and represent the best connections between core natural areas
- Rank 3 (connections with implementation flexibility) – areas with connectivity importance, including core habitat areas and areas on the periphery of mapped habitat linkages
- Rank 2 (large natural habitat areas) – large blocks of natural habitat (greater than 2,000 acres) with relatively intact connectivity
- Rank 1 (limited connectivity opportunity) – areas where land use limits connectivity, including some lakes

Most of the planned SHOPP and STIP-eligible transportation projects occur in areas with a connectivity rank of 3 or 4, with fewer projects occurring in areas with a connectivity rank of 1 or 2. One project occurs in an area with a connectivity rank of 5.

The California Desert Connectivity Project includes detailed linkage designs developed at a finer resolution based on the needs of particular focal species, including desert tortoise, and ecological processes (Figure 2-11). These linkage designs identify areas where maintenance or restoration of ecological connectivity is essential for conserving the unique biological diversity of California's deserts. Landscape blocks within the California Desert Linkage Network in the GAI include the Mojave National Preserve, Kingston – Mesquite Mountains Wilderness, Stepladder – Turtle Mountains Wilderness, Whipple Mountains Wilderness, Joshua Tree National Park, Twentynine Palms and Newberry-Rodman Wilderness, Edwards Air Force Base, China Lake Naval Weapons Station – South Range, and China Lake Naval Weapons Station – North Range (Conservation Biology Institute 2013).

Figure 2-9. Critical Habitat

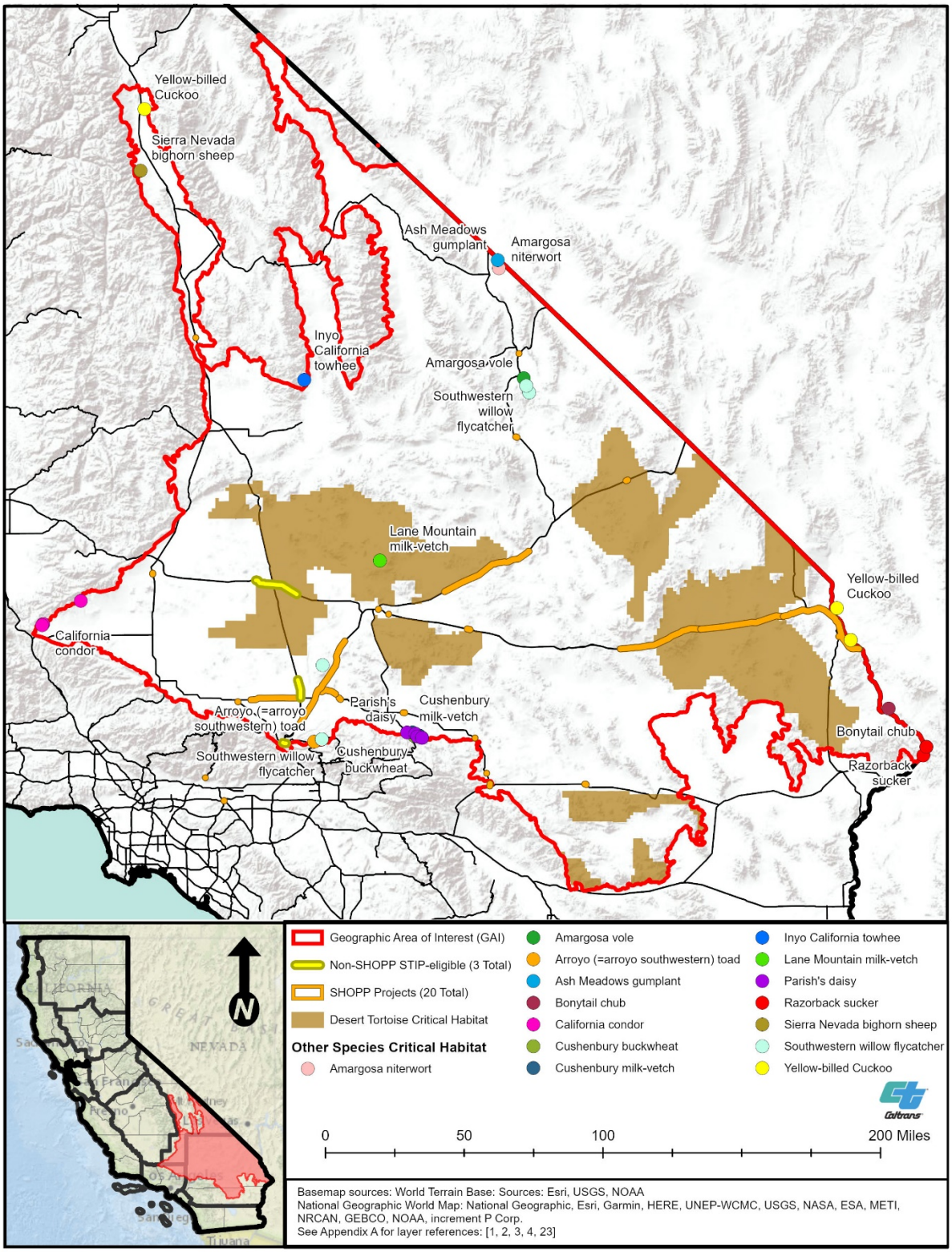


Figure 2-10. Terrestrial Connectivity

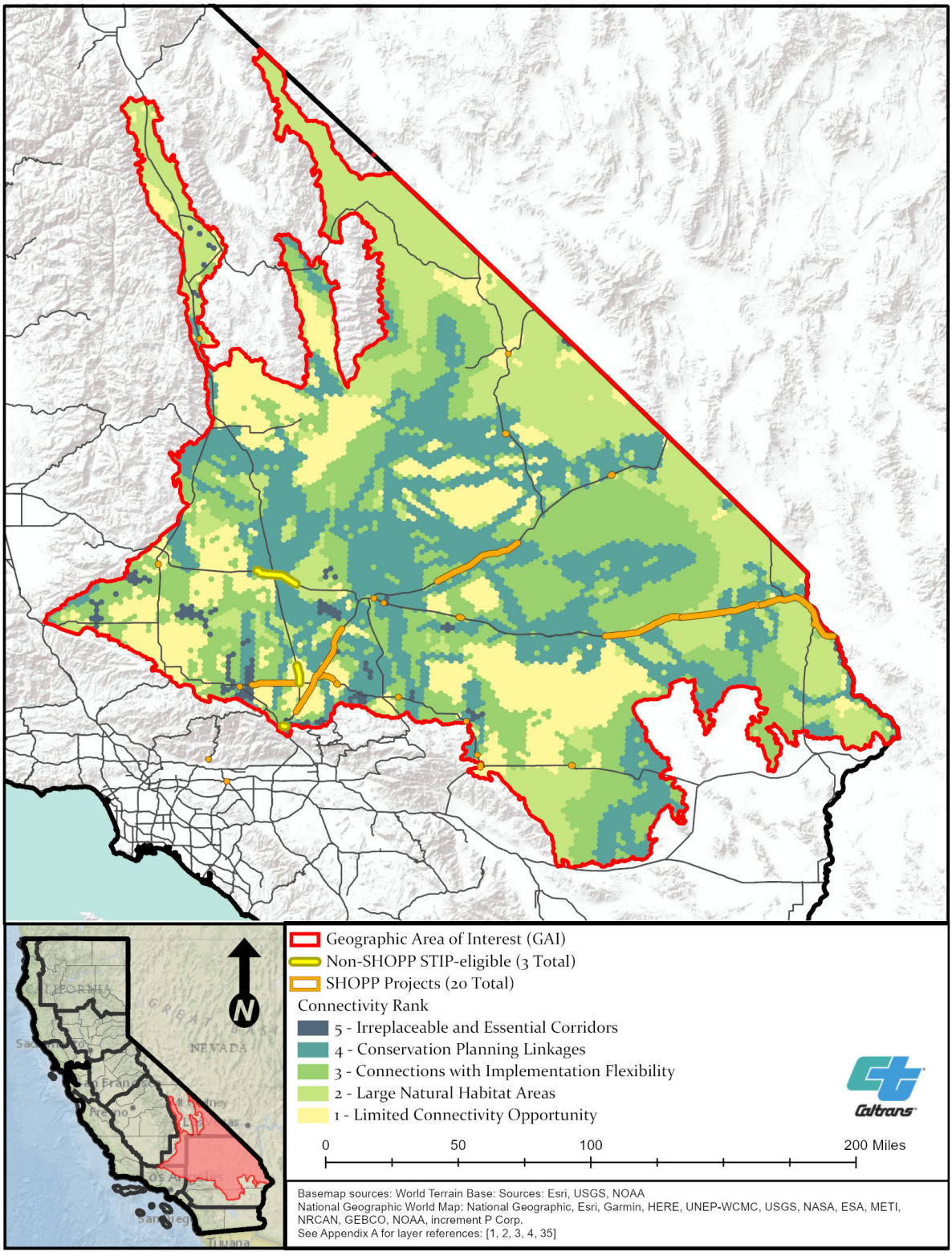
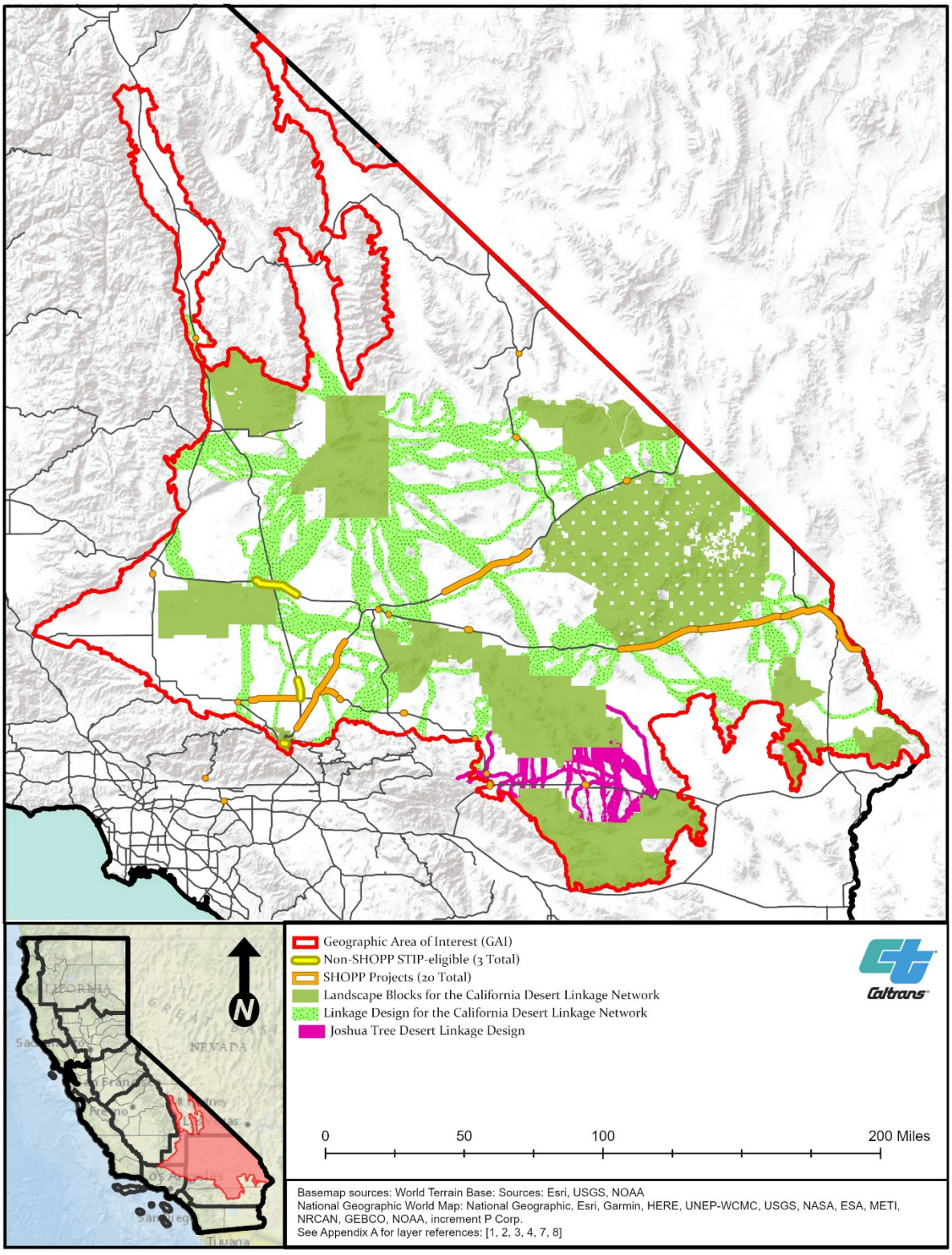


Figure 2-11. California Desert Linkage Network



2.10 Hydrology

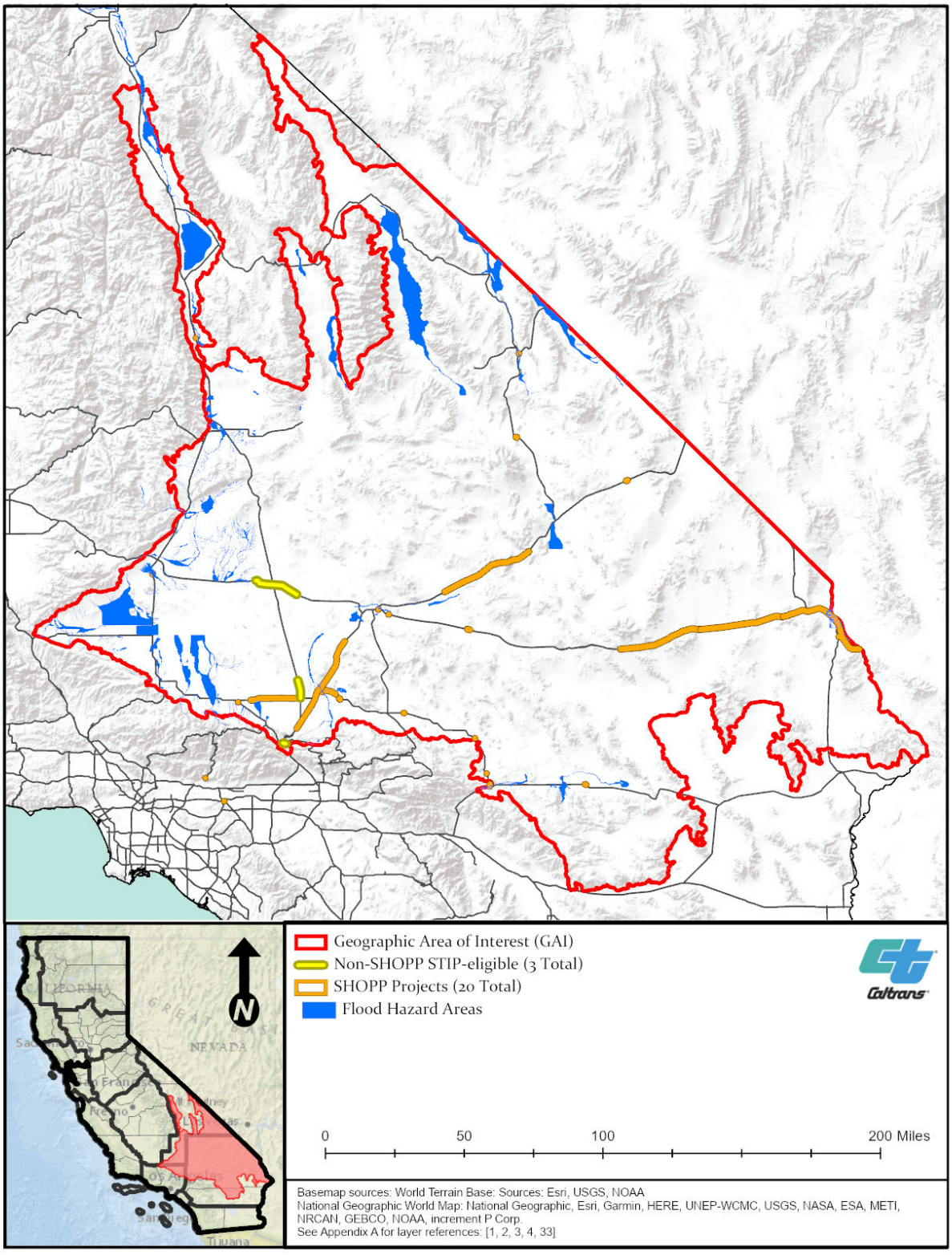
Major river systems in the GAI include the Mojave and Amargosa Rivers, which flow inland into underground basins, and the Colorado River. There are thousands of named and unnamed primary and secondary tributaries—as well as known dams, lakes, and diversions to these tributaries—in the GAI. Some of these tributaries are intermittent or ephemeral in nature and contribute water to the major tributaries only part of the year. Most tributaries do not flow to the ocean, and instead flow to terminal lakes where surface water evaporates or infiltrates to groundwater (Randall et al. 2010). Characteristic of a high desert, watercourses in the GAI experiences flash floods that are commonly associated with the irregular occurrence of precipitation (USGS 2004). Surface water is scarce, fed by infrequent snowmelt, springs, and rainfall, and is mostly carried seasonally along bedrock-controlled channels in the mountains to alluvial channels at lower elevations. Water generally flows east and south, toward the Colorado River.

2.11 Flood Hazard Areas

Flood hazard areas (Figure 2-12) correspond to Special 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 2019). As indicated on Figure 2-12, many of the planned SHOPP and STIP-eligible transportation projects cross flood hazard areas. In accordance with Executive Order 11988, all federally approved projects that encroach into a 100-year base floodplain must make an effort 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).

Figure 2-12. Flood Hazard Areas



2.12 Sub-basins

The Watershed Boundary Dataset maps the areal extent of surface water drainage within the U.S. A hierarchical system of nesting hydrologic units is used at various scales, each with an assigned HUC that is georeferenced to USGS topographic maps. Eight-digit hydrologic unit codes ("HUC-8") map the sub-basin level (USGS 2013). The California Department of Water Resources and, on occasion, the Water Boards, do not use HUC-8 codes; rather, they use hydrologic units ("HUs"), primarily for state-level water-related purposes, such as identifying beneficial uses.

HUC-8s and HUs do not always coincide with topographic watersheds—they only do so when their boundaries include all of the source area contributing surface water to a single defined outlet point. In this document, HUC-8s are referred to as sub-basins. Appendix E includes a crosswalk table of the sub-basins by HUC-8 code with names and numbers of HUs in the GAI.

The sub-basins of the GAI drain an area of approximately 32,825 square miles and overlap with both the Lahontan RWQCB and Colorado River RWQCB boundaries. Sub-basins in the Lahontan RWQCB boundary include Antelope-Fremont Valleys, Coyote-Cuddeback Lakes, Crowley Lake, Death Valley-Lower Amargosa River, Indian Wells-Searles Valleys, Ivanpah-Pahrump Valleys, Mojave, Owens Lake, Panamint Valley, and Upper Amargosa (Table 2-5, Figure 2-13). Sub-basins in the Colorado River RWQCB boundary include Havasu-Mojave Lakes, Imperial Reservoir, Piute Wash, Salton Sea, and Southern Mojave (Table 2-6, Figure 2-13).[1] Sub-basin acreages shown in Tables 2-5 and 2-6 may include areas outside of the GAI. Figure 2-13 includes sub-basins in the GAI and identifies state-level HUs.

[1] Watersheds in the Santa Ana and Los Angeles RWQCBs' jurisdiction are excluded from this section because they occupy a very small area in the GAI, and no proposed projects are in areas under their jurisdiction.

Table 2-5. Sub-basins in the Lahontan RWQCB within the GAI

Sub-basin Name	Sub-basin Code (HUC-8)	Drainage Area (acres)[a]	Rivers and Streams (count)	Total Reach Length (miles)[a]
Antelope-Fremont Valleys	18090206	1,960,557	6,292	8,470
Coyote-Cuddeback Lakes	18090207	1,138,937	1,978	4,205
Crowley Lake	18090102	244,282	0	0
Death Valley-Lower Amargosa	18090203	3,101,951	9,143	16,372
Indian Wells-Searles Valleys	18090205	1,250,277	7,177	8,133
Ivanpah-Pahrump Valleys	16060015	550,851	2,977	3,642
Mojave	18090208	3,101,951	4,100	9,154
Owens Lake	18090103	735,586	4,897	4,624
Panamint Valley	18090204	841,293	6,295	7,759
Upper Amargosa	18090202	730,378	1,352	3,116
	Total	**13,656,063**	**44,211**	**65,475**

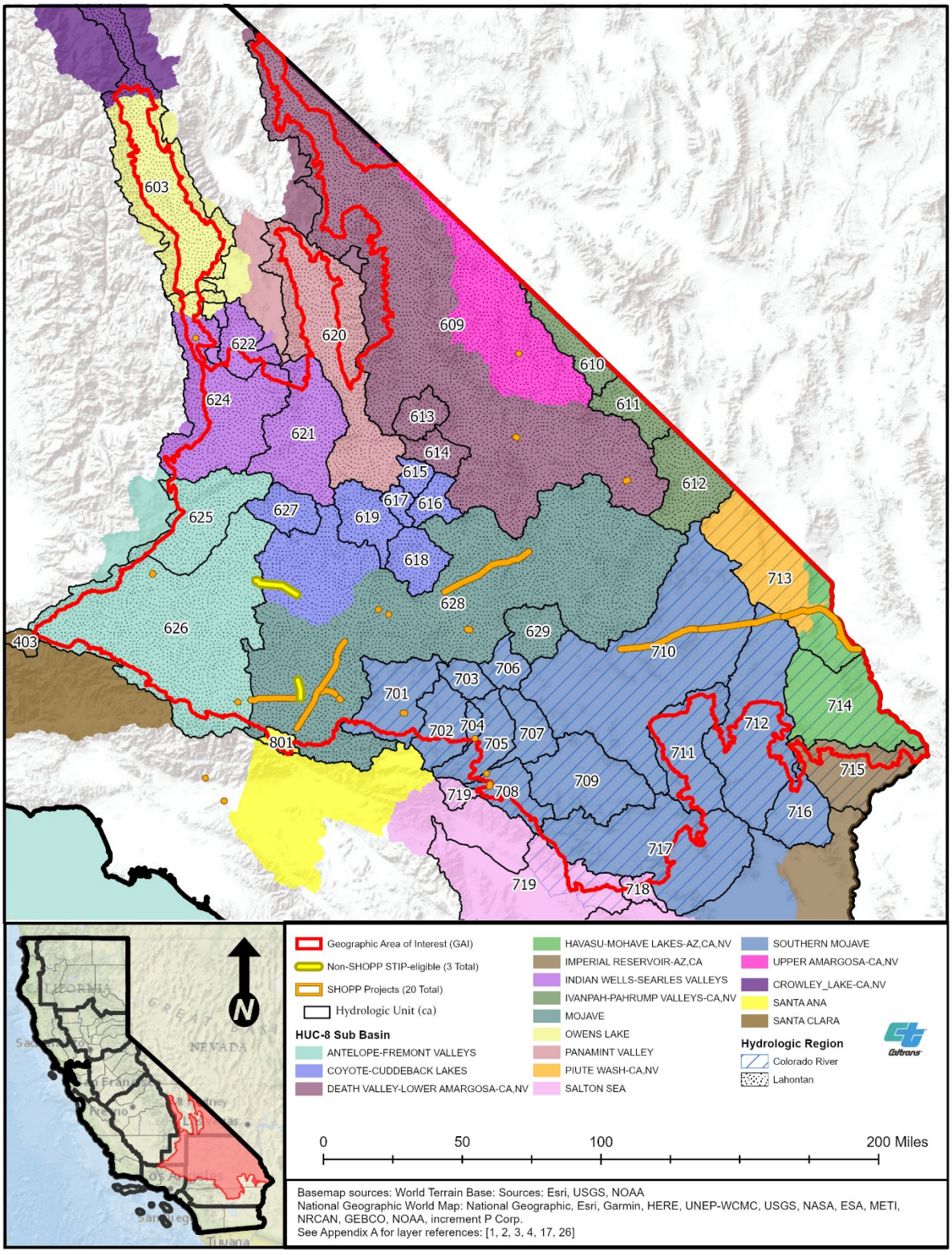
Source: California Department of Water Resources
[a] Numbers were rounded to the nearest whole number.

Table 2-6. Sub-basins in the Colorado River RWQCB within the GAI

Sub-basin Name	Sub-basin Code (HUC-8)	Drainage Area (acres)[a]	Rivers and Streams (count)	Total Reach Length (miles)[a]
Havasu-Mojave Lakes	15030101	649,299	1,262	3,518
Imperial Reservoir	15030104	327,821	2,995	4,504
Piute Wash	15030102	437,789	1,257	2,551
Salton Sea	18100200	850,663	2,584	5,670
Southern Mojave	18100100	5,187,668	8,489	20,844
	Total	**7,453,240**	**16,587**	**37,087**

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

Figure 2-13. HUC-8 Sub-basins and HUs



2.13 Water Quality

Water quality objectives for surface waters and groundwater in the GAI are provided in the *Water Quality Control Plan for the Lahontan Region* (Lahontan RWQCB 2016) and the *Water Quality Control Plan for the Colorado River Basin Region* (Colorado River RWQCB 2019). Water quality objectives identified in the aforementioned plans can be numerical or narrative. For example, 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) address the "chemical constituents" water quality objective for the protection of aquatic life and human health. In contrast, the water quality objective for turbidity is narrative and prohibits changes to turbidity that cause nuisance or an adverse effect on beneficial uses, which are also identified in the basin plans.

The *Water Quality Control Plan for the Lahontan Region* (Lahontan RWQCB 2016) and the *Water Quality Control Plan for the Colorado River Basin Region* (Colorado River RWQCB 2019) also identify beneficial uses for surface waters and groundwater. The beneficial uses identified in these plans are provided in Table 2-7. If it cannot be avoided, beneficial uses may be impacted 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 1995). An example of a beneficial impact would be repairs or retrofits that improve permeability or flows. Hence, this RAMNA considers beneficial uses identified for waterbodies located in the GAI relevant to the RAMNA when they support the preservation and enhancement of wildlife habitat and aquatic resources and are consistent with the AMP's objective to protect natural resources through transportation project mitigation (Table 2-7).

Table 2-7. Beneficial Uses

Beneficial Uses	Colorado River Basin Plan	Lahontan Basin Plan	Relevant to RAMNA?[a]
Agriculture supply	Applicable	Applicable	No
Aquaculture	Applicable	Applicable	No
Cold freshwater habitat	Applicable	Applicable	Yes
Commercial and sport fishing	Not applicable	Applicable	No
Flood peak attenuation/floodwater storage	Not applicable	Applicable	Yes
Freshwater replenishment	Applicable	Applicable	Yes
Groundwater recharge	Applicable	Applicable	Yes
Hydropower generation	Applicable	Applicable	No
Industrial service supply	Applicable	Applicable	No
Inland saline water habitat	Not applicable	Applicable	Yes

Beneficial Uses	Colorado River Basin Plan	Lahontan Basin Plan	Relevant to RAMNA?[a]
Migration of aquatic organisms	Not applicable	Applicable	Yes
Municipal and domestic supply	Applicable	Applicable	No
Navigation	Not applicable	Applicable	No
Non-contact water recreation	Applicable	Applicable	No
Preservation of habitats of special significance	Not applicable	Applicable	Yes
Preservation of rare, threatened, or endangered species	Applicable	Applicable	Yes
Spawning, reproduction, and development	Not applicable	Applicable	Yes
Warm freshwater habitat	Applicable	Applicable	Yes
Water contact recreation	Applicable	Applicable	No
Water quality enhancement	Not applicable	Applicable	Yes
Wildlife habitat	Applicable	Applicable	Yes

Sources: Colorado River RWQCB 2019; Lahontan RWQCB 2016
[a] Beneficial uses relevant to the RAMNA wildlife habitat and aquatic resources, as well as the plant and animal species that depend on them

Further, six waterbodies in the GAI are included on the Section 303(d) list of impaired waters (Colorado River RWQCB 2019; Lahontan RWQCB 2016; State Water Board 2018). This RAMNA considers a waterbody's CWA Section 303(d) impairment designation as relevant to the RAMNA when it is indicative of a waterbody's loss of an aquatic resource related beneficial use. These waterbodies, their impairments, and whether total maximum daily loads (TMDLs) have been established are indicated in Table 2-8. A RWQCB may need to consult with CDFW or other resource agencies to determine whether a beneficial use may be affected by a water quality-related decision.

Table 2-8. Impaired Waters

Impaired Water	Impairment(s)	Total Maximum Daily Load Status	Relevant to RAMNA?[a]
Amargosa River (Nevada border to Tecopa)	Arsenic	Required, not established yet	Yes
Amargosa River (Tecopa to Upper Canyon)	Arsenic	Required, not established yet	Yes
Amargosa River (Willow Creek confluence to Badwater)	Arsenic	Required, not established yet	Yes
Colorado River and Associated Lakes and Reservoirs (California-Nevada border to Lake Havasu Dam)	Toxicity[b]	Required, not established yet	Yes
Colorado River and Associated Lakes and Reservoirs (Lake Havasu Dam to Imperial Dam)	Toxicity	Required, not established yet	Yes
Haiwee Reservoir	Copper	Established	Yes
Mesquite Springs (Inyo County)	Arsenic, boron	Required, not established yet	Yes
Mojave River (Mojave Forks Reservoir outlet to Upper Narrows)	Fluoride	Required, not established yet	Yes
Mojave River (Upper Narrows to Lower Narrows)	Fluoride, sulfates, total dissolved solids	Required, not established yet	Yes
Searles Lake	Salinity/total dissolved solids/ chlorides, total petroleum hydrocarbons	Impairment being addressed by other action	Yes

Sources: Colorado River RWQCB 2019; Lahontan RWQCB 2016; State Water Board 2018
[a] TMDLs relevant to the RAMNA reflect impaired aquatic resource related beneficial uses.
[b] Refers to toxicity to aquatic organisms

2.14 Wild and Scenic Rivers

Rivers designated under the Wild and Scenic Rivers Act of 1968 (16 USC Chapter 28) 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, relatively undeveloped shorelines, and accessible in some places by roads. Recreational river areas include rivers or sections of rivers that are readily accessible by road or railroad, have some development along shorelines, and may have impoundments or diversions. The purpose of the Wild and Scenic Rivers Act is to protect and enhance the wild, scenic, and recreational values of designated rivers (National Wild and Scenic Rivers System 2019).

The Amargosa River is the only free-flowing river in the Death Valley region of the Mojave, and is the only designated wild and scenic river under the Wild and Scenic Rivers Act of 1968 (16 USC Chapter 28) in the GAI (BLM 2009; National Wild and Scenic Rivers System 2019; Omnibus Public Land Management Act of 2009). The location of the Amargosa River is provided on Figure 2-2 and Figure 2-5. The river flows year-round, originating in Nevada and flowing south into Death Valley National Park (National Wild and Scenic Rivers System 2019). On March 30, 2009, Congress designated 7.9 miles of the Amargosa River as wild, 19.6 miles as scenic, and 6.3 miles as recreational as part of the Omnibus Public Land Management Act of 2009. The Amargosa River flows in a part of the Mojave Desert identified as an ACEC by BLM to protect federally listed plants and animals (National Wild and Scenic Rivers System 2019). The section of the Mojave River that flows through the Afton Canyon ACEC Concern is currently considered eligible under the Wild and Scenic Rivers Act (BLM 2005), although it has not yet been formally designated as such.

2.15 Aquatic Resources

Generally speaking, aquatic resources in the GAI include wetlands, waters, and riparian habitats that may be subject to Corps, RWQCB, and/or CDFW regulations, as well as special-status fish managed by the CDFW and FWS. Corps jurisdiction includes any activity that may cause a discharge of dredged or fill material into WOTUS, including wetlands. RWQCB jurisdiction includes any activity that may cause a discharge of waste to waters of the state, including wetlands. CDFW regulates any activity that may divert or obstruct the natural flow of a river, stream, or lake; change the bed, channel, or bank of any river, stream, or lake; use material from any river, stream, or lake; and deposit or dispose of material into any river, stream, or lake. Rivers, streams, and lakes include ephemeral, intermittent, and perennial watercourses. Effects on aquatic resources that occur below the outer limits of riparian vegetation, the top-of-bank on streams/rivers, or normal pool elevation on lakes may be regulated by CDFW. A high-level view of major aquatic resources in the GAI is provided on Figure 2-14, and detailed maps of aquatic resources are provided in Appendix F. The CDFW and FWS manage special-status fish species and regulate activities that may affect these species. These resources are discussed in Section 2.15.3.

2.15.1. Historic

Historically, aquatic resources in the Mojave Desert primarily included the Colorado River, perennial rivers such as the Mojave River, and ephemeral drainages. Beginning in the mid-1800s, Euro-American settlement converted much of the desert for livestock grazing, mining, towns, utility lines and roads, and military bases. In the early 1900s, canals were dug to bring water from the Colorado River to the Imperial Valley for agricultural use and from the Owens River to Los Angeles to support a growing urban population, which resulted in the draining of the limited desert wetlands and habitat fragmentation (Center for Biological Diversity 2019).

2.15.2. Wetlands

Wetland resources in the GAI were excerpted from the SAMNA Reporting Tool, which relies on the FWS National Wetlands Inventory maps (FWS 2017a); and data from the San Francisco Estuary Institute (2018) California Aquatic Resource Inventory (Caltrans 2017d). 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, and provide no information on plant species associated with mapped areas. Though suitable for advance mitigation project scoping, site-specific wetland studies would be required for advance mitigation projects to establish compensatory mitigation credits.

Aquatic resource types outlined herein follow the *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). The SAMNA Reporting Tool wetlands data layer is separate from the land cover types discussed previously in Section 2.5; therefore, total acreages of wetland land cover types presented in Table 2-3 may not align with those presented in Tables 2-9 and 2-10 (Caltrans 2017c, 2017d).

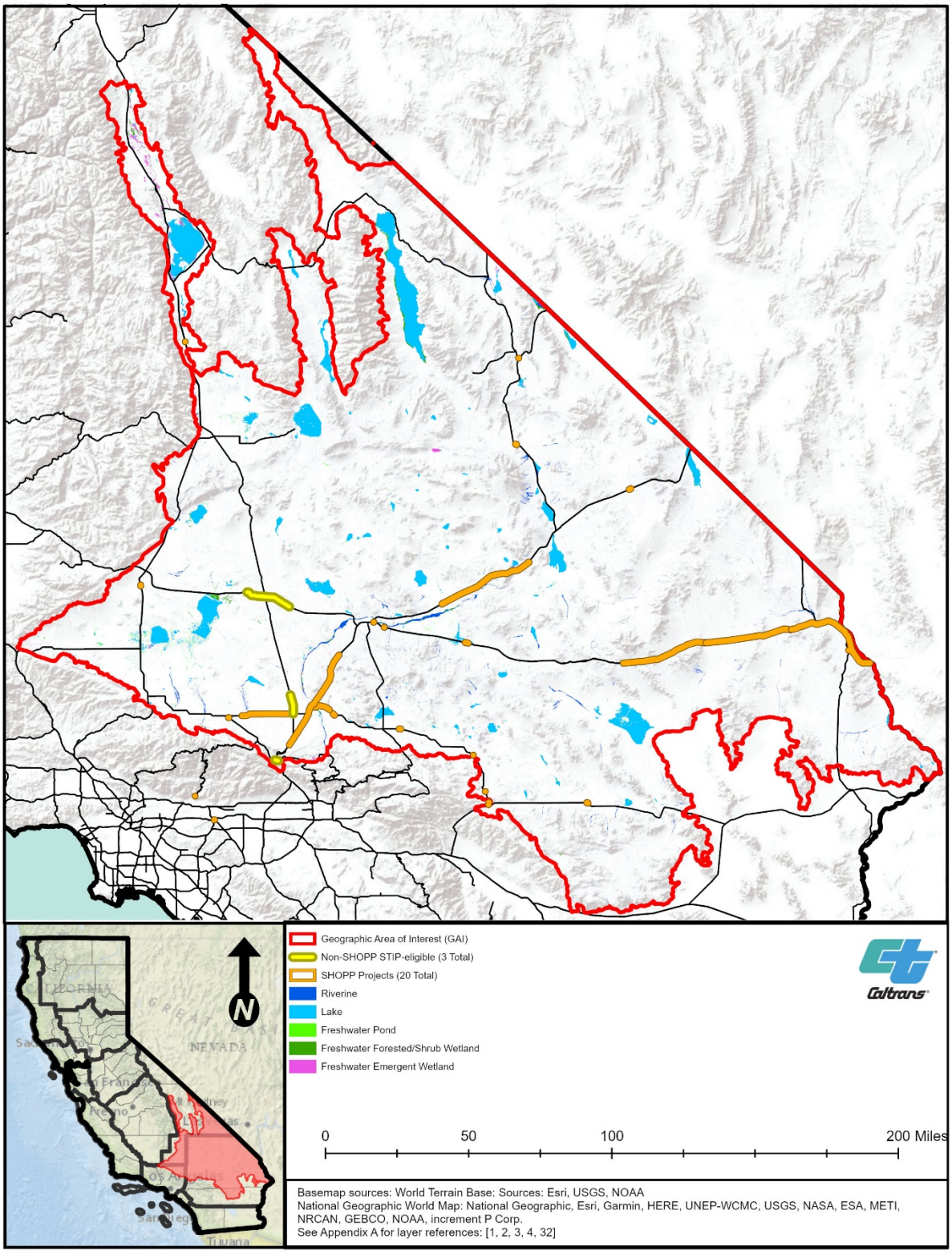
2.15.3. Waters

Water resources in the GAI were excerpted from the SAMNA Reporting Tool, which relies on the USGS National Hydrography Dataset. Though suitable for advance mitigation project scoping, site-specific studies would be required for advance mitigation projects to establish compensatory mitigation credits. Similar to the wetlands data, the waters data layer is separate from the land cover types discussed previously in Section 2.5; therefore, total acreages of water land cover types presented in Table 2-3 may not align with those presented in Tables 2-9 and 2-10 (Caltrans 2017c, 2017d).

2.15.4. Special-Status Fish

Special-status fish species known to occur or with 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 2017e; Caltrans 2018b). Based on a search of the fish habitat layer, one special-status fish species is known to occur or has the potential to occur in the GAI, although it likely only occurs in isolated populations: the federally and state endangered Mohave tui chub. FWS has not designated critical habitat for this species.

Figure 2-14. Major Water Features



This page is intentionally left blank.

Table 2-9. Aquatic Resources in the Lahontan Regional Water Quality Control Board HUC-8 Sub-basins

Type[a]	Antelope-Fremont Valleys (acres) 18090206	Coyote-Cuddeback Lakes (acres) 18090207	Indian Wells-Searles Valleys (acres) 18090205	Ivanpah-Pahrump Valleys (acres) 16060015	Mojave (acres) 18090208	Owens Lake (acres) 18090103	Panamint Valley (acres) 18090204	Death Valley-Lower Amargosa (acres) 18090203	Upper Amargosa (acres) 18090202	Total (acres)
Wetlands	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Depressional Perennial Natural Emergent	Not present	0.00	Not present	Not present	0.16	32.28	Not present	0.00[b]	0.00	**32.44**
Depressional Perennial Natural Forested	Not present	Not present	Not present	Not present	Not present	6.96	Not present	Not present	Not present	**6.96**
Depressional Perennial Natural Non-vegetated	Not present	Not present	Not present	Not present	Not present	12.02	Not present	Not present	Not present	**12.02**
Depressional Perennial Natural Vegetated	0.04	Not present	Not present	Not present	Not present	0.72	Not present	Not present	Not present	**0.76**
Depressional Perennial Non-vegetated	Not present	Not present	Not present	Not present	63.48	Not present	Not present	Not present	Not present	**63.48**
Depressional Perennial Unnatural Emergent	Not present	Not present	Not present	Not present	0.00	20.17	Not present	Not present	Not present	**20.17**
Depressional Perennial Unnatural Non-vegetated	0.60	1.46	0.96	0.07	10.34	25.97	Not present	0.52	Not present	**39.92**
Depressional Perennial Unnatural Shrub-Scrub	Not present	Not present	Not present	Not present	Not present	0.11	Not present	Not present	Not present	**0.11**
Depressional Perennial Unnatural Vegetated	Not present	Not present	Not present	Not present	Not present	0.05	Not present	Not present	Not present	**0.05**
Depressional Seasonal Natural Emergent	13.43	0.88	14.36	0.14	5.40	618.94	0.00	0.00	0.00	**653.15**
Depressional Seasonal Natural Forested	1.24	0.31	0.13	Not present	0.00	17.36	Not present	Not present	0.00	**19.04**
Depressional Seasonal Natural Non-vegetated	2.40	5.63	6.11	Not present	44.52	84.53	0.00	0.00	0.00	**143.19**
Depressional Seasonal Natural Shrub-Scrub	2.67	0.34	1.39	5.17	9.18	30.37	0.00	0.21	0.16	**49.49**
Depressional Seasonal Unnatural Emergent	Not present	Not present	Not present	Not present	Not present	30.52	Not present	Not present	Not present	**30.52**
Depressional Seasonal Unnatural Forested	Not present	Not present	Not present	Not present	Not present	1.03	Not present	Not present	Not present	**1.03**
Depressional Seasonal Unnatural Non-vegetated	4.33	1.29	0.34	0.78	0.17	0.62	Not present	0.03	Not present	**7.56**
Depressional Seasonal Unnatural Shrub-Scrub	0.28	Not present	Not present	Not present	Not present	0.50	Not present	Not present	Not present	**0.78**

Type[a]	Antelope-Fremont Valleys (acres) 18090206	Coyote-Cuddeback Lakes (acres) 18090207	Indian Wells-Searles Valleys (acres) 18090205	Ivanpah-Pahrump Valleys (acres) 16060015	Mojave (acres) 18090208	Owens Lake (acres) 18090103	Panamint Valley (acres) 18090204	Death Valley-Lower Amargosa (acres) 18090203	Upper Amargosa (acres) 18090202	Total (acres)
Depressional Unnatural Non-vegetated	Not present	Not present	Not present	Not present	Not present	0.75	Not present	Not present	Not present	**0.75**
Freshwater Emergent Wetland	66.30	238.48	20.96	2.07	409.64	11,616.06	9.21	135.28	240.72	**12,738.72**
Freshwater Forested/ Shrub Wetland	31.62	63.82	13.43	1,880.78	650.55	4,250.16	36.22	6,212.50	78.26	**13,217.34**
Lacustrine	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Freshwater Pond	304.46	562.75	52.94	23.30	665.74	1,347.30	22.94	146.07	76.74	**3,202.24**
Lacustrine Natural Non-vegetated	120.14	0.27	8.09	11.02	210.13	2,354.52	0.00	0.00	0.00	**2,704.17**
Lacustrine Unnatural Non-vegetated	1.04	Not present	Not present	Not present	0.94	83.41	Not present	Not present	Not present	**85.39**
Lake	3,715.82	27,826.05	135.60	12,615.22	23,799.35	62,005.09	5,307.69	99,350.18	1,860.62	**236,615.62**
Other Aquatic Habitats	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Playa	Not present	Not present	Not present	Not present	29.70	Not present	Not present	Not present	Not present	**29.70**
Riverine	3,627.38	7,073.24	1,917.54	6,495.05	29,601.04	1,710.96	3,684.41	19,568.05	5,157.19	**78,834.86**
Total	**7,891.75**	**35,774.52**	**2,171.85**	**21,033.60**	**55,500.34**	**84,250.40**	**9,060.47**	**125,412.84**	**7,413.69**	**348,509.46**

Sources: Caltrans 2017c, 2017d

Table 2-10. Aquatic Resources in the Colorado River Regional Water Quality Control Board HUC-8 Sub-basins

Type	Havasu-Mojave Lakes (acres) 15030101	Imperial Reservoir (acres) 15030104	Piute Wash (acres) 15030102	Salton Sea (acres) 18100200	Southern Mojave (acres) 18100100	Total (acres)
Wetlands	See below	See below	See below	See below	See below	See below
Depressional Perennial Unnatural Non-vegetated	Not present	Not present	Not present	Not present	0.00[a]	**0.00**
Depressional Seasonal Natural Emergent	Not present	Not present	Not present	Not present	0.00	**0.00**
Depressional Seasonal Natural Forested	Not present	Not present	Not present	0.91	1.09	**2.00**
Depressional Seasonal Natural Shrub-Scrub	Not present	Not present	Not present	0.53	22.51	**23.04**
Depressional Seasonal Unnatural Emergent	Not present	Not present	Not present	0.35	1.16	**1.51**
Depressional Seasonal Unnatural Non-vegetated	Not present	Not present	Not present	Not present	6.33	**6.33**
Depressional Seasonal Unnatural Shrub-Scrub	Not present	Not present	Not present	Not present	0.69	**0.69**
Freshwater Emergent Wetland	0.39	Not present	0.14	0.77	40.19	**41.49**
Freshwater Forested/ Shrub Wetland	6.04	Not present	1.09	16.90	274.47	**298.50**

Type	Havasu-Mojave Lakes (acres) 15030101	Imperial Reservoir (acres) 15030104	Piute Wash (acres) 15030102	Salton Sea (acres) 18100200	Southern Mojave (acres) 18100100	Total (acres)
Lacustrine	See below	See below	See below	See below	See below	See below
Freshwater Pond	13.66	Not present	18.81	Not present	403.78	**436.25**
Lacustrine Natural Non-vegetated	Not present	Not present	Not present	Not present	0.00	**0.00**
Lacustrine Unnatural Non-vegetated	Not present	Not present	Not present	Not present	0.02	**0.02**
Lake	Not present	Not present	Not present	Not present	5,870.92	**5,870.92**
Other Aquatic Habitats	See below	See below	See below	See below	See below	See below
Playa	Not present	Not present	Not present	Not present	370.88	**370.88**
Riverine	7,972.24	1,385.56	9,282.97	1,264.43	32,626.62	**52,531.82**
Total	**7,992.32**	**1,385.56**	**9,303.01**	**1,283.89**	**39,618.65**	**59,583.43**

3. RELEVANT PLANS, POLICIES, AND REGULATIONS

This chapter summarizes the references applicable to the GAI that, when relevant, Caltrans will consult when conceptualizing advance mitigation projects. The table is organized by subject: laws and regulations, statewide and regional resource management plans, plans and permits focused on species of mitigation need, resource agency land management plans (separated by agency), water resources plans and documents, county and city general plans, and nongovernmental organization conservation and management documents. HCPs, NCCPs, and regional conservation investment strategy ("RCIS") documents are discussed separately in Chapter 4 because they represent or support potential current compensatory mitigation 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 in Table 3-1 is not exhaustive. Additional relevant resources may be consulted by Caltrans as advance mitigation planning is conceptualized.

3.1 Relationship to Goals and Objectives

As pointed out in Chapter 1, the GAI for this RAMNA was selected by Caltrans District 8 based on the SAMNA results and other information. District 8 specifically identified compensatory mitigation for the desert tortoise and aquatic resources as a historical and anticipated mitigation need. Hence, Table 3-1 emphasizes documents related to the specified wildlife and aquatic resources, which, in turn, form the basis for the goals and objectives presented in Chapters 7 and 8.

It is expected that any mitigation-related measures to support these specific natural resources in this GAI would benefit other natural resources as well. It is notable that no watershed plans developed in accordance with or consistent with Corps or State Water Board guidance were found.

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
CESA	Updated periodically (by California legislature)	No	Authorizes CDFW to protect State of California listed threatened and endangered species.	https://www.wildlife.ca.gov/Conservation/CESA	9/10/2018 (last amended)
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)
California Water Boards 2010 Update to Strategic Plan 2008–2012	Final	No	Update to strategic plan from the State Water Board and RWQCB. 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
FGC § 1602	Updated periodically (by California legislature)	No	Implemented by CDFW. Regulates activities that may substantially divert or obstruct the natural flow of, or substantially change or use any material from the bed, channel, or bank of, any river, stream, or lake, or deposit or dispose of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake. Effects on aquatic resources that occur below the outer limits of riparian vegetation, the top-of-bank on streams/rivers, or normal pool elevation of lakes, whichever is greater, require a 1602 permit from CDFW.	https://www.wildlife.ca.gov/conservation/lsa	6/27/2017 (last amended)
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	Final	No	Implemented by the State Water Board. 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)
Water Quality Control Plan for the Lahontan Region	Updated periodically	Yes	Implemented by Lahontan RWQCB. Establishes general and site-specific water quality objectives in the Lahontan Basin.	https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/	1/14/2016 (last updated)
Water Quality Control Plan for the Lahontan Region – Beneficial Use Changes for the Mojave River Watershed and Other Minor Revisions	Final	No	Amends the Lahontan Basin Plan to designate additional beneficial uses for three locations along the Mojave River and for Deep Creek and the West Fork Mojave River	https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/mojave_river.html	10/3/2019 (amendment date)
Water Quality Control Plan for the Colorado River Basin 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/coloradoriver/water_issues/programs/basin_planning/	1/8/2019 (last updated)
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
Federal Laws, Guidelines, and Regulations	See below	See below	See below	See below	See below
CWA	Updated periodically (by Congress)	No	Authorized by EPA and delegated to the Corps and State Water Board, 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 the State Water Board. Regulates discharge of pollutants into WOTUS.	https://www.law.cornell.edu/uscode/text/33/1341	12/27/1977 (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 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
National Wetlands Mitigation Action Plan	Final	No	EPA and Corps comprehensive, interagency document to further 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
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
Final 2015 Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division	Final	No	Corps' guidelines for mitigation and monitoring in California.	https://www.spd.usace.army.mil/portals/13/docs/regulatory/mitigation/mitmon.pdf	12/19/2014 (last amended)
Los Angeles District Final Regional Conditions for the 2017 NWP's	Final	No	Corps' regional conditions for Nationwide Permits issued by the Los Angeles District.	https://www.spl.usace.army.mil/Portals/17/docs/regulatory/Permit_Process/FINAL%2017%20SPL%20regional%20conditions.pdf?ver=2017-03-15-140838-737	3/15/2017
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)
40 CFR 131.12 California Anti-degradation Policy	Final	No	Implemented by the State Water Board. Required by federal law, the Anti-degradation 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)
303(d) List of Impaired Water Bodies	Final	No	EPA and the State Water Board's listing of regulated impaired water bodies.	https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml	4/11/2018 (last updated)
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
The John D. Dingell, Jr. Conservation, Management, and Recreation Act of 2019 (S 47) Part V, Section 1457	Final	No	Designates an additional 7.5 miles of the Amargosa River as a scenic river. Establishes a Mojave Desert Tortoise Conservation Center on the California Nevada border.	https://www.congress.gov/116/plaws/publ9/PLAW-116publ9.pdf	3/12/2019
Statewide and Regional Resource Planning Documents	See below	See below	See below	See below	See below
State Wildlife Action Plan ("SWAP")	Updated periodically (5-year intervals)	Yes	CDFW's plan for protection of species of greatest conservation need, in addition to habitats and other wildlife in California.	https://www.wildlife.ca.gov/SWAP/Final	9/1/2015

Title	Status	Spatial Data	Reference Purpose	Link	Date
SWAP 2015 Transportation Companion Plan	Final	Yes	CDFW's companion document to SWAP for protection of species specific to transportation project planning.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=136128&inline	12/1/2016
Climate Change Vulnerability Assessment	Final	Yes	CDFW's companion document to SWAP to assess the vulnerability of habitats to projected end-of-century climates in California.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=116208&inline	1/1/2016
Water Management Companion Plan	Final	Yes	CDFW's companion document to SWAP to recommend water management practices throughout the state of California.	https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=136130&inline	12/1/2016
CEHC 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
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 Wildlife Barriers 2020	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 like big horn sheep.	http://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178511	3/1/2020
Large Mammal-Vehicle Collision Hot Spot Analyses, California, USA	Final	Yes	Western Transportation Institutes' 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
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.	http://www.cwam.ucdavis.edu/Manual_chapters.htm	5/1/2005
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
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
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
Wildlife Conservation Board Strategic Plan Update 2019-2024	Final	No	A strategic plan for the Wildlife Conservation Board to acquire and restore habitat in California. Includes objectives to acquire and/or restore property in alignment with SWAP, the California Water Action Plan, regional RCIS's and NCCP's	https://wcb.ca.gov/About/Strategic-Plan	9/1/2019
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

Title	Status	Spatial Data	Reference Purpose	Link	Date
Special-status Taxa[a] Documents	See below	See below	See below	See below	See below
Revised Recovery Plan for the Mojave Population of the Desert Tortoise	Final	Yes	FWS' recovery plan for desert tortoise. The recovery criteria for Mojave desert tortoise include: increasing rates of population change over at least 25 years, ensuring that these increasing rates occur in each recovery unit, and maintaining total habitat in each conservation area with no net loss. Critical habitat is established for this species, and a USGS habitat model for this species also exists. Five recovery units occur in California.	https://ecos.fws.gov/docs/recovery_plan/RRP%20for%20the%20Mojave%20Desert%20Tortoise%20-%20May%202011_1.pdf	5/6/2011
Mojave Population of the Desert Tortoise 5-Year Review: Summary and Evaluation	Updated periodically (5-year intervals)	Yes	FWS' most recent formal review of the species condition.	https://ecos.fws.gov/docs/five_year_review/doc3572.pdf	9/30/2010
Biological Opinion for the Desert Renewable Energy Conservation Plan Final Environmental Impact Statement and Land Use Plan Amendment	Final	No	Under the DRECP LUPA, the BLM manages public lands within the CDCA. At the time of FWS' previous consultations on the CDCA Plan, the BLM managed public lands in the CDCA according to four multiple-use classes (controlled, limited, moderate, intensive) and a relatively small amount of unclassified land. In the DRECP LUPA, the BLM identifies land uses that further refine the existing elements (e.g., cultural resources, Native American resources, wildlife, etc.). In the biological opinion, the FWS concluded that the BLM's proposed action, to adopt a land use plan amendment that covers two primary actions, the designation of lands suitable or potentially suitable for renewable energy development and the alteration of its land use allocations was not likely to result in jeopardizing the continued existence of listed species in the planning area or result in the destruction or adverse modification of critical habitat. The biological opinion also concludes, in part, that the BLM's proposed action would benefit listed species and does not impose any land management mandates on BLM. The biological opinion also expresses FWS' opinion that 88 desert tortoises occur in the 11,290 acres of proposed renewable energy development and has authorized take of 22 of them for plan activities without needing further consultation. Conservation and management actions included with the DRECP LUPA that are pertinent to this RAMNA and included in Appendix 2 of the biological opinion include the following; • Maintain the following linkage and connectivity areas: o 5 mile wide linkage across I-10 centered on Wiley's Well Road connecting Mule and McCoy Mountains. o 3 mile wide linkage across I-10 to connect the Chuckwalla and Palen Mountains. o 1.5 mile wide linkage across I-10 to connect the Chuckwalla Mountains to the Chuckwalla Valley east of Desert Center. o The confluence of Milpitas Wash and the Colorado River floodplain within 2 miles of SR-78. • Maintain avoidance setbacks of 200 feet from any vegetation type identified as Madrean warm semi-desert wash woodland/scrub, Mojavean semi-desert wash scrub, Sonoran-Coloradan semi-desert wash woodland/scrub, and undifferentiated riparian land cover. • Maintain avoidance setbacks of 0.25 mile from any vegetation type identified as southwestern North American riparian evergreen and deciduous woodland, southwestern North American riparian/wash scrub, arid west freshwater emergent marsh, California warm temperate marsh/seep, managed wetlands, and Mojave River. • Maintain hydrologic function of the following vegetation types, North American warm desert alkaline scrub and herb playa and wet flat, southwestern North American salt basin and high marsh, and other undifferentiated wetland-related land covers such as playa, wetland, and open water. • Impact mitigation ratios are set in the following manner: o Desert tortoise critical habitat – 5:1 o Wetlands – 2:1 o Desert riparian woodland vegetation types – 5:1	Provided as Appendix 3 to the DRECP LUPA. https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=95675	9/14/2016

Title	Status	Spatial Data	Reference Purpose	Link	Date
Biological Opinion for the West Mojave Route Network Project, San Bernardino, Inyo, Kern, Riverside, and Los Angeles Counties, California	Final	No	In the biological opinion, the FWS concluded that the BLM's proposed action (i.e., adoption of plan- and implementation-level decisions with regard to the route network) was not likely to jeopardize the continued existence of listed species in the planning area or result in the destruction or adverse modification of critical habitat. The biological opinion also concludes, in part, that the BLM's proposed action would benefit listed species and does not impose any land management mandates on BLM.	https://eplanning.blm.gov/epl-front-office/projects/nepa/93521/20005052/250005924/WMRNP_ROD_Appendix_A_Biological_Opinion.pdf	9/30/2019
Biological Opinion for Highway Improvements, Maintenance Activities, and Safety Projects in Imperial, Inyo, Kern, Los Angeles, Riverside, and San Bernardino Counties, California	In progress	No	In this ongoing consultation, the FWS will undertake a programmatic and broad review of future Caltrans activities with regard to the desert tortoise with the goal of improving the efficiency of the consultation process and improving on-the-ground coordination with CDFW. The biological opinion will also discuss how Caltrans plans to implement its obligations with regard to Section 7(a)(1) of the Federal Endangered Species Act.	Not publicly available	Pending
Biological Opinions for Desert Tortoise	Final	No	FWS' list of the 57 biological opinions that have been issued for desert tortoise, of which 9 were written for projects in the GAI.	https://ecos.fws.gov/ecp0/profile/speciesProfile?sId=4481	2/26/2018 (latest document)
A petition to the State of California Fish and Game Commission to change the status of Desert Tortoise from Threatened to Endangered	Final	No	A petition from 4 non-government organizations to change the California Endangered Species Act status from Threatened to Endangered. Includes a review of species condition.	https://fgc.ca.gov/CESA#adt	3/11/2020
Incidental Take Permits for Desert Tortoise	Final	No	CDFW's list of incidental take permits issued for desert tortoise. Since 2005 a total of 13 permits have been issued along with 7 amendments.	https://nrm.dfg.ca.gov/documents/docviewer.aspx	10/21/2019 (latest document)
Federal Register Determination of Critical Habitat for the Mojave Population of the Desert Tortoise	Final	No	Designation of critical habitat for the desert tortoise.	https://ecos.fws.gov/docs/federal_register/fr2519.pdf	2/8/1994
State Land Management Plans	See below	See below	See below	See below	See below
General Planning Handbook for California State Parks	Final	Yes	California State Parks' guidelines for general plan development, which requires an inventory of known natural resources and general guidelines to comply with federal and state laws.	http://www.parks.ca.gov/pages/21299/files/planning_handbook_april_2010.pdf	4/1/2010
Red Rock Canyon State Park General Plan	In progress	Yes	General plan for the Red Rock Canyon State Park.	http://www.parks.ca.gov/?page_id=25064	Red Rock Canyon State Park General Plan
FWS Land Management Plans	See below	See below	See below	See below	See below
Havasu National Wildlife Refuge Comprehensive Conservation Plan	Not publicly available	Unknown	Management plan for Havasu National Wildlife Refuge.	Link currently broken; document cannot be downloaded and is not otherwise publicly available.	Unknown
U.S. Military Land Management Plans	See below	See below	See below	See below	See below
Marine Corps Air Ground Combat Center Twentynine Palms – Integrated Natural Resources Management Plan	Final	Yes	U.S. Marine Corps plan for managing natural resources on the base, including desert tortoise.	https://www.29palms.marines.mil/Portals/56/Docs/Environmental%20Affairs/Integrated_Natural_Resources_Management_Plan%20Fiscal_Years_2018_through_2022.pdf	1/1/2018
Naval Air Weapons Station China Lake Environmental Policy	Final	Yes	U.S. Navy plan for environmental protection on the base, including land use.	https://www.cnic.navy.mil/content/dam/cnic/cnrsw/NAWSCL/pdf/2016%20NAWSCL%20Environmental%20Policy.pdf	2/24/2016

Title	Status	Spatial Data	Reference Purpose	Link	Date
Fort Irwin Environmental Sustainability Management System	Not publicly available	Unknown	U.S. Army plan for environmental management of the base.	Unknown	Unknown
Edwards Air Force Base Environmental Management System	Not publicly available	Unknown	U.S. Air Force plan for environmental management of the base.	Unknown	Unknown
USFS Land Management Plans	See below	See below	See below	See below	See below
Land Management Plan for the Inyo National Forest	Final	Yes	Management plan to guide all resource management activities in the national forest.	https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fseprd589652.pdf	1/1/2018
Southern CA National Forests Vision	Final	Yes	Provides an overall strategy for land management in San Bernardino and Angeles National Forests.	https://www.fs.usda.gov/main/sbnf/landmanagement/planning	9/1/2005
Angeles National Forest Management Plan	Final	Yes	Management plan to guide all resource management activities in the national forest.	https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/stelprdb5166877.pdf	9/1/2005
San Bernardino National Forest Strategy	Final	Yes	Management plan to guide all resource management activities in the national forest.	https://www.fs.usda.gov/Internet/FSE_DOCUMENTS/fsbdev7_007719.pdf	9/1/2005
BLM Land Management Plans	See below	See below	See below	See below	See below
California Desert Conservation Area Plan of 1980 and Amendments	Final	Yes	The 1980 California Desert Conservation Area (CDCA) Plan and its 168 Amendments guide management of the 9.4 million-acre CDCA. Detailed resource management plans exist for specific regions in the GAI including the Northern and Eastern Mojave, Northern and Eastern Colorado, Coachella Valley, and West Mojave. This plan has been most recently amended and incorporated with the Desert Renewable Energy Conservation Plan Land Use Plan Amendment.	https://archive.org/details/californiadesert00unse https://eplanning.blm.gov/ https://landscape.blm.gov/geoportal/catalog/BLMNational/BLMNational.page	1980 and thereafter
Desert Renewable Energy Conservation Plan Land Use Plan Amendment	Final	Yes	Desert Renewable Energy Conservation Plan (DRECP) Land Use Plan Amendment (LUPA) is the latest amendment to the CDCA Plan and BLM's current management plan for the area. It amended the Bishop and Bakersfield Resource Management Plans in the Mojave and Colorado/Sonoran Desert regions of southern California. Under the LUPA, the BLM manages public lands in the CDCA with land use allocations, replacing the previous multiple-use classes. BLM has designated a total of 133 Areas of Critical Environmental Concern (ACEC) in California, some of which do not occur on BLM land. A total of 91 ACEC's occur in the GAI, 89 of which are administered through the DRECP. Each of these ACEC's has unique objectives, allowable uses, management actions, and disturbance allowances, many of which are directed toward desert tortoise or aquatic resources.	https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=95675	9/14/2016
West Mojave Plan CDCA Amendment	Final	Yes	An amendment to the CDCA Plan and relevant to the GAI. Includes a goal to establish a Desert Wildlife Habitat Area.	https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=72544&dctmId=0b0003e880e36812	12/1/2004
The Northern and Eastern Mojave RMP Amendment	Final	Yes	An amendment to the CDCA Plan and relevant to the GAI. Includes a goal to establish 3 ACEC's for desert tortoise.	https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=renderDefaultPlanOrProjectSite&projectId=73191&dctmId=0b0003e880e37063	7/1/2002

Title	Status	Spatial Data	Reference Purpose	Link	Date
Northern and Eastern Colorado Coordinated Management Plan	Final	Yes	An amendment to the CDCA Plan and relevant to the GAI. Includes a goal to establish an ACEC for desert tortoise.	https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=96990	7/1/2002
Proposed CDCA Plan Amendment for the Coachella Valley	Final	Yes	An amendment to the CDCA Plan with minor overlap with the GAI.	https://eplanning.blm.gov/epl-front-office/eplanning/planAndProjectSite.do?methodName=dispatchToPatternPage&currentPageId=96939	10/7/2002
West Mojave Route Network Project Draft California Desert Conservation Plan	Draft	No	Planning and management of transportation, travel, and livestock grazing on BLM lands.	https://eplanning.blm.gov/epl-front-office/projects/nepa/93521/137935/169703/West_Mojave_Route_Network_Project_Draft_Supplemental_Environmental_Impact_Statement_508.pdf	1/1/2018 (draft version)
West Mojave Route Network Project Supplemental Environmental Impact Statement	Final	Yes	The BLM's West Mojave Plan was updated and finalized in 2019 with the West Mojave Route Network Project. It addresses planning and management of transportation, travel, and livestock grazing on 3.1 million acres of BLM lands within the 9.4 million-acre CDCA. The project (1) provides north-south and east-west connectivity, consistency across jurisdictional boundaries, and increased access to recreation areas, lands of other ownership, mines, points of interest and authorized facilities such as powerlines and livestock water; (2) addresses the need for public, authorized, and administrative access to and across BLM-managed lands, including motorized, non-motorized and non-mechanized modes of travel; (3) eliminates parallel and redundant routes and allows restoration to address use impacts and improve resource conditions, including habitat for FESA listed species; and (4) retains access to existing camping and staging areas along designated routes.	https://eplanning.blm.gov/epl-front-office/projects/nepa/93521/137935/169703/West_Mojave_Route_Network_Project_Draft_Supplemental_Environmental_Impact_Statement_508.pdf	10/3/2019
BLM Bishop Resource Management Plan	Final	Yes	Management direction of BLM lands in the Bishop District.	https://eplanning.blm.gov/epl-front-office/projects/lup/70447/92777/111784/Bishop_RMP_ROD_1993_w_app_glossary_508.pdf	4/1/1993
BLM Bakersfield Resource Management Plan	Final	Yes	Management direction of BLM lands in the Bakersfield District.	https://eplanning.blm.gov/epl-front-office/projects/lup/70273/92254/111143/Bakersfield_ROD-ARMP.pdf	12/1/2014
BLM Amargosa Wild and Scenic River Management Plan	In litigation	No	Management direction of BLM lands in the resource area.	Not publicly available	Not filed pending litigation
National Park Service Land Management Plans	See below	See below	See below	See below	See below
Mojave National Preserve General Management Plan	Final	Yes	Management plan for the Mojave National Preserve. This plan also covers land use in the Providence Mountains State Recreation Area, CDFW-owned Piute Springs, and the Granite Mountains Natural Reserve owned by UC.	https://www.nps.gov/moja/learn/management/gmp.htm	4/1/2002
Death Valley General Management Plan	Final	Yes	Management plan for Death Valley National Park.	https://www.nps.gov/deva/learn/management/upload/GMP_001.pdf	4/1/2002
Saline Valley Warm Springs Management Plan	Draft	No	Management plan for the Saline Valley Warm Springs portion of Death Valley National Park.	https://parkplanning.nps.gov/document.cfm?parkID=297&projectID=39438&documentID=87550	5/4/2018 (draft form)

Title	Status	Spatial Data	Reference Purpose	Link	Date
Manzanar National Historic Site Management Plan	Final	No	Management plan for Manzanar National Historic Site.	https://www.nps.gov/manz/learn/management/general-management-plan.htm	8/1/1996
Joshua Tree National Park Management Plan	Final	No	Management plan for Joshua Tree National Park.	https://www.nps.gov/jotr/learn/management/index.htm	8/7/1995
Water Resource Plans and Documents	See below	See below	See below	See below	See below
Mojave Region Integrated Regional Water Management Plan	Final	Yes	Mojave Regional Water Management Group's, a consortium of five agencies, management plan for water resources in approximately the western 1/3rd of the desert region of San Bernardino County.	https://www.mywaterplan.com/irwm-plan-documents.html	5/25/2018 (as amended)
Local Government Land Management Plans	See below	See below	See below	See below	See below
Lower Owens River Project Monitoring, Adaptive Management and Reporting Plan	Final	Yes	Los Angeles Department of Water and Power and Inyo County Water Departments' management plan related to the Lower Owens River Project.	www.inyowater.org/wp-content/uploads/2014/04/LORP_MonitoringAdaptiveManagmentPlan_042808_Print_Small.pdf	4/28/2008
Adelanto North Sustainable Plan	Final	No	Sustainability plan for the northern portion of Adelanto.	https://www.ci.adelanto.ca.us/DocumentCenter/View/623/Adelanto-North-2035-Sustainable-Plan	8/27/2014
Status and Management of Shoshone Pupfish at Shoshone Spring, Inyo County, California	Final	No	FWS and UC Davis document detailing status and management of Shoshone pupfish on State of California land in Shoshone Springs.	http://www.nativefishlab.net/library/textpdf/16054.pdf	1/1/1990
County General Plans	See below	See below	See below	See below	See below
Riverside General Plan	Final	Yes	Includes land use maps for open space in the following categories: conservation, conservation habitat, open space recreation, open space rural, mineral resources, and water.	https://planning.rctlma.org/ZoningInformation/GeneralPlan.aspx	7/17/2018
Los Angeles General Plan	Final	Yes	Includes land use maps for natural resources in the following categories: conservation, parks and recreation, national forest, BLM, water, mineral resources, and military.	http://planning.lacounty.gov/generalplan/generalplan	10/6/2015
San Bernardino General Plan	Final (update in progress)	Yes	Includes land use maps with resource/land management and open space categories.	http://cms.sbcounty.gov/lus/planning/generalplan.aspx	4/24/2014
San Bernardino General Plan	Final (update in progress)	Yes	Land use map for general plan.	http://countywideplan.com/wp-content/uploads/2018/08/Proposed-Land-Use-Map-36x48-180820.pdf	4/24/2014
Kern General Plan	Final (update in progress)	Yes	Includes zoning for resource reserve and resource management.	https://kernplanning.com/planning/planning-documents/general-plans-elements/	9/22/2009
City General Plans	See below	See below	See below	See below	See below
City of Adelanto General Plan	Final	Yes	Includes zoning for open space, in Chapter 5: Open Space and Conservation.	https://www.ci.adelanto.ca.us/352/City-of-Adelanto-General-Plan	1/18/2018
City of Hesperia General Plan	Final	Yes	Includes land use designations of parks and recreation as well as resource conservation.	https://www.cityofhesperia.us/409/Hesperia-General-Plan	8/15/2017
Oak Hills Community Plan	Final	Yes	Community plan for Oaks Hills, a subset of Hesperia. Includes conservation and open space elements that are general in nature, but no zoning or land use designations.	http://www.sbcounty.gov/Uploads/lus/CommunityPlans/OakHillsCP.pdf	6/18/2013

Title	Status	Spatial Data	Reference Purpose	Link	Date
City of Barstow General Plan	Final	Yes	Includes land use designations for interim open space/resource conservation and resource conservation open space.	http://www.barstowca.org/city-hall/city-departments/community-development-department/planning/draft-general-plan-and-master-environmental-impact-report	7/20/2015
Town of Apple Valley General Plan	Final	Yes	Includes land use designations of open space and conservation. Identifies open space areas that should be considered for the preservation of natural resources which include riparian areas along the Mojave River, wildlife preservation areas associated with the Mojave River, and ephemeral streams.	https://www.applevalley.org/services/planning-division/2009-general-plan	8/11/2009
Town of Yucca Valley General Plan	Final	Yes	Includes land use designations for open space – conservation and open space – recreation.	http://www.yucca-valley.org/departments/gpu.html	2/4/2014
City of Ridgecrest General Plan	Final	Yes	Includes zoning for parks and open space.	https://ridgecrest-ca.gov/uploadedfiles/Departments/Public_Services/Planning_Department/General%20Plan%202030.pdf	12/2/2009
City of California City General Plan	Final	Yes	Includes a land use designation of conservation land.	https://www.californiacity-ca.gov/CC/index.php/planning/planning-publications	10/6/2009
City of Lancaster General Plan	Final	Yes	Includes a land use category of open space.	https://www.cityoflancasterca.org/home/showdocument?id=9323	7/14/2009
City of Victorville General Plan	Final	Yes	Includes a land use category of open space.	https://www.victorvilleca.gov/government/city-departments/development/planning/general-plan	10/21/2008
City of Palmdale General Plan	Final	Yes	Includes a land use category of open space.	http://www.cityofpalmdale.org/Businesses/Economic-and-Community-Dev/Planning-and-Zoning/General-Plan	1/25/1993
City of Palmdale Zoning Map	Final	Yes	Zoning map for Palmdale.	https://cityofpalmdale.org/Portals/0/Documents/Maps/10-06-2014_GIS_00041-02_LandUse.pdf	1/25/1993
City of Needles General Plan	Final	Yes	Includes zoning for open space.	http://www.cityofneedles.com/Pages/Departments-Services/Development/Planning.html	2/18/1986
Nongovernmental Organization Conservation and Management Documents	See below	See below	See below	See below	See below
Mojave Desert Ecoregional Assessment	Final	No	The Nature Conservancy's 2010 assessment of the distribution of biodiversity conservation values across the GAI to guide development away from and direct conservation actions toward lands of high conservation value.	https://www.scienceforconservation.org/assets/downloads/Mojave_Desert_Ecoregional_Assessment_2010.pdf	9/1/2010
California Regional Conservation Assessment	In progress	No	The Conservation Biology Institute's assessment of habitat connectivity and areas of conservation priority for the West Mojave region. Focal species include desert tortoise and Mohave ground squirrel.	https://consbio.org/products/projects/california-RCA	3/1/2019
Morongo Basin Conservation Priorities Report	Final	Yes	A Sonoran Institute report that designates conservation priorities in the Morongo Basin.	https://sonoraninstitute.org/files/pdf/morongo-basin-conservation-priorities-report-a-strategy-for-preserving-conservation-values-07112012.pdf	1/1/2012

Title	Status	Spatial Data	Reference Purpose	Link	Date
A Linkage Network for the California Deserts	Final	Yes	An SC Wildlands report that identifies and prioritizes linkage networks in California deserts.	www.scwildlands.org/reports/ALinkageNetworkForTheCaliforniaDeserts.pdf	2/1/2012
A Linkage Design for the Joshua Tree – Twentynine Palms Connection	Final	Yes	An SC Wildlands guideline for linking habitats between Joshua Tree National Park and Twentynine Palms Marine Corps Base.	http://www.scwildlands.org/reports/JT_TP_Connection.pdf	12/1/2008

[a] Consistent with the Caltrans SAMNA and Chapter 4, for the purposes of this document, special-status species include 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); or California Rare Plant Rank 1 and 2 species.

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 compensatory mitigation credits (or similar) currently available to Caltrans and/or pending through existing HCPs, NCCPs, mitigation and conservation banks, and mitigation credit agreements ("MCAs"). RCISs, which are prerequisite for MCAs, are also discussed. Caltrans begins the chapter by describing the advance mitigation credits already held by Caltrans District 8.

4.1 SHOPP Advance Mitigation Credits

The 2016 SHOPP, with CTC 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 projects. Twelve advance mitigation projects were programmed in the SHOPP and are underway; however, none are located with the GAI.

4.2 HCPs and NCCPs

HCPs[1] and NCCPs[2] are planning documents required to obtain incidental take permits that authorize take of federal and/or state endangered species that is incidental to otherwise lawful activities, which are deemed "covered activities" under an HCP and/or NCCP. Covered activities consist of specified projects and activities that may have direct or indirect effects on the covered species and natural communities and for which a permittee requests take authorization. Consequently, for covered activities, an approved HCP/NCCP may guide streamlined species permitting at the local level that is consistent with the plans. When Caltrans is not an HCP and/or NCCP permittee, under specific conditions and with signatory agency approval, Caltrans may be able to qualify as a Participating Special Entity under an HCP/NCCP, gaining some of the permittee's privileges.

Caltrans identified the following active and/or pending HCP/NCCPs in the GAI that apply to transportation-related activities and that Caltrans may be able to use to meet its compensatory mitigation needs for the GAI:

- Apple Valley Multi-Species HCP/NCCP (in progress)
- Coachella Valley Multiple Species HCP/NCCP
- Lower Colorado River Multi-Species Conservation Program HCP
- West Mojave Plan HCP

Signatory agencies, status, area, transportation agency permittees, covered species, covered communities, and covered activities are summarized in Table 4-1. Multiple

[1] Pursuant to ESA § 10 or consultations under ESA § 7
[2] FGC § 2835

project-specific HCPs in the GAI were not included in Table 4-1 because they were determined to not provide a viable advance mitigation option for Caltrans. For example, covered activities were not road infrastructure related, nor could they be adapted to be applicable to road infrastructure. The HCPs that are included in Table 4-1 cover a large geographic area that intersects with many planned Caltrans projects. Figure 4-1 depicts the locations of the Apple Valley Multi-Species HCP/NCCP and Coachella Valley Multiple Species HCP/NCCP. The Lower Colorado River Multi-Species Conservation Program HCP and West Mojave Plan HCP are not included on this figure, as their service area data are not publicly available.

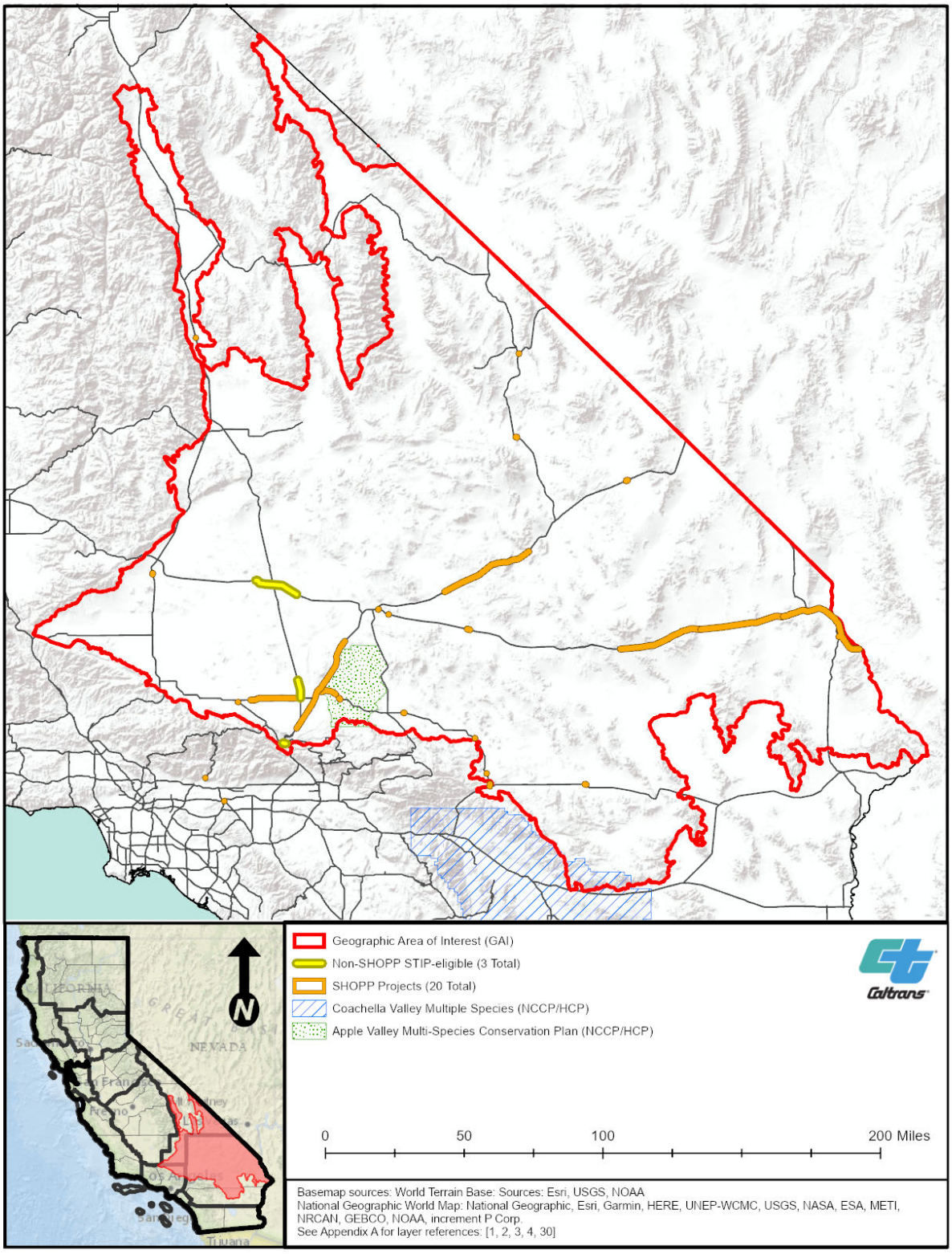
It is notable that, although the DRECP was originally developed by multiple agencies as an HCP, NCCP, and BLM land use plan, the HCP and NCCP components were not pursued. Nevertheless, information and data collected for the DRECP were used to inform the foundational biological components of the Antelope Valley RCIS (Desert and Mountain Conservation Authority 2017). The Antelope Valley RCIS is discussed in Section 4.5, below.

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

Name	Signatories[b]	Date	Area (acres)	Transportation Agency Permittees	Covered Species	Covered Natural Communities	Transportation-related Covered Activities
Apple Valley Multi-Species HCP/NCCP	**FWS** **CDFW** BLM Town of Apple Valley San Bernardino County	In progress	222,369	San Bernardino County	Desert tortoise plus 8 additional covered species	8 natural communities	Public review draft in process
Coachella Valley Multiple Species HCP/NCCP	**FWS** **CDFW**	2008 (last amended in 2016)	240,000	Caltrans	27 species	23 natural communities	Caltrans-specific and other transportation projects are listed in Tables 7-1 to 7-3 of the HCP/NCCP.
Lower Colorado River Multi-Species Conservation Program HCP	BLM **FWS**	2005	Planning area not defined in terms of acres[c]	None	Desert tortoise plus 149 other special-status species	None	Operations, maintenance, and replacement of access and service roads to existing water diversion and conveyance facilities.
West Mojave Plan HCP	BLM **FWS**	2005	9,359,070	Caltrans	Desert tortoise plus 3 other reptiles, 16 bird, 5 mammal, and 24 plant species	None	Caltrans projects are covered activities under the plan.

[a] Up-to-date information on HCPs and NCCPs can be found at: https://ecos.fws.gov/ecp0/conservationPlan/region/summary?region=8&type=HCP
[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] The Lower Colorado River Multi-Species Conservation Program HCP planning area encompasses areas up to and including the full-pool elevations of Lakes Mead, Mohave, and Havasu and the historical floodplain of the Colorado River from Lake Mead to the southern international boundary.

Figure 4-1. HCPs and NCCPs



4.3 Mitigation and Conservation Banks

A conservation or mitigation bank is privately or publicly owned land managed for its natural resource values. In exchange for permanently protecting, managing, and monitoring the land, the bank sponsor is allowed to sell or transfer habitat and/or aquatic resource credits to permittees who,—after all appropriate and practicable avoidance and minimization has been performed—need to satisfy legal requirements and compensate for their project's unavoidable environmental impacts. While both conservation and mitigation banks can provide credits for species habitat and aquatic resources, generally speaking, conservation banks are designed primarily for the protection of threatened and endangered species habitat. Mitigation banks, on the other hand, are generally designed to 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 the following active or pending mitigation and/or conservation banks with service areas that overlap all or part of the GAI. While the service areas of these banks do overlap the GAI, they do not necessarily provide compensatory mitigation credits for Caltrans species or aquatic resources of mitigation need. Additionally, while the service areas for the Cajon Creek and Lytle Creek conservation banks overlap the GAI, the species and habitat compensatory mitigation credits available at these banks are not found in the Mojave Desert ecoregion and, therefore, should not be considered as compensatory mitigation for transportation-related impacts that occur in the GAI.

- Black Mountain Conservation Bank
- Cajon Creek Habitat Conservation Management Area, a conservation bank
- Chiquita Canyon Conservation Bank
- Fenner Valley Desert Tortoise Conservation Bank (pending – has not yet met criteria to be fully established)
- Lytle Creek Conservation Bank (pending)
- Mojave Desert Tortoise Umbrella Conservation Bank
- Mojave River Watershed Mitigation Bank (pending)
- Petersen Ranch Mitigation Bank
- West Mojave Conservation Bank

Information on the resource and regulatory agency approvals, the types of credits available, and brief descriptions of each bank are provided in Table 4-2.The location and extent of the service areas associated with the aforementioned banks are depicted on Figures 4-2, 4-3, 4-4, and 4-5. It is notable that, per CDFW discretion, all impacts on desert tortoise within Los Angeles County must be mitigated within the county and within the same watershed where the impacts occur (CDFW 2020a).

Table 4-2. Overview of Mitigation Banks, Conservation Banks, and In-lieu Fee Programs in the GAI[a]

Name	Year Approved	Signatories[b]	Area (acres)	Location	Credit types
Black Mountain Conservation Bank	2018[c]	**CDFW**	1,940	See Figure 4-2.	Desert tortoise, Mohave ground squirrel (*Xerospermophilus mohavensis*), and waters of the state (streams). Potential for burrowing owl and Golden eagle, as well.
Cajon Creek Habitat Conservation Management Area	1996	**CDFW**	1,300	No service areas because mitigation is decided on case-by-case basis, usually for San Bernardino County.	San Bernardino kangaroo rat (*Dipodomys merriami parvus*), Santa Ana woolly star (*Eriastrum densifolium*), slender-horned spineflower (*Dodecahema leptoceras*), Riversidean alluvial fan sage scrub and associated threatened and endangered species
Chiquita Canyon Conservation Bank	1996	**FWS**	1,182	See Figure 4-5.	California gnatcatcher (*Polioptila californica*), Coastal sage scrub, and Riversidean sage scrub
Coachella Valley Clean Water Act In-Lieu Fee Program	2014	**Corps EPA**	Unknown	See Figure 4-1. Location is Coachella Valley Multiple Species HCP/NCCP boundaries.	CWA. Function and services of WOTUS. The RWQCB, FWS, and CDFW are on the Interagency Review Team for this ILF Program but have not approved pre-project credits. State Agencies such as CDFW may direct state-level permitees to this ILF program to satisfy state-level mitigation requirements.
Fenner Valley Desert Tortoise Conservation Bank	2014	**CDFW**	7,500	Service area data not publicly available in electronic format.[d]	At this time (July 2020), Fenner Valley Desert Tortoise Conservation Bank has not met the criteria to be fully established and does not have credits for sale.
Lytle Creek Conservation Bank	In progress	**FWS**	199	See Figure 4-3.	San Bernardino kangaroo rat and Santa Ana woollystar
Mojave Desert Tortoise Umbrella Conservation Bank	2020	**FWS CDFW**	4,700	See Figure 4-4	Desert tortoise (Western Mojave and Colorado River Recovery Units), Mohave ground squirrel, burrowing owl (*Athene cunicularia*), and streams (Mojave River Watershed and Colorado River Basin only)

Name	Year Approved	Signatories[b]	Area (acres)	Location	Credit types
Mojave River Watershed Mitigation Bank	In progress	**Corps Lahontan RWQCB CDFW**	436	Service area data not publicly available in electronic format.	Riverine (streambed), palustrine (scrub-shrub wetland and emergent wetland), and lacustrine (unconsolidated bottom)
Petersen Ranch Mitigation Bank	2016[e]	**Corps RWQCB CDFW**	4,000	See Figure 4-5.	Wetlands – alluvial fan, stream, open water, and riparian Species and habitats – willows (*Salix* sp.), cottonwoods (*Populus* sp.), Swainson's hawk (*Buteo swainsoni*), mulefat (*Baccharis salicifolia*), chaparral, cismontane woodland, Great Basin Scrub, riparian, seeps, meadows, marshes, and grassland
West Mojave Conservation Bank	2017	**Corps CDFW**	914	See Figure 4-5.	Desert tortoise, Mohave ground squirrel, intermittent stream/riparian

[a] Up-to-date information on approved conservation and mitigation banks, including available credits, can be found at the following CDFW, Corps, and FWS websites:
https://www.wildlife.ca.gov/Conservation/Planning/Banking/Approved-Banks
https://ribits.usace.army.mil/
https://www.fws.gov/ventura/endangered/habitatconservation/conservationbanks.html
[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). The EPA, who is also a signatory to some banks and ILF programs was not included in this table because they do not approve credits separate from the Corps.
[c] https://www.marketwatch.com/press-release/wildlands-gains-approval-for-black-mountain-conservation-bank-begins-accepting-mitigation-reservations-2018-11-20
[d] https://mccollum.com/mitigation/FennerServiceArea.pdf
[e] https://landveritasmitigationbanks.com/assets/pdf/petersen_grand_opening_newsletter.pdf

Figure 4-2. Black Mountain Conservation Bank Service Areas

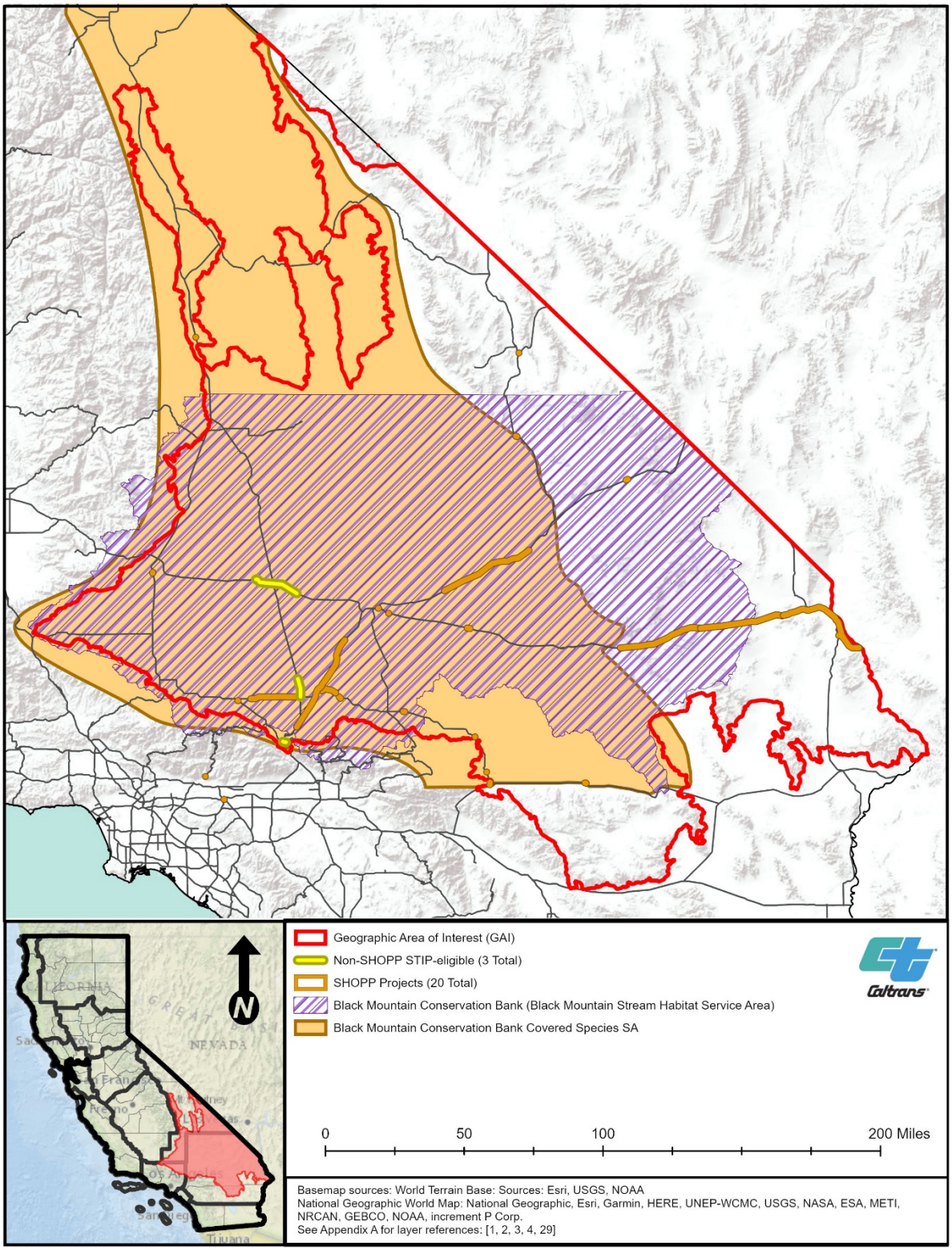


Figure 4-3. Lytle Creek Conservation Bank Service Area

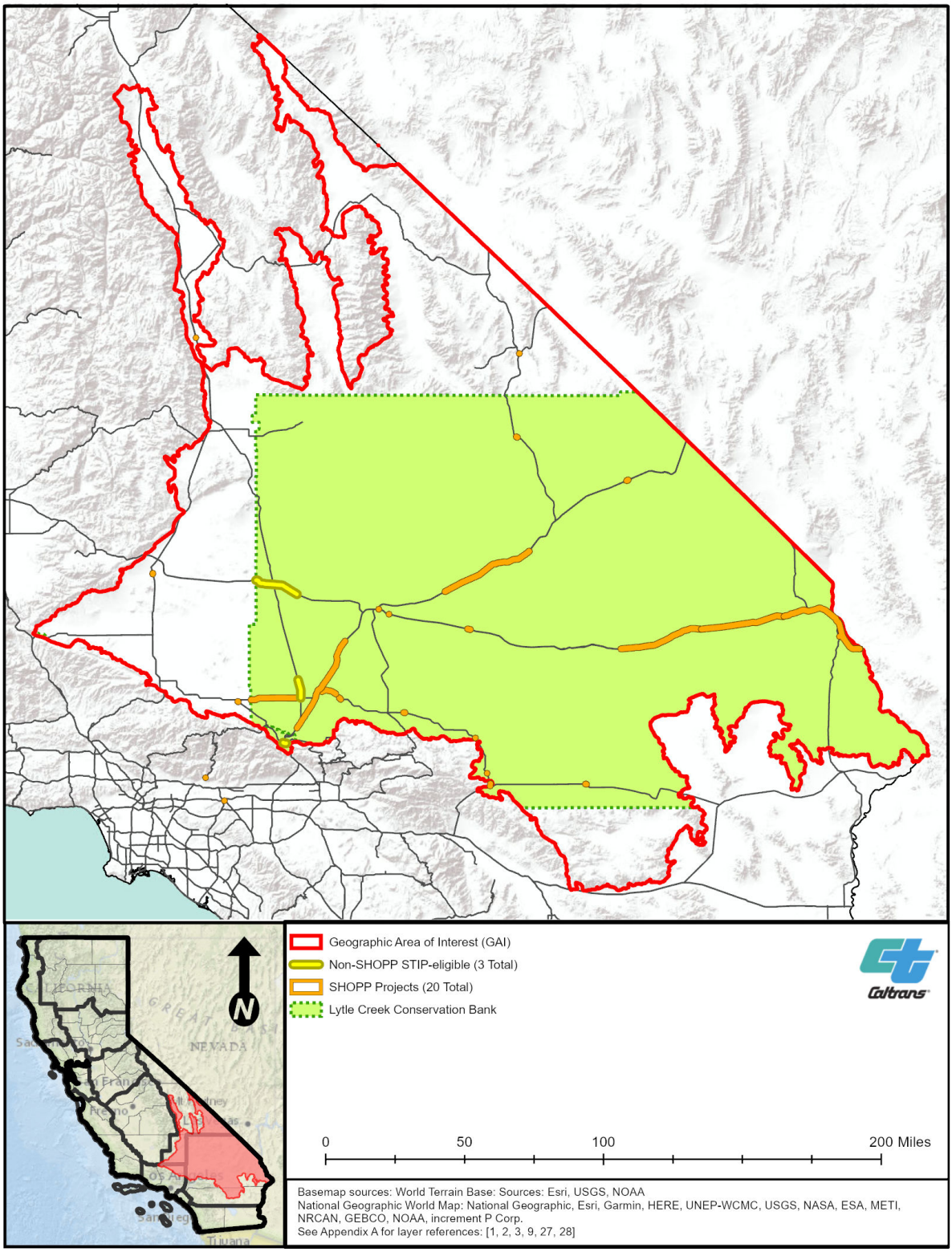


Figure 4-4. Desert Tortoise Umbrella Bank Service Areas

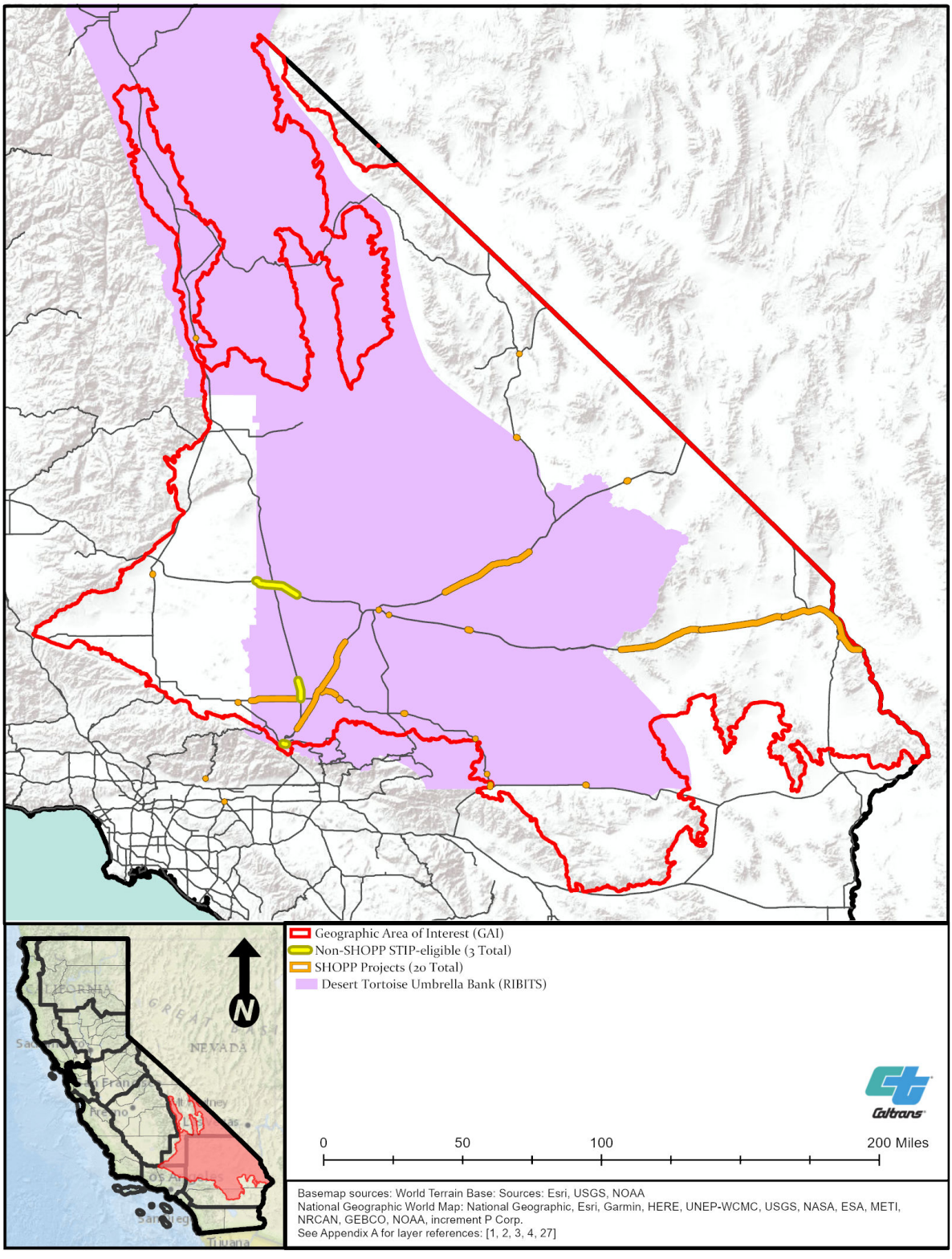
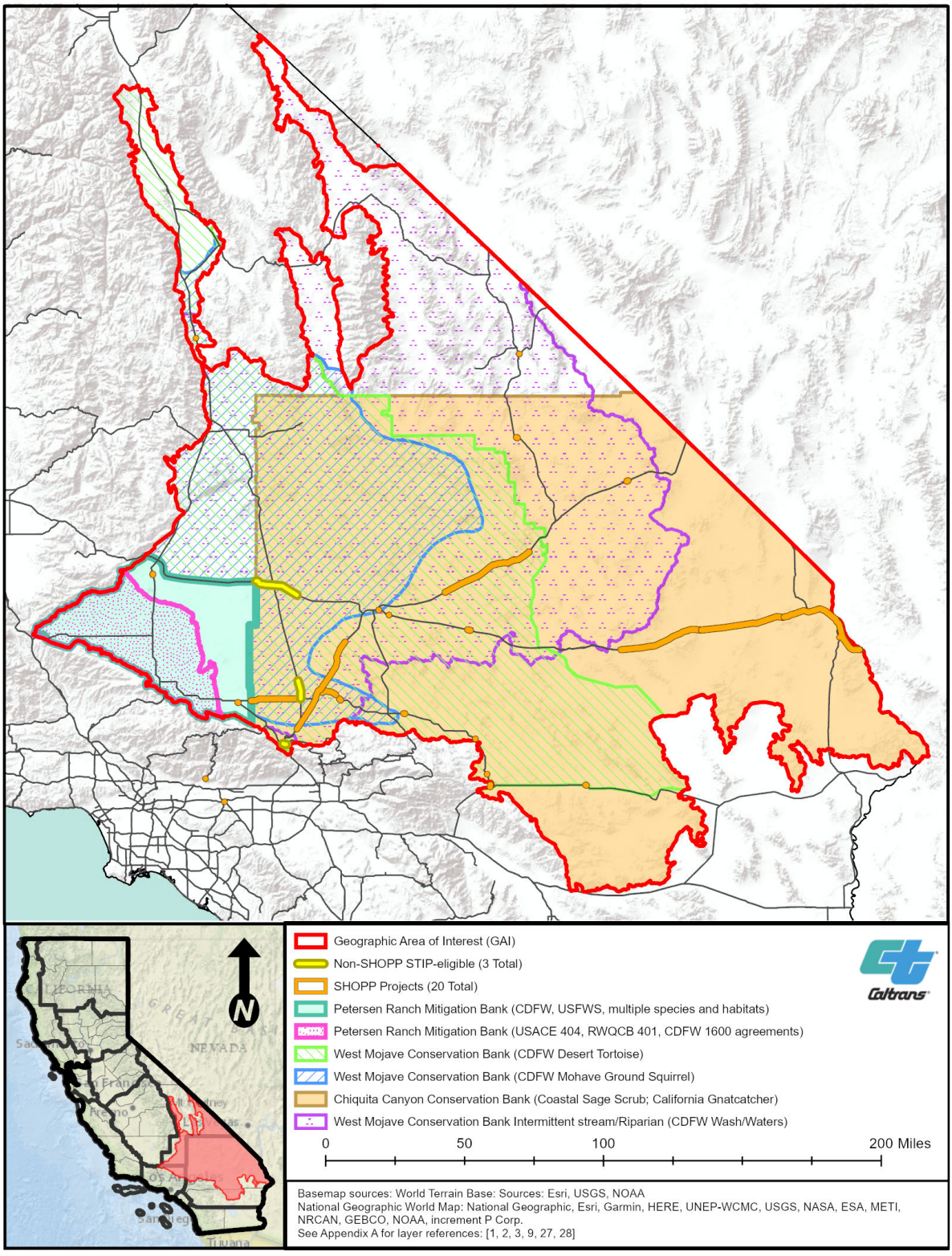


Figure 4-5. Other Bank Service Areas



4.4 In-lieu Fee Programs

Compensatory mitigation can also be accomplished using “in-lieu fee” payments. In-lieu fee mitigation occurs when a permittee provides funds to an in-lieu fee sponsor instead of either completing project-specific permittee responsible mitigation or purchasing credits from a 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 bank credits, in that the mitigation is usually conducted “off-site.” However, it differs in that the mitigation typically occurs after the permitted impacts. Caltrans is aware of one in-lieu fee program that overlaps a small portion of the GAI (Table 4-2). The Coachella Valley Clean Water Act In-Lieu Fee Program service area is aligned with the boundaries of the Coachella Valley Multiple Species HCP/NCCP (Figure 4-1) (Coachella Valley Association of Governments 2007; Corps 2020).

4.5 RCISs and MCAs

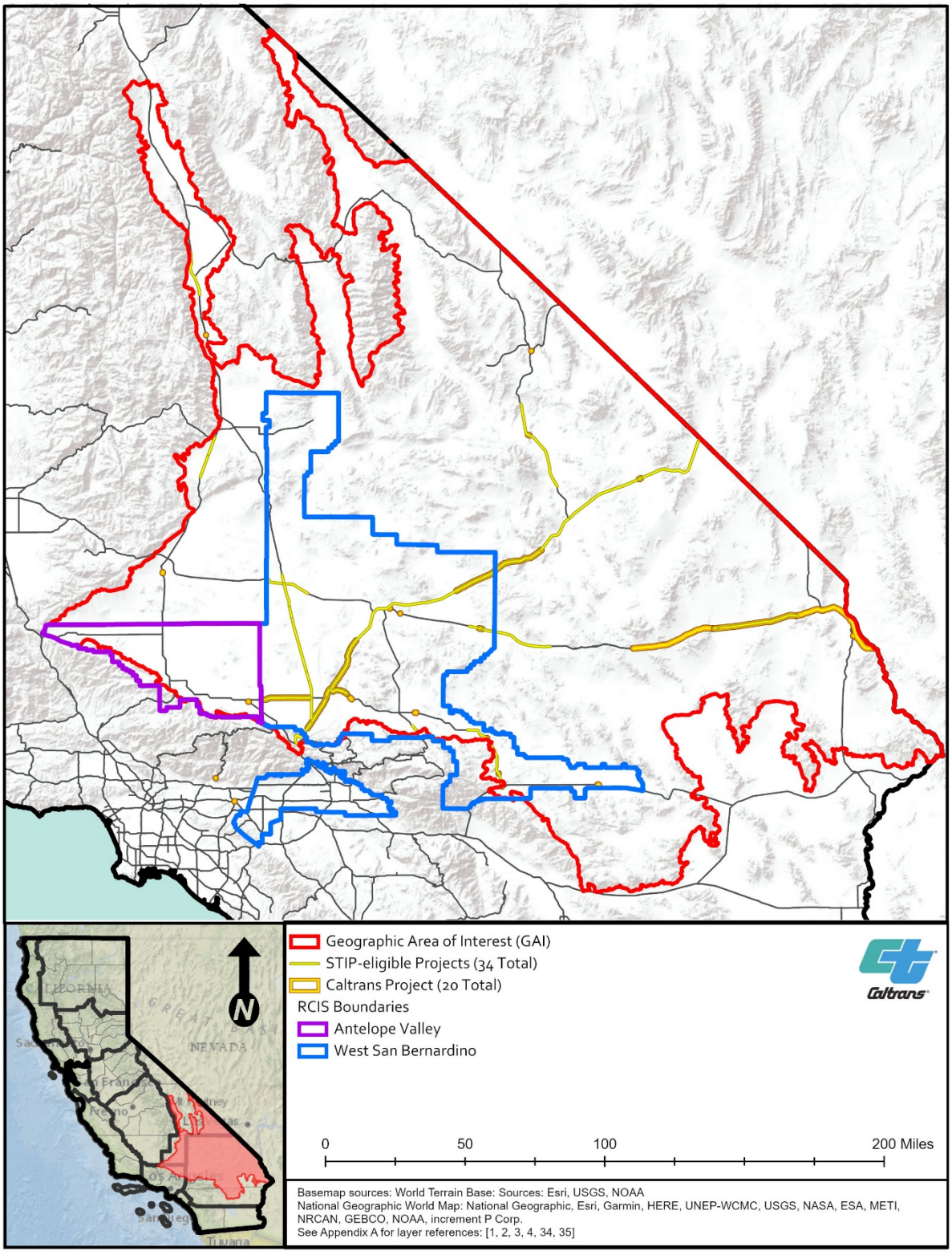
Assembly Bill 2087 established CDFW’s RCIS Program in 2016 (FGC Chapter 9, § 1850, et seq.) This statute set up a voluntary framework for governments and other entities to strategically plan for conservation investments in their areas, including investments performed for compensatory mitigation. To promote the conservation quality of compensatory mitigation investments, the RCIS Program provides an advance mitigation tool that can be applied to resources regulated by CDFW. MCAs are developed when and where an RCIS is approved by CDFW, and create credits that may be used as compensatory mitigation for impacts CESA and the Lake and Streambed Alteration Program. It is important to note that MCAs are not permits like HCPs and NCCPs (Section 4.2). MCA advance mitigation credits are analogous to conservation and mitigation bank credits (Section 4.3). In other words, unlike an HCP and NCCP, RCISs and MCAs are not 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 2019c). Caltrans identified two pending RCISs with service areas that overlap all or part of the GAI (Figure 4-6):

- Antelope Valley RCIS (in progress; ICF 2019)
- San Bernardino County RCIS (in progress)

In addition, the Strategic Growth Councils’ Mojave Regional Conservation Assessment is currently under preparation. This document will be designed to provide a standardized and current assessment of the biological values and ecological conditions in the GAI, and may act as a framework for the development of the RCIS. Because these documents have yet to be approved, no MCAs have been established.

Figure 4-6. RCISs in the GAI



4.5.1. Antelope Valley RCIS

A draft of the Antelope Valley RCIS has been released to the public (ICF 2019). The RCIS area includes lands in Los Angeles County that are part of the Mojave, Sonoran, and Colorado sub-ecoregions of the USDA Ecoregions in California (Bailey 1995), as well as the Petersen Ranch area (Figure 4-6; ICF 2019). The Antelope Valley RCIS identifies 27 focal species, including the desert tortoise, which could require mitigation or are considered as species of conservation importance (ICF 2019). Other important resource conservation elements include natural communities, habitat connectivity, sensitive species occurrences, water features, and agricultural land.

As pointed out above, the DRECP was originally developed by multiple agencies as an HCP, NCCP, and BLM land use plan; however, the HCP and NCCP components were not pursued. Nevertheless, information and data collected for the DRECP were used to inform the foundational biological components of the Antelope Valley RCIS (Desert and Mountain Conservation Authority 2017). Also, Caltrans notes that the Mojave sub-ecoregion boundary dataset used for the Antelope Valley RCIS may not coincide with the Mojave Desert Ecoregion Section boundary used to define the GAI in this RAMNA because of different data sources.

4.5.2. San Bernardino County RCIS

The San Bernardino County RCIS is in progress and includes the valley and west desert subareas (Figure 4-6; Dudek 2018). Conservation elements in the valley subarea include 13 general vegetation communities and 25 focal species, and the landscape processes and features that support them (Rollings-MacDonald and Martinez 2018). Conservation elements in the west desert subarea include 17 general vegetation communities and 30 focal species and the landscape processes and features that support them.

5. MODELED ESTIMATED IMPACTS

In this chapter, Caltrans documents its potential compensatory mitigation need in the GAI for the planning period. Needs were based on Caltrans' anticipated SHOPP projects, regional and local STIP-eligible projects, and their estimated potential compensatory mitigation. Because the assessment is intended to inform advance mitigation project scoping, the impact estimates do not distinguish between permanent or temporary impacts. Actual transportation project impacts will be determined in the future through each transportation project's environmental studies as well as resource and regulatory agency permits.

In the sections below, Caltrans:

- Describes its approach to, and major assumptions when, estimating transportation-related compensatory mitigation needs in the GAI;
- Provides its estimate of potential impacts on wildlife resources for the next 10 years coincident with desert tortoise habitat; and
- Provides its estimate of potential aquatic resource impacts for the next 10 years that are anticipated to affect both desert tortoise and aquatic habitat.

As described in Section 1.4, to focus the assessment, Caltrans District 8 identified the desert tortoise as species of mitigation need, for which results are provided below. Species of mitigation need are species for which a high probability of mitigation need is anticipated. Discussed further in Chapter 9, during advance mitigation scoping, consideration will also be given to additional special-status species that the SAMNA identified as co-occurring with desert tortoise, because they could potentially be affected by the same habitat impacts that affect the desert tortoise. For the aquatic resources, consideration was given to wetlands and waters in the Mojave and Southern Mojave sub-basins for the same suite of transportation projects as considered for desert tortoise impacts.

5.1 Approach

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

Caltrans SHOPP transportation project compensatory mitigation needs were forecast quantitatively using a GIS overlay model developed for the SAMNA (Caltrans 2019b). The SAMNA forecasts potential habitat, species, and/or resource-level impacts from multiple future, planned transportation projects. Results are spatially organized by Caltrans District and by ecological unit for wildlife resources and by sub-basin for aquatic resources over a 10-year period. Transportation projects envisioned in long-term planning documents are conceptual and have not gone through the environmental and permitting processes.

To identify the list of SHOPP projects, Caltrans consulted the SHOPP Ten-Year Book (Caltrans 2018a). The Ten-Year Book includes 20 SHOPP transportation projects in the GAI that are in their planning phases. Of these 20 transportation projects, 17 are forecast to potentially impact desert tortoise habitat (Table 5-1). Three other SHOPP transportation projects were identified as having potential impacts in the GAI, although not on desert tortoise habitat (Table 5-2). The general locations of the 20 projects are shown on most of the maps in this document.

Table 5-1. SHOPP Transportation Projects Potentially Impacting Desert Tortoise

Advertised Year	SHOPP Project ID	EA[a] Number	Caltrans District	County	Route	Begin Mile	End Mile	Activity
2017/18	11132[b]	0P390	8	San Bernardino	18	101.50	115.90	Widen shoulders
2017/18	13950[c]	1E560	8	San Bernardino	247	39.50	40.00	Widen shoulders
2017/18	13957[c]	1E610	8	San Bernardino	62	41.00	41.50	Widen shoulders
2017/18	15637	1E550	8	San Bernardino	127	28.00	R28.5[d]	Widen shoulders
2018/19	13538[c]	0R150	8	San Bernardino	40	R75.0	R100.0	Widen shoulders/regrade median
2019/20	13580	36340	9	Inyo	178	43.40	44.20	Replace/install culverts
2019/20	13795[b]	1C720	8	San Bernardino	15	R96.1	R124.3	Regrade median (put on hold)
2019/20	17037[c]	0R142	8	San Bernardino	40	R125.0	R154.6	Widen shoulders/ regrade median
2020/21	16942[c]	0R141	8	San Bernardino	40	R100.0	R125.0	Standard slopes/ regrade median
2021/22	15854	32620	7	Los Angeles	138	70.3	NA	Bridge rail
2022/23	19062[c]	1J270	8	San Bernardino	247	0.0	23.0	Slip line culvert
2022/23	19081[b]	1J300	8	San Bernardino	18	90.9	96.7	Slip line culvert
2023/24	11280	0R380	8	San Bernardino	40	153.90	154.70	Bridge replacement/new construction; widen shoulders
2023/24	19004	37520	9	Kern	14	12.5	17.6	Bridge rail
2023/24	19175	1J330	8	San Bernardino	15	160.9	161.5	Safety roadside rest area utilities
2024/25	20081[b]	NA	8	San Bernardino	15	30	60	Replace install/culverts
2025/26	20303	NA	9	Inyo	395	R11.8	R20.5	Replace install/culverts

Note: NA = not applicable
[a] EA = expenditure authorization
[b] located within Mojave sub-basin
[c] located within Southern Mojave sub-basin
[d] R = right

Table 5-2. Transportation Projects Outside Desert Tortoise Habitat

Advertised Year	SHOPP Project ID	Caltrans District	County	Route	Begin Mile	End Mile	Activity
2019/20	13956[a]	8	San Bernardino	018	88.9	89.6	Drainage improvements, lane widening
2023/24	19176[a]	8	San Bernardino	040	27.9	28.8	Safety roadside rest area site improvements
2023/24	19693[a]	8	San Bernardino	040	0	15.0	Rock slope protection

[a] located within Southern Mojave sub-basin

Each transportation project's potential impact was defined using a buffer from the edge of pavement (Caltrans 2019b). Different buffer widths were used depending on the activity identified for the transportation project. Relevant buffers to transportation projects proposed in this GAI are provided in Table 5-3.

Table 5-3. SHOPP Transportation Project Activity and Buffer Widths

Activity	Buffer Distance (feet)
Bridge rail	20
Bridge replacement/new construction	40
Replace/install culverts	20
Safety roadside rest area site improvements[a]	10
Safety roadside rest area utilities	10
Slip line culvert	20
Standard slopes	30
Widen shoulders	15

Source: Caltrans 2019b, Table 1
[a] Building, utilities, and/or parking

SAMNA Model Results. The AMP developed the SAMNA strictly and specifically for Caltrans use in advance mitigation planning, i.e. when Caltrans is justifying, proposing, and scoping advance mitigation projects (Caltrans 2019a, Caltrans 2019b). The SAMNA model, its foundation and assumptions, are described in the *Statewide Advance Mitigation Needs Assessment Report* (Caltrans 2019b).

The SAMNA's impact estimates from District 8's planned transportation projects anticipated between fiscal years 2017/2018 through 2026/2027 are provided in the *Statewide Advance Mitigation Needs Assessment Report* (Caltrans 2019b). All results are provided in acres. The SAMNA results estimating impacts on special-status wildlife species are also summarized below in Section 5.2 and provided for all habitats and species in Appendix D. SAMNA results estimating impacts on aquatic resources can be found in Section 5.3.

5.1.2. Non-SHOPP STIP-eligible Needs Assessment

Non-SHOPP STIP-eligible needs were assessed qualitatively, through coordination between the District, MPOs, RTPAs, and other public agencies that implement transportation improvements. Obtaining a reliable list of STIP transportation projects within the 10-year planning horizon is problematic because it is never known which transportation projects will be funded through the STIP until the funds are voted on by the California Transportation Commission ("CTC"), 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 compensatory 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 needs these funds.

To address the dynamic nature of the non-SHOPP STIP-eligible list, it was necessary to identify transportation projects that will be reasonably certain to occur in the same 10-year time frame as the SHOPP projects used in the SAMNA, and that will be 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 on a fiscally constrained[1] Regional Transportation Plan with a Ready to List[2] year identified as occurring in the 10-year planning horizon. The list would be further refined through consultation with the Districts and their regional and local transportation partners (see Table 1-2 of this document for the consultation summary). Of the non-SHOPP STIP-eligible transportation projects that were identified, only three are located within the range of desert tortoise and, of those, only one had a Ready to List date that had not already passed, 2022 (see first row of Table 5-4).

The one-SHOPP STIP-eligible transportation project that is expected to occur is located in the GAI, but not within the Mojave or Southern Mojave sub-basins. This transportation project may, therefore, be able to use any excess desert tortoise mitigation created for, but not subsequently used by, the SHOPP transportation projects listed in Table 5-1, provided that the environmental and permitting process for this transportation project identifies that compensatory mitigation for desert tortoise is needed. Since this transportation project occurs outside the Mojave and Southern Mojave sub-basins, it is not likely that it would be eligible to use any excess aquatic resource mitigation created for, but not used by, the transportation projects identified in Table 5-1. The potential need for additional compensatory mitigation for resources identified in the GAI is documented in Sections 5.2 and 5.3.

[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.

Table 5-4. Non-SHOPP STIP-eligible Projects in Desert Tortoise Habitat

Advertised Year	Project ID	EA Number	District/Lead Agency	County	Route	Begin Mile	End Mile	Activity
2022	0814000140	34013	8/Caltrans	San Bernardino	138	14.2	15.2	Widen two BNSF Railway bridge structures to four lanes and construct retaining walls
2017	0800000616	34770	8/Caltrans	San Bernardino, Kern	058	0	12.9	Construct four-lane divided expressway
2018	0813000220	0F631	8/San Bernardino County Transportation Authority	San Bernardino	395	11.2	16.6	Widen highway to four lanes and add left turn

5.2 Estimated Wildlife Impacts

The results of the habitat and special-status wildlife SAMNA analyses were described in Chapter 2 and in the SAMNA (Caltrans 2019b). The SAMNA special-status species results, provided in Appendix D, include the 20 transportation projects identified in Tables 5-1 and 5-2. The SAMNA analyses in Appendix D determined that the 20 SHOPP transportation projects could potentially impact 16 habitat types, which could support up to 106 special-status species, including the desert tortoise.

The estimated special-status wildlife impacts provided are focused on the mitigation needs identified by the District. Wildlife impacts focus on desert tortoise, which the District identified as the species of mitigation need, and the estimates of impacts on its potential habitat. Consideration is also given to the other species that the SAMNA model indicates may also use the same habitat as the desert tortoise.

5.2.1. Desert Tortoise

Applying the methods described in Section 5.1.1 above, impacts on the desert tortoise and its habitat were estimated for the transportation projects listed in Table 5-1. The SAMNA estimated that 534.71 acres of desert tortoise habitat may be impacted by the 17 Caltrans SHOPP projects listed in Table 5-1 (Caltrans 2019b). Results are summarized below, in Tables 5-5 and 5-6.

5.2.2. Other Special-status Species

The desert tortoise co-occurs with other protected plant, fish, amphibian, reptile, bird, and mammal species. Applying the methods described in Section 5.1.1, the SAMNA forecast impacts on an additional 64 special-status terrestrial species that potentially use the same habitats as the desert tortoise (Table 5-6). The special-status terrestrial species evaluated through the SAMNA consist of federal and state threatened, endangered, or sensitive species, state fully protected or rare species, or state species of special concern (Caltrans 2019b). Though recently petitioned, impacts to Joshua tree were not calculated; however, there may be an opportunity to incorporate Joshua tree into a specific advance mitigation project, should Joshua tree become a candidate before an advance mitigation project is proposed.

Table 5-5. Estimated SHOPP Impacts on Desert Tortoise

Subsection Name	Number of Caltrans SHOPP Projects	Number of Habitats	Estimated Acres
Amargosa Desert-Pahrump Valley	1	2	1.87
Bullion Mountains-Bristol Lake	1	1	55.68
High Desert Plains and Hills	5	7	50.17
Kingston Range-Valley Wells	1	1	0.50
Lucerne-Johnson Valleys and Hills	5	4	4.23
Mojave Valley-Granite Mountains	1	1	0.08
Piute Valley-Sacramento Mountains	3	2	135.88
Providence Mountains-Lanfair Valley	2	3	285.64
Silurian Valley-Devil's Playground	1	3	0.42
Funeral Mountains-Greenwater Valley	1	1	0.08
Owens Valley	1	1	0.15
Total	**17[a]**	**9[a]**	**534.7**

[a] Totals may not reflect numbers presented in rows above. Some SHOPP transportation projects and some habitats cross more than one subsection. The 17 transportation projects are listed in Table 5-1.

This page is intentionally left blank.

Table 5-6. Estimated SHOPP Impacts on Special-status Species in Desert Tortoise Habitat[a,b]

Common Name	Species Name	Status	Alkali Desert Scrub	Annual Grassland	Barren	Desert Riparian	Desert Scrub	Desert Succulent Shrub	Desert Wash	Joshua Tree	Sagebrush
Amphibians	See below	See below	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	0.07	38.71	0	0	0	0
California red-legged frog	*Rana draytonii*	FT/SSC	0	0.43	0	0	0	0	0	0	0
Couch's spadefoot	*Scaphiopus couchii*	FS/SSC	0	0	0	0	432.19	0	0	0	0
Birds	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
tricolored blackbird	*Agelaius tricolor*	FS/SCE	0	0.14	0	0	0	0	0	0	0
golden eagle	*Aquila chrysaetos*	FS/SFP	0.6	0.57	0.28	3.21	517.28	4.19	5.52	2.71	0.36
great egret	*Ardea alba*	FS	0.43	0.14	0	3.21	0	0	0	0	0
great blue heron	*Ardea herodias*	FS	0	0.57	0	3.21	0	0	0	0	0
long-eared owl	*Asio otus*	SSC	0	0.57	0	3.21	517.28	0	0	0	0.36
burrowing owl	*Athene cunicularia*	FS/SSC	0.6	0.57	0.28	3.21	517.28	4.19	5.52	2.71	0.36
Swainson's hawk	*Buteo swainsoni*	FS/ST	0	0.14	0	0	1.45	0	0	0	0
mountain plover	*Charadrius montanus*	FS/SSC	0	0	0.09	0	0	0	0	0	0.11
gilded flicker	*Colaptes chrysoides*	FS/SE	0	0	0	3.14	435.09	0	0	0.5	0
white-tailed kite	*Elanus leucurus*	FS/SFP	0.26	0.57	0.12	0	483.7	0	0	0	0
bald eagle	*Haliaeetus leucocephalus*	FS/SE	0	0	0	3.14	0	0	0	0	0
yellow-breasted chat	*Icteria virens*	SSC	0	0	0	3.21	0	0	0	0	0
least bittern	*Ixobrychus exilis*	SSC	0	0	0	3.14	0	0	0	0	0
loggerhead shrike	*Lanius ludovicianus*	SSC	0.6	0.57	0.28	3.21	517.28	4.19	5.52	2.71	0.36
gila woodpecker	*Melanerpes uropygialis*	FS/SE	0	0	0	3.14	0	0	0	0	0
Lucy's warbler	*Oreothlypis luciae*	FS/SSC	0	0	0	3.21	434.43	0	0.08	0	0
osprey	*Pandion haliaetus*	FS	0.15	0	0	3.14	437.97	0	0	0	0
American white pelican	*Pelecanus erythrorhynchos*	SSC	0	0	0.12	0	0	0	0	0	0
summer tanager	*Piranga rubra*	SSC	0	0	0	3.21	0	0	0	0	0
vermilion flycatcher	*Pyrocephalus rubinus*	SSC	0	0	0	3.21	0	0	0	0	0
yellow warbler	*Setophaga petechia*	SSC	0	0	0	3.21	0	0	0	0	0
Bendire's thrasher	*Toxostoma bendirei*	FS/SSC	0	0	0	0	0	4.19	0	0.53	0
Crissalthrasher	*Toxostoma crissale*	SSC	0	0	0	3.14	0		1.22	0	0
Le Conte's thrasher	*Toxostoma lecontei*	SSC	0.6	0	0	0	517.28	4.19	5.52	2.71	0
Arizona Bell's vireo	*Vireo bellii arizonae*	FS/SE	0	0	0	3.14	0	0	0	0	0

Common Name	Species Name	Status	Alkali Desert Scrub	Annual Grassland	Barren	Desert Riparian	Desert Scrub	Desert Succulent Shrub	Desert Wash	Joshua Tree	Sagebrush
yellow-headed blackbird	*Xanthocephalus xanthocephalus*	SSC	0	0.14	0	0	0	0	0	0	0
Mammals	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
pallid bat	*Antrozous pallidus*	FS/SSC	0.6	0.57	0.28	3.21	517.28	4.19	5.52	2.71	0.36
Townsend's big-eared bat	*Corynorhinus townsendii*	FS/SSC	0.22	0.14	0	0	0	0	0.08	0.63	0.2
spotted bat	*Euderma maculatum*	FS/SSC	0.6	0.57	0	3.21	517.28	4.19	5.52	2.71	0.36
western mastiff bat	*Eumops perotis*	FS/SSC	0.6	0.57	0.28	3.21	517.28	4.19	5.52	2.71	0
California leaf-nosed bat	*Macrotus californicus*	FS/SSC	0	0	0.08	3.14	466.29	4.19	5.03	0	0
California vole	*Microtus californicus*	FE/SE	0.18	0.43	0	0	0	0	0	0	0.36
Arizona myotis	*Myotis occultus*	SSC	0	0	0	3.14	435.09	0	0	0	0
fringed myotis	*Myotis thysanodes*	SSC	0.22	0.14	0	0	00	0	0.59	0.5	0
cave myotis	*Myotis velifer*	FS/SSC	0	0	0	3.14	435.09	0	0	0	0
Yuma myotis	*Myotis yumanensis*	FS	0.15	0	0	3.14	436.54	0	0	0	0
pocketed free-tailed bat	*Nyctinomops femorosaccus*	SSC	0	0	0	0	432.19	0	0	0	0
southern grasshopper mouse	*Onychomys torridus*	SSC	0.6	0.57	0	3.21	517.28	4.19	5.52	0	0.36
bighorn sheep[c]	*Ovis canadensis*	FS/CFP	0.24	0	0	3.18	491.13	4.19	5.52	0	0
American badger	*Taxidea taxus*	SSC	0.6	0.57	0.28	3.21	517.28	4.19	5.52	2.71	0.36
Mojave ground squirrel	*Xerospermophilus mohavensis*	FS/ST	0.4	0.57	0	0	480.8	0	0	2.18	0
Reptiles	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
desert tortoise	*Gopherus agassizii*	FT/ST	0.6	0.57	0.28	3.21	517.28	4.19	5.52	2.71	0.36
Panamint alligator lizard	*Elgaria panamintina*	FS/SSC	0	0	0	0	1.45	0	0	0	0
gila monster	*Heloderma suspectum*	FS/SSC	0	0	0	0	432.19	0	0	0.5	0
Blainville's horned lizard	*Phrynosoma blainvillii*	FS/SSC	0.18	0.43	0	0	0	0	0		0
Coachella fringe-toed lizard	*Uma inornata*	SE	0	0	0	0	432.19	0	0	0	0
Mojave fringe-toed lizard	*Uma scoparia*	FS/SSC	0.38	0	0.28	0.07	482.88	0	2.34	0	0
Plants	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below	See below
Lane Mountain milk-vetch	*Astragalus jaegerianus*	FE	0	0	0	0	517.28	0	0	2.71	0
Long Valley milk-vetch	*Astragalus johannis-howellii*	FS/SR	0	0	0	0	1.45	0	0	0	0

Common Name	Species Name	Status	Alkali Desert Scrub	Annual Grassland	Barren	Desert Riparian	Desert Scrub	Desert Succulent Shrub	Desert Wash	Joshua Tree	Sagebrush
Coachella Valley milk-vetch	*Astragalus lentiginosus* var. *coachellae*	FE	0	0	0	0	432.19	0	0	0	0
Peirson's milk-vetch	*Astragalus magdalenae* var. *peirsonii*	FT/SE	0	0	0	0	432.19	0	0	0	0
Mono milk-vetch	*Astragalus monoensis*	FS/SR	1.45	0	0	0	0	0	0	0	0
Wiggins' croton	*Croton wigginsii*	FS/SR	0	0	0	0	432.19	0	0	0	0
July gold	*Dedeckera eurekensis*	FS/SR	0	0	0	0	433.64	0	0	0	0
Red Rock tarplant	*Deinandra arida*	FS/SR	0	0	0	0	517.28	0	0	0	0
Borrego bedstraw	*Galium angustifolium* ssp. *borregoense*	SR	0	0	0	0	432.19	0	0	0	0
Algodones Dunes sunflower	*Helianthus niveus* ssp. *tephrodes*	FS/SE	0	0	0	0	432.19	0	0	0	0
rock lady	*Holmgrenanthe petrophila*	SR	0	0	0	0	517.28	0	0	0	0
spreading navarretia	*Navarretia fossalis*	FE	0	0.14	0	0	0	0	0	0	0
Amargosa nitrophila	*Nitrophila mohavensis*	FE/SE	0	0.14	0	0	0	0	0	0	0
Eureka Dunes evening-primrose	*Oenothera californica* ssp. *eurekensis*	SR	0	0	0	0	517.28	0	0	0	0
Eureka Valley dune grass	*Swallenia alexandrae*	FT/SR	0	0	0	0	517.28	0	0	0	0

Notes: SAMNA forecasts are discrete for each species/habitat pair and are not additive.
FE = federally endangered, FS = federal sensitive, FT = federally threatened, SCE = state candidate endangered, SCT = state candidate threatened, SE = state endangered, SFP = state fully protected, SR = state rare, SSC = species of special concern (CDFW), ST = state threatened
[a] Acres of desert tortoise habitat forecast to be impacted. [b] Desert tortoise is both a federal and state listed species. [c] Includes both Sierra Nevada bighorn and desert bighorn.

This page is intentionally left blank.

5.3 Estimated Aquatic Resources Impacts

Aquatic resources impacts are categorized as potential impacts on special-status fishes, wetlands, and waters. In the following sections, estimated aquatic resource impacts are presented for the needs identified by the District. The District focused on potential impacts on aquatic resources in the Mojave and Southern Mojave sub-basins, which are located entirely within the GAI's boundaries. Of the 17 SHOPP transportation projects that may potentially affect desert tortoise habitat listed in Table 5-1, 10 occur in these sub-basins. In addition, the three SHOPP transportation projects that are not located within desert tortoise habitat are located in Southern Mojave sub-basin (Table 5-2).

5.3.1. Estimated Impacts on Special-status Fish Species

Applying the methods described in Section 5.1.1, of the 10 SHOPP transportation projects that could occur in desert tortoise habitat within the Mojave and Southern Mojave sub-basins (Table 5-1), none would result in impacts on special-status fish habitat. Impacts on suitable habitat for the Mohave tui chub (*Siphateles bicolor mohavensis*) could occur as a result of the three transportation projects outside desert tortoise habitat (Appendix D); however, these impacts are not analyzed further as they are not derived from transportation projects that were forecast to potentially impact desert tortoise habitat in the GAI, and Mohave tui chub was not determined to be a species of mitigation need for this GAI.

5.3.2. Estimated Impacts on Wetlands

Wetland resources are mapped in Appendix F. Applying the methods described in Section 5.1.1, of the 10 transportation projects that could occur in desert tortoise habitat located in the Mojave and Southern Mojave sub-basins, one transportation project has the potential to permanently impact 0.07 acre of fresh emergent wetland habitat in the HUC-8 Mojave River sub-basin (Table 5-7).

Note the SAMNA's wetland layers provide output that appears similar to its terrestrial output, in that the results are provided in in terms of wetland habitat. Wetland forecasts based on the SAMNA's wetland layer, however, are considered more certain than wetland habitat forecasts based on the SAMNA's terrestrial habitat layers; hence, the wetland estimates below are based solely on the SAMNA's wetland data layer (Caltrans 2019b).

Table 5-7. Estimated SHOPP Impacts on Mojave and Southern Mojave Sub-basin Wetlands and Waters

Sub-basin (HUC 8)	Number of Caltrans SHOPP Projects	Freshwater Emergent Wetland (acres)	Number of Caltrans SHOPP Projects	Waters Totals by HUC-10 (acres)
Mojave	1	0.07	8	3.68
Southern Mojave	0	0.00	6	7.91

5.3.1. Estimated Impacts on Waters

Water resources are mapped in Appendix F. Applying the methods described in Section 5.1.1, of the 13 transportation projects that occur in the Mojave and Southern Mojave sub-basins (Table 5-1 and Table 5-2), 8 are estimated to impact 3.68 acres of waters in the Mojave Dessert sub-basin and 6 are estimated to impact 7.91 acres of waters in the Southern Mojave Desert sub-basin (Table 5-7). STIP-eligible projects are planned near planned SHOPP transportation projects and may potentially affect the same water resources; additional mitigation need may be expected from STIP-eligible transportation projects that fall within the Mojave Desert and Southern Mojave Desert HUC-8 sub-basins.

6. BENEFITING TRANSPORTATION PROJECT CONSIDERATIONS

Benefiting transportation projects where delivery schedules could benefit from advance mitigation credits. Potentially benefiting transportation projects were identified in Chapter 5 for advance mitigation planning to guide advance mitigation scoping. Actual benefiting transportation projects will be determined in the future. Caltrans and relevant resource agencies shall 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.

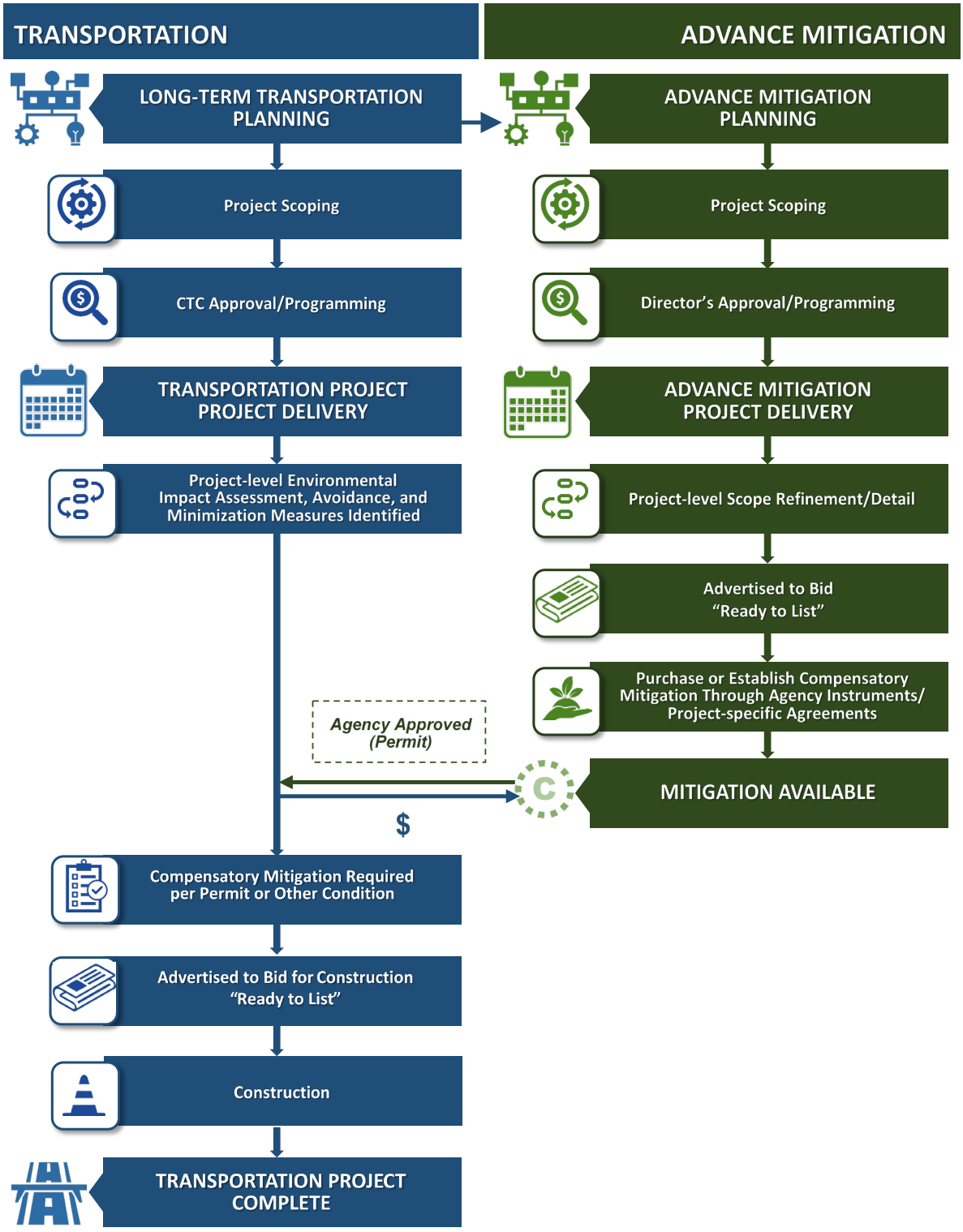
In this chapter, Caltrans summarizes the scheduling considerations and constraints of potential benefiting transportation projects. A time frame for the need for forecast mitigation is provided and analyzed. The potentially benefiting transportation projects' acceleration priorities are documented in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

6.1 Why Timing Is Important

Broadly speaking, an advance mitigation project consists of (1) purchasing compensatory mitigation that has been previously approved by the resource agencies through a conservation/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. The time it takes to perform each authorized activity varies; however, purchasing compensatory mitigation would likely take less time than establishing compensatory mitigation.

Caltrans transportation projects must have permits and compensatory mitigation lined up before advertising and selecting a contractor to bid upon and perform a transportation project (Figure 6-1). Hence, for advance mitigation scoping, the District's selection 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). The date when a Caltrans potential transportation project is expected to be Ready to List (that is, the project has been approved to be advertised to bid for construction) is an appropriate estimate for identifying when a Caltrans advance mitigation project will need to deliver compensatory mitigation to a potential benefiting transportation project.

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



6.2 Patterns of Estimated Potential Impacts

Given that the planning horizon for this assessment covers the 2017/2018 through 2026/2027 fiscal years, and that some of the transportation projects may have already gone to bid, it is necessary to consider which of the transportation projects:

- Would need to acquire compensatory mitigation before the AMP can deliver.
- Would need compensatory mitigation delivered in a nearer time frame, which may favor seeking already existing credits.
- Would need compensatory mitigation further out in time, and whether there is time to establish new compensatory mitigation.

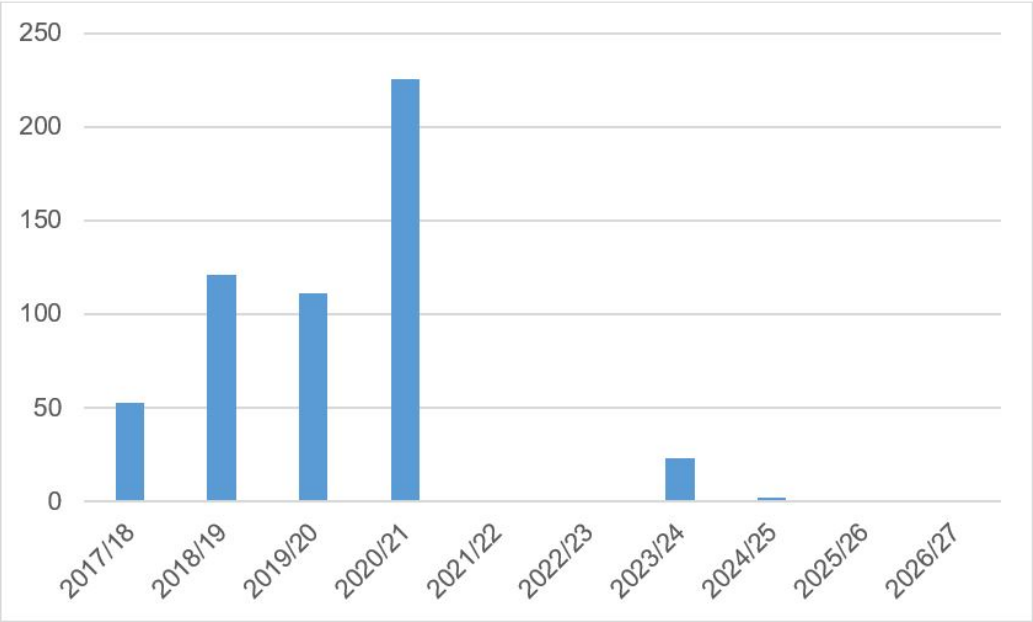
Initial estimated impact patterns are based on the information provided in Table 5-1. As shown in Table 6-1 and Figure 6-2, when the 17 SHOPP transportation projects identified previously have their forecast impacts examined relative to their expected advertising date, we can see that 95 percent of desert tortoise compensatory mitigation needs occur within the first 4 years of the 10-year planning horizon, and a significant portion of those impacts (42 percent) are needed by the 2020/2021 fiscal year. Spatially, these early projects are largely concentrated in the Piute Valley-Sacramento Mountains and Providence Mountains-Lanfair Valley subsections in the southeastern portion of the GAI, with most of the transportation projects in the southern portion of the GAI (Figure 6-3).

Table 6-1. Estimated Impacts on Desert Tortoise Habitat, by Transportation Project Delivery Year[a]

Expected Advertisement Year	Number of Transportation Projects	Estimated Potential Impacts (Acres)	Forecast Percentage	Forecast Cumulative Percentage
2017/18	4	52.33	9.75%	9.75%
2018/19	1	120.96	22.55%	32.30%
2019/20	3	110.95	20.68%	52.98%
2020/21	1	225.61	42.06%	95.04%
2021/22	1	0.65	0.12%	95.16%
2022/23	2	0.90	0.17%	95.33%
2023/24	3	22.72	4.24%	99.56%
2024/25	1	2.19	0.41%	99.97%
2025/26	1	0.15	0.03%	100.00%
2026/27	0	0.00	0.00%	100.00%

[a] Based on 2017/18–2026/27 (Quarter 2) SHOPP Ten-Year Book

Figure 6-2. Estimated Impacts on Desert Tortoise Habitat, by Transportation Project Delivery Year[a]



[a] Based on 2017/18–2026/27 (Quarter 2) SHOPP Ten-Year Book

6.3 Acceleration Priorities

As shown in Table 6-1 and Figure 6-2—which are based on Quarter 2 of the Ten-Year Book—the majority of impacts on desert tortoise habitat were forecast for early in the 10-year period evaluated in the SAMNA, 2017/2018–2016/2027. However, because of the dynamic nature of transportation planning, since the 2017/18–2026/27 (Quarter 2) SHOPP Ten-Year Book was published, plans associated with three transportation projects have changed (Table 6-2). At this time:

- EA 13580 is going to be delayed from 2019/2020 to 2024/2025.
- EA 19004 is going to be delayed from 2023/2024 to 2025/2026.
- EA 20081 has been excluded from the 2017/18–2026/27 (Quarter 4) SHOPP Ten-Year Book.

Caltrans transportation project sequence prioritization reflects the updated information provided in the 2017/18–2026/27 (Quarter 4) SHOPP Ten-Year Book and is based on meeting the District's needs and performance targets while financially balancing the District's accounts. At this time, the Road Repair and Accountability Act of 2017 priorities are the District's priorities, which generally fall in the middle and end of the 10-year assessment period (Table 6-2). Figure 6-3 illustrates the location of the prioritized transportation projects, by year.

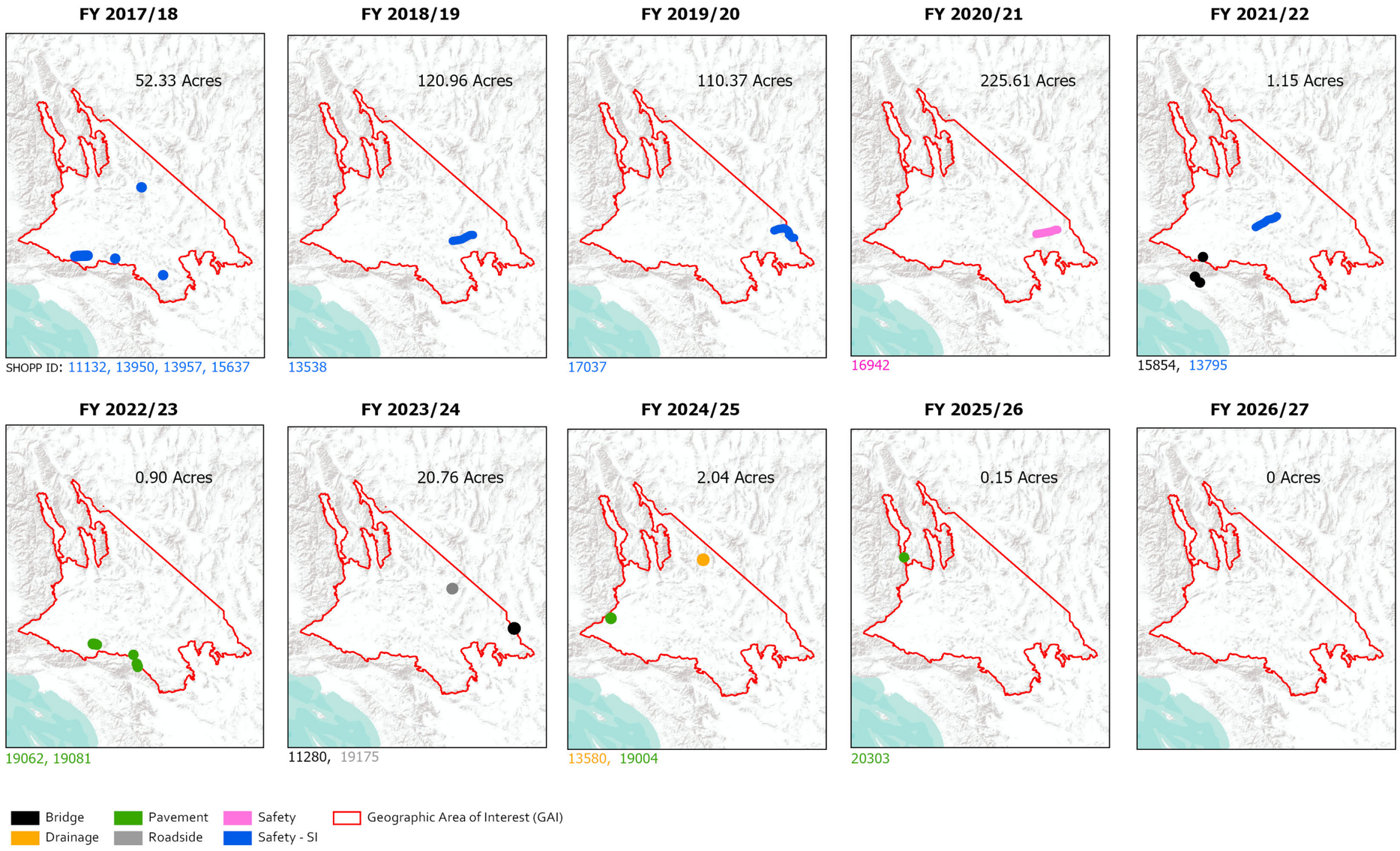
Table 6-2. Transportation Project Acceleration Priorities[a]

Advertised Year	SHOPP Project ID	EA Number	Caltrans District	Activity	Notes
2017/18	11132	0P390	8	Widen shoulders	NA
2017/18	13950	1E560	8	Widen shoulders	NA
2017/18	13957	1E610	8	Widen shoulders	NA
2017/18	15637	1E550	8	Widen shoulders	NA
2018/19	13538	0R150	8	Widen shoulders/regrade median	NA
~~2019/20~~ **2024/25**	13580	36340	9	Replace/install culverts	Priority
2019/20	17037	0R142	8	Widen shoulders/regrade median	NA
2020/21	16942	0R141	8	Standard slopes/regrade median	NA
2021/22	15854	32620	7	Bridge rail	Priority
~~2019/20~~ **2021/22**[b]	13795	1C720	8	Regrade median (put on hold)	NA
2022/23	19062	1J270	8	Slip line culvert	Priority
2022/23	19081	1J300	8	Slip line culvert	Priority
2023/24	11280	0R380	8	Bridge replacement/new construction; widen shoulders	Priority
~~2023/24~~ **2025/26**	19004	37520	9	Bridge rail	Priority
2023/24	19175	1J330	8	Safety roadside rest area utilities	NA
~~2024/25~~	~~20081~~[c]	~~NA~~	~~8~~	~~Replace install/culverts~~	~~NA~~
2025/26	20303	NA	9	Replace install/culverts	Priority

Note: NA = not applicable
[a] Adapted from Table 5-1
[b] Advertised year (delayed to overlapping project 0P400 – XpressWest) – updated per Ten-Year Book, Quarter 4, dated 7/2019
[c] No longer listed in Ten-Year Book, Quarter 4, dated 7/2019

This page is intentionally left blank.

Figure 6-3. Location of Estimated Impacts on Desert Tortoise Habitat, by Transportation Project Delivery Year and Transportation Project[a]



Sources: Esri, USGS, NOAA

[a] Based on 2017/18–2026/27 (Quarter 2) SHOPP Ten-Year Book [b] SHOPP transportation projects are also shown on the resource-related maps provided in this document.

This page is intentionally left blank.

7. WILDLIFE RESOURCES CONSERVATION GOALS AND OBJECTIVES

Caltrans' primary objective for wildlife resources is to avoid and minimize all impacts on special-status wildlife species from Caltrans transportation projects in the GAI. However, sometimes compensatory mitigation is needed. Credits or values established through SHC § 800.6(a)-authorized advance mitigation projects offer the unique opportunity to consolidate needed mitigation to provide strategically placed and environmentally sound replacement habitat and to provide an improved environmental outcome that may not be available through the usual transportation project-by-project approach to mitigation.

Caltrans seeks to align its advance mitigation projects with resource and regulatory agencies' conservation goals and objectives, and thus contribute to an improved environmental outcome within the GAI. With this in mind, in this chapter, Caltrans presents its understanding of resource and regulatory agencies' regional conservation goals and objectives that could apply to wildlife resources forecast to be potentially affected by SHOPP and STIP-eligible transportation projects, as discussed in Chapters 5 and 6.

The goals and objectives assembled for this chapter are intended to guide advance mitigation project scoping decisions toward those choices that provide for 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 useable by future transportation projects as specified in SHC § 800.[1] Compensatory mitigation useable by future transportation projects should be expressed in standard units or terms recognized by the resource and regulatory agencies.

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

7.1 Approach

For the purposes of this RAMNA, conservation goals and objectives are a broad set of regional natural resource sustainability goals and objectives that are consistent with both regulatory requirements and conservation science. To determine the wildlife resource conservation goals and objectives applicable to the GAI, Caltrans:

[1] Pursuant to SHC § 800.9, to the maximum extent practicable, the information required for an RCIS is presented here. During CDFW's review of an RCIS, CDFW determines whether or not the goals and objectives presented in the RCIS are consistent with FGC § 1852, subdivision (c)(8).

- First identified the resource and regulatory agencies with the authority to include wildlife resource-related compensatory mitigation as a transportation project permit condition;
- Next, to improve the probability that advance mitigation projects undertaken by Caltrans will yield credits (or similar) that will be usable during the planning period, identified species of mitigation need from the hundreds of wildlife resources evaluated through the SAMNA (see Section 1.3); and
- Then, for the species of mitigation need, identified:
  - Federal and state binding and non-binding regional conservation and land management plans relevant to the species of mitigation need;
  - Current and projected pressures and stressors on the species of mitigation need;
  - Opportunities to enhance the conservation benefits to the species of mitigation need through advance mitigation; and
  - Opportunities to provide co-benefits, where possible, to other special-status and native wildlife species through advance mitigation.

Last, Caltrans analyzed the aforementioned data 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 permit condition associated with the activities. The results of this analysis are the advance mitigation conservation goals and objectives discussed in this chapter.

7.2 Resource and Regulatory Agencies with Wildlife Resources Oversight

Table 7-1 lists the resource and regulatory agencies with wildlife resources oversight in the GAI, and who have the authority to require wildlife resource-related compensatory mitigation for transportation projects. Wildlife species also use aquatic resources, such as streams, wetlands, and other waters, that are under the jurisdiction of other resource and regulatory agencies; this RAMNA compiles goals and objectives for aquatic resources separately in Chapter 8.

Table 7-1. Resource Agencies with Jurisdiction over Wildlife Resources

Agency	Summary
CDFW – Region 4, Central; Region 5, South Coast; and Region 6, Inland Deserts	CDFW has jurisdiction over the conservation, protection, and management of fish, wildlife, native plants, and the habitats necessary for biologically sustainable populations of those species in California. Additionally, 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 all federally protected wildlife species and critical habitats, and requires consultation and coordination to be in compliance with the ESA. FWS authorities, including its role in mitigation, are codified under multiple statutes that address management and conservation of natural resources from many perspectives, including, but not limited to, the effects of land, water, and energy development on fish, wildlife, plants, and their habitats. FWS approves HCPs to address impacts on federally protected species, for projects lacking a federal nexus, under ESA § 10(a)1(B). For projects with a federal nexus and potential impacts on federally protected species, FWS issues biological opinions under Section 7 of the ESA.

7.3 Species of Mitigation Need

The desert tortoise occurs north and west of the Colorado River in the Mojave Desert of California, Nevada, Arizona, and southwestern Utah, and in the Sonoran (Colorado) Desert in California (FWS 2011). Desert tortoise occupy a variety of desert habitats from flats and slopes dominated by creosote bush scrub at lower elevations to rocky slopes in blackbrush and juniper woodland ecotones at higher elevations, and occur from below sea level to 7,300 feet above sea level (FWS 2011). Typical habitat for desert tortoise in the GAI has been characterized as creosote bush scrub below 5,500 feet, where precipitation ranges from 2 to 8 inches, the diversity of perennial plants is relatively high, and production of ephemeral plants is high (FWS 2011), but also includes creosote bursage, shadscale scrub,[2] Joshua tree woodland, and mixed blackbush scrub (NatureServe 2018). Desert tortoise are well-adapted to living in highly variable and harsh desert environments. They spend much of their lives in burrows, emerging in late winter or early spring and remaining active through fall (FWS 2011). Because of the time spent in burrows, desert tortoise can be difficult to detect where present.

[2] Also referred to as shadscale saltbush scrub

7.4 Regional Conservation Efforts

Caltrans' understanding of resource and 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 desert tortoise, identify key habitats or designate specific lands or areas to protect for desert tortoise conservation in the GAI. Presented in Table 7-2, these 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 resource and regulatory agencies.

7.5 Pressures and Stressors

Pressures and stressors refer to environmental trends or physical, chemical, or biological factors or conditions that affect the desert tortoise 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 *Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*)* (FWS 2011) refers to these analogous pressures and stressors as threats.

The plans included in Table 7-2 identify multiple pressures and stressors critical to the decline of desert tortoise within its range (BLM 2005, 2015; FWS 2011). 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 STIP, and only those pressures and stressors that are likely to be affected by these transportation projects are evaluated in this document and discussed below.

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 desert tortoise habitat, including the spread of invasive plant species. Additionally, roads and urbanization fragment habitat and impede connectivity between existing desert tortoise populations.

Table 7-2. Documents Identifying Areas of Habitat Important for Desert Tortoise in the GAI

Document	Reference	Areas of Important Habitat
Special Status Taxa Documents	**See below**	**See below**
A Petition to the State of California Fish and Game Commission Supporting Information for Agassiz's Desert Tortoise or Mojave Desert Tortoise.	CDFW 2020b	Identifies range and distribution, as well as population trends for desert tortoise within the GAI.
Determination of Critical Habitat for the Mojave Population of the Desert Tortoise	FWS 1994	Designates eight critical habitat units in California for desert tortoise, totaling 4,754,000 acres.
*Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*)*	FWS 2011	Recovery Action 2.5, Restrict, designate, close, and fence roads – Identifies priority areas in need of roadside fencing for desert tortoise, which includes parts of US-395, I-40, and SR-247 in the Western Mojave Recovery Unit and US-95, I-10, I-15, I-40, redundant roads within Mojave National Preserve and Joshua Tree National Park, and the Union Pacific Railroad line in the Eastern Mojave and Colorado Desert recovery units.
*Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*)*	FWS 2011	Recovery Action 2.9, Secure lands/habitat for conservation – Recommends conserving sensitive areas that would connect functional habitat or improve management capability of surrounding areas, such as inholdings within tortoise conservation areas that may be open to renewable energy development.
*Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*)*	FWS 2011	Identifies desert tortoise conservation areas, which include "desert tortoise habitat within critical habitat, Desert Wildlife Management Areas, ACEC, Grand Canyon Parashant National Monument, Desert National Wildlife Refuge, National Park Service lands, Red Cliffs Desert Reserve, and other conservation areas or easements managed for desert tortoises."

Document	Reference	Areas of Important Habitat
*Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*)*	FWS 2011	Identifies additional land designations that benefit desert tortoise—see Figure 3 of FWS (2011).
*Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*)*	FWS 2011	Identifies recovery units for desert tortoise that were delineated in the original 1994 recovery plan for the species (Figure 7-1).
Conservation and Land Management Documents	**See below**	**See below**
A Linkage Design for the Joshua Tree – Twentynine Palms Connection	Penrod et al. 2008	Identifies and refines linkages between Joshua Tree National Park and Twentynine Palms Marine Corps Base for a variety of species, including desert tortoise.
A Linkage Network for the California Deserts	Penrod et al. 2012	Identifies and refines linkages in the Mojave Desert for a variety of species, including desert tortoise.
Antelope Valley RCIS (Draft)	ICF 2019	Identifies conservation goals and objectives for desert tortoise including preserving over 15,000 acres of habitat, particularly in the north eastern portion of the Antelope Valley.
Apple Valley Multi-Species HCP/NCCP	Town of Apple Valley pers. comm. April 3, 2020	Centered in the intersection of three landscape-scale linkages that are important for regional connectivity and movement of species on an individual- and population-level (i.e., genetic). The linkages are: The San Bernardino-Granite Mountain Linkage, the Wild Wash Linkage, and the Mojave River Corridor.
CDFW BIOS ACE Terrestrial Connectivity Map (ds2734)	CDFW 2020	Identifies connectivity features for terrestrial wildlife within the GAI.
CEHC	Spencer et al. 2010	Identifies Natural Landscape Blocks and Essential Connectivity Areas in the Mojave Desert Ecoregion.

Document	Reference	Areas of Important Habitat
California Wildlife Movement Barrier Priorities 2020 Map (ds2867)	CDFW 2020c	Within the GAI, identifies Cajon Pass (the junction of Interstate 15 and California State Route 138 on Figure 1-3) as a wildlife passage priority for mule deer, mountain lion, bear, and bighorn sheep, a special status species. The SHOPP Ten-Year Book does not include transportation projects in this area. Priority passage locations for desert tortoise and other special status species that share their habitat were not identified.
Coachella Valley Multiple Species HCP/NCCP	Coachella Valley Association of Governments 2007	Identifies Conservation Areas and Existing Conservation Lands in the HCP Reserve System.
DRECP Land Use Plan Amendment	BLM 2016[a]	Identifies ACEC within the Mojave Desert region. Identifies desert tortoise habitat potential, linkages, and desert tortoise conservation areas, high-priority habitat, and key linkage areas.
DRECP Land Use Plan Amendment Ecoregion Descriptions and Maps	Appendix A of BLM 2016	Identifies California Desert National Conservation Lands (CDNCL) within the DRECP area.
Lower Colorado River Multi-Species Conservation Program HCP	Jones & Stokes 2004	Identifies nine conservation areas established as part of the Lower Colorado River Multi-species HCP.
Mojave Desert Ecoregional Assessment	Randall et al. 2010	Identifies ecologically core, ecologically intact, moderately degraded, and highly converted lands as well as land ownership data and connectivity data.
San Bernardino County RCIS (Draft)	Dudek 2018	Identifies focal species habitat areas, habitat linkages, and conservation priority factors.
Strategic Growth Councils' Mojave Regional Conservation Assessment	In preparation	Not available—this document is currently in preparation.

Document	Reference	Areas of Important Habitat
SWAP	CDFW 2015	Identifies shadscale-saltbush scrub as a conservation target, which is also a desert tortoise habitat type.
West Mojave Plan	BLM 2019	Identifies the establishment of four tortoise conservation areas, Desert Wildlife Management Areas, also referred to as Desert Tortoise Areas of Critical Environmental Concern.

[a] The DRECP was originally developed by multiple agencies as an HCP, NCCP, and BLM land use plan. However, the HCP and NCCP components were not pursued, and the DRECP was only adopted by BLM as a land use plan (BLM 2016). Nevertheless, information and data collected for the DRECP were used to inform the foundational biological components of the Antelope Valley RCIS that is discussed later in this chapter (Desert and Mountain Conservation Authority 2017).

7.5.2. Invasive Species

Desert tortoise habitats, such as desert washes, have been invaded by several species of nonnative plants. Ongoing or proposed human disturbance, such as roads and urbanization, provide an opportunity to transport new invasive species into these habitats, as described in *Enhancing and Restoring Habitat for the Desert Tortoise* (Abella and Berry 2016). Invasive plant species can form monoculture stands, outcompete native plant species for resources (Abella and Berry 2016), and reduce habitat quality. In addition, land management practices that include herbicide treatments to reduce nonnative species can harm desert tortoises foraging on these species, depending on the timing or application methods used.

7.5.3. Disease or Predation

The effect of disease on desert tortoise is not quantified but is considered a substantial threat. Several diseases are known to affect desert tortoises; however, the upper respiratory tract disease caused by Mycoplasma bacteria is the most important (FWS 2011) because of the number of deaths it has caused. Environmental contaminants may directly cause disease or increase the desert tortoises' susceptibility to infectious disease (FWS 2011).

Predation is known to occur on both adult and juvenile, including hatchling, desert tortoises. Ravens are the most visible predator on juveniles and hatchlings, whereas coyotes are known to predate adult tortoises. While these two species are implicated in the majority of desert tortoise mortalities from predation, many other species are known to predate desert tortoise individuals, including domesticated and feral dogs (FWS 2011). The effects of predation can be increased by human activity; increased trash and perching substrates associated with development can attract predators such as ravens (FWS 2011), and roads may contribute to indirect effects on desert tortoise when they serve as corridors for predator dispersal (Boarman 2002).

7.5.4. Climate Change and Drought

While little is known regarding specific direct effects of climate change on desert tortoise or its habitat, predictions can be made based on observation and modeling (FWS 2011). Models performed at Columbia University show an expected increase in summer temperatures and decrease in precipitation (Seager et al. 2007, as cited in Lovich et al. 2014) over the twenty-first century. Recent modeling conducted by the Alfred Wegener Institute has shown that temperatures within desert tortoise habitat are expected to rise, and elevated levels of CO_2 and altered precipitation regimes are expected by 2099 (FWS 2011). Specifically, a decrease in winter rains is anticipated, which may lead to a decrease in the growth of the preferred food source of desert tortoise. This combination of higher average temperatures, elevated CO_2, and altered precipitation regime is also likely to facilitate invasive plant species biomass, which could increase the fire frequency (see discussion below). The effects of increased nitrogen deposited by dust from metropolitan areas may lead to an increase in plant growth, whereas nitrogen released from soils because of increased temperatures may reduce the fertility of these

soils and their ability to support plant life (FWS 2011). Droughts may be exacerbated by climate change and result in less water available for wildlife or for food source plants, resulting in higher mortality (FWS 2011).

Figure 7-2 shows desert tortoise connectivity in the GAI, including core and patch habitat areas, as well as landscape blocks and linkage design for the California Desert Linkage Network (Penrod et al. 2012), and these areas are expected to provide opportunities for desert tortoise to respond to climate change stress by preserving large blocks of habitat and linkage areas that will allow desert tortoises to migrate toward more suitable habitat as the climate changes. Figure 2-6 depicts the terrestrial climate change resilience rank from the ACE dataset (CDFW 2018a). Generally speaking, the predicted climate resilience of the GAI ranges from areas with low resilience, located primarily in the lower-elevation southeastern, western, central, and northern parts of the GAI, to areas with high resilience, located primarily in the higher-elevation central and northeastern parts of the GAI.

7.5.5. Fire

Increased frequency of wildfire resulting from the invasion of desert habitats by nonnative plant species is a known threat to the species (FWS 2011). This can be expected to become a larger problem because of climate change and the continued increase of nonnative grass species that are fire prone. Additionally, nonnative, invasive grasses may out-compete native plants in a post-fire landscape and convert native habitat to nonnative grassland, potentially resulting in an increased recurrence of fire (Brooks and Pyke 2001).

7.6 Multi-species Benefits

While desert tortoise was identified as the species of mitigation need for this GAI, several other special-status species share habitat with desert tortoise could potentially be affected by Caltrans transportation projects that will need compensatory mitigation to satisfy permit conditions. Advance mitigation planning provides Caltrans an opportunity to integrate the protection and preservation of multiple California native plants, biodiversity, and ecosystems into project scoping. Figure 7-3 illustrates the regional terrestrial biodiversity in the GAI, according to CDFW's ACE GIS dataset. According to these data, high to moderate terrestrial biodiversity is present along much of the State Highway System with SHOPP and STIP-eligible projects. Habitats are mapped in Appendix C, and the other special-status species that may occur in these habitats are provided in Appendix D.

As described in Chapter 4, four HCPs and HCP/NCCPs that cover multiple species occur within the GAI (three approved and one in progress). While the primary purpose of these plans is to provide benefit to the focal species addressed in each plan through acquisition, protection, and restoration of focal species habitat, these actions will benefit a variety of species that utilize these habitats. The Apple Valley MSHCP/NCCP (Figure 4-1) is a multi-species conservation plan. Modeled desert tortoise habitat comprises 60% of the Plan Area and the desert scrub natural community comprises 80% of the Plan Area. By protecting a portion of this habitat, other species such as Mohave ground squirrel will benefit from resulting restoration or land acquisition.

Figure 7-1. Desert Tortoise Recovery Units

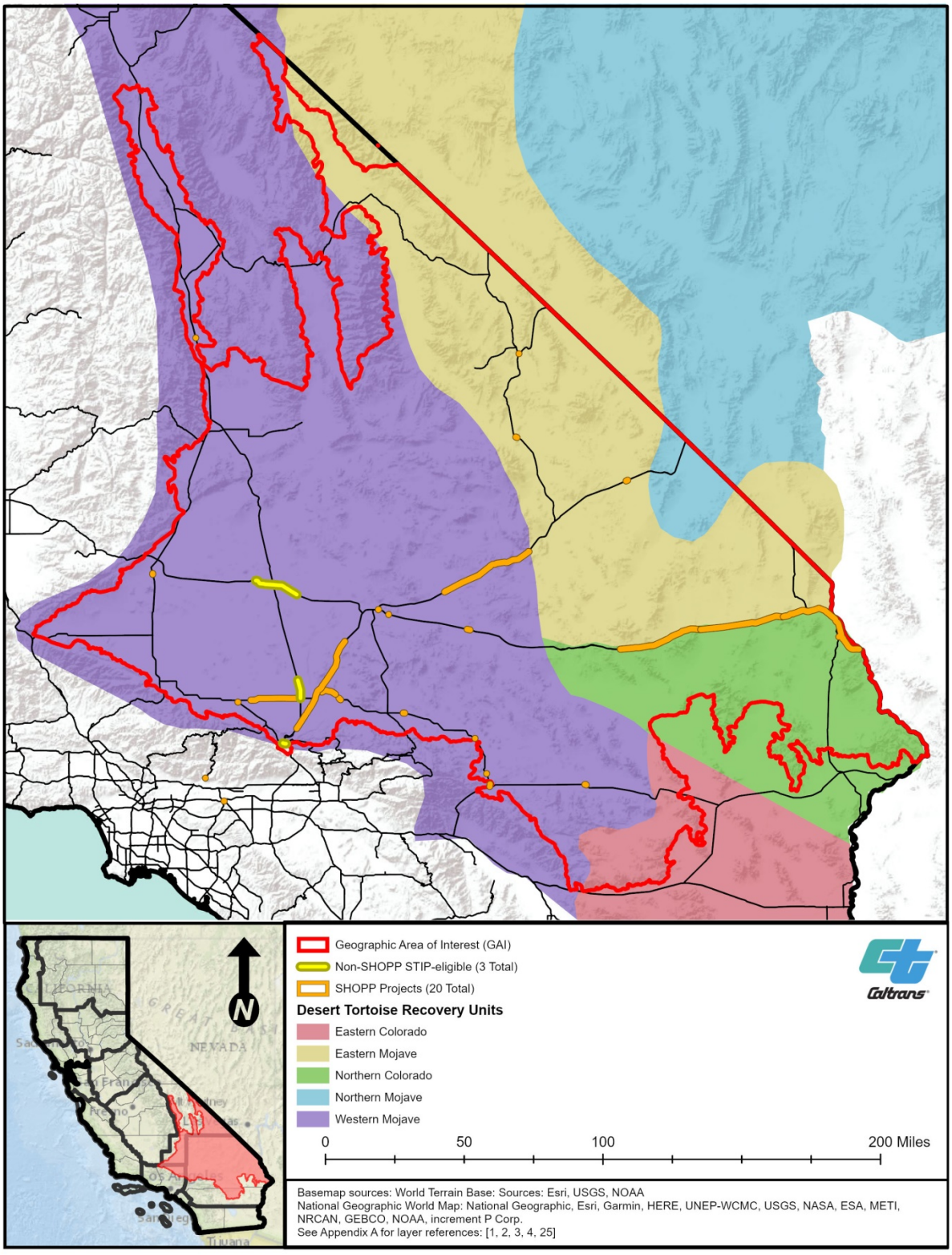


Figure 7-2. Desert Tortoise Connectivity

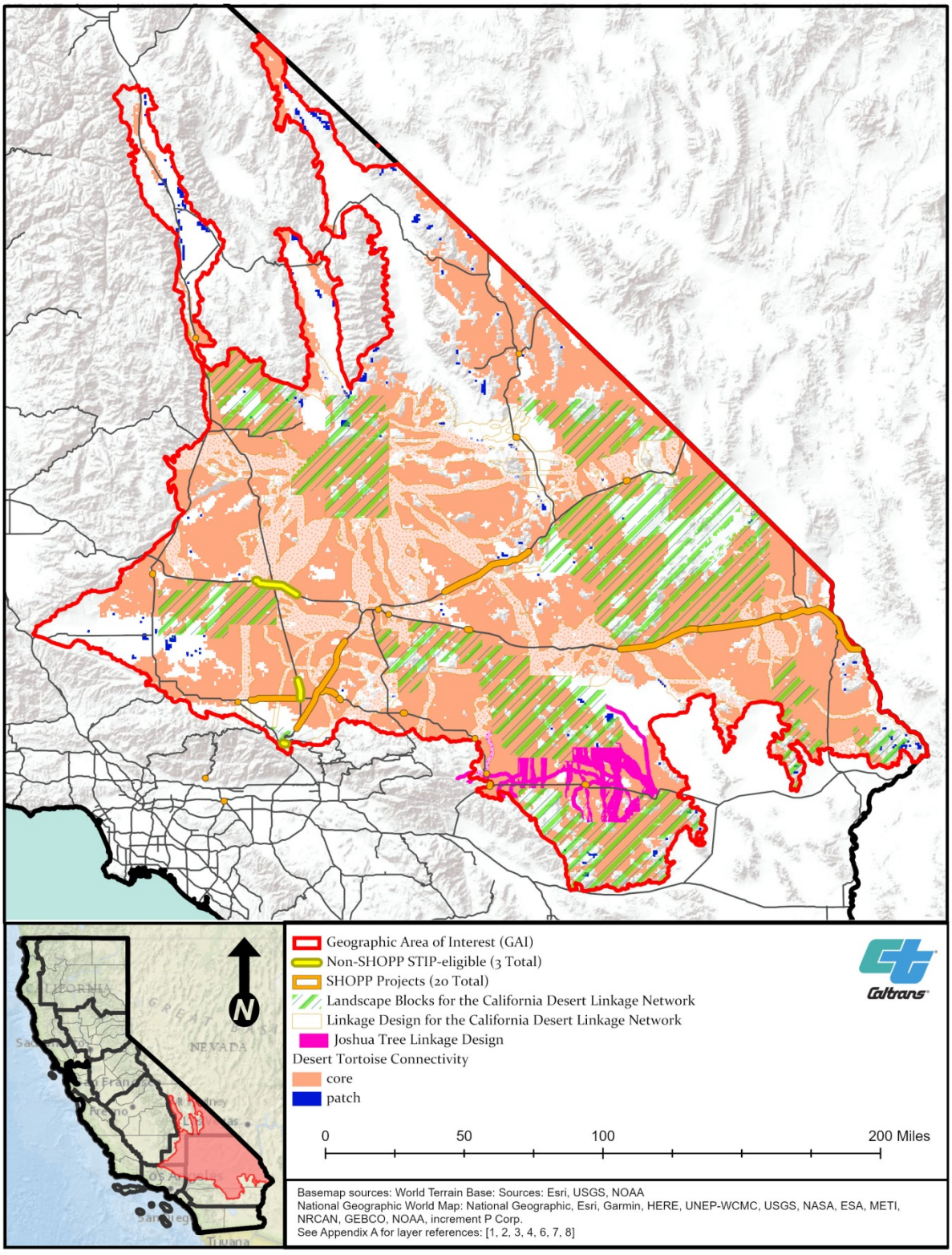
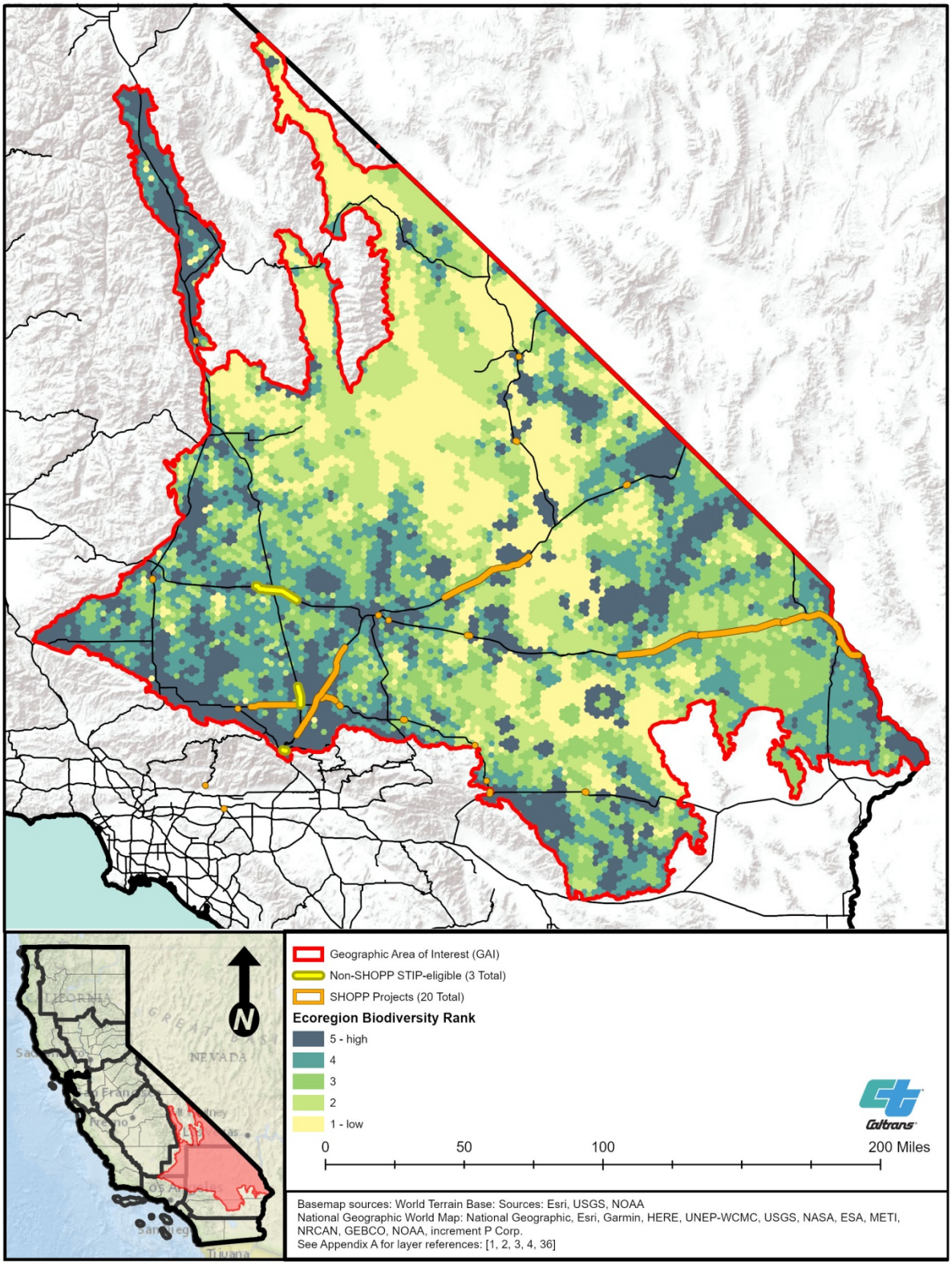


Figure 7-3. Terrestrial Biodiversity



Other efforts, such as planting Caltrans easements with species beneficial to pollinators, are expected to contribute to biodiversity protection and enhancement in the GAI. For example, Caltrans is currently entering into a candidate conservation agreement, with assurances, with FWS to plant species beneficial to monarch butterflies, as well as other pollinators. Once approved, the agreement would allow FWS to issue an enhancement of survival permit under Section 10(a)1(A) of the ESA. While it is anticipated that District 8 will be part of this agreement, it has not been formally approved at this point. In addition, reducing invasive plant infestations and reducing fire risks are co-benefits of planting native plants in Caltrans easements. One or both of those factors can be associated with roadways, depending on location. Advance mitigation purchased or established to address anticipated unavoidable impacts on desert tortoise 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 project 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 resource and regulatory agencies for the desert tortoise, address desert tortoise pressures and stressors, and support desert tortoise population recovery and success in the GAI. Each conservation goal is supported by one or more conservation objectives; objectives are more specific, measurable, achievable, relevant, and time-bound measures that align to a desired result specified by a goal. At the broad scale, these 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 scoping toward those authorized actions that would create the greatest functional lift[3] or conservation benefit for the desert tortoise in the GAI. Sub-objectives also capture specific measures from conservation and land management plans that address threats to the desert tortoise.[4] 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.

[3] For the purposes of this document, “functional lift” means the difference between an existing degraded condition and a restored or enhanced condition.
[4] Standard best management practices will be followed on all Caltrans transportation projects. However, these are not part of the goals and objectives for the AMP.

Table 7-3. Advance Mitigation Conservation Goals and Objectives for Desert Tortoise

Objective	Sub-Objective	Alignment with Conservation and Management Plans[a]
Goal WILD-1: Conserve and expand existing desert tortoise habitat in the GAI	See below	See below
Objective WILD-1.1: Acquire, protect, restore, and/or enhance existing desert tortoise habitat.	**Sub-Objective WILD-1.1.1:** Identify habitat for desert tortoise in the GAI and acquire, protect, restore, and/or enhance this habitat such that the greatest functional life to desert tortoise is provided. **Sub-Objective WILD-1.1.2:** Prioritize key areas, designated critical habitat, and/or areas that provide a buffer to key areas or critical habitat.	• *SWAP* (CDFW 2015) • *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* (FWS 2011) • *Mojave Desert Ecoregional Assessment* (Randall et al. 2010) • *Lower Colorado River Multi-Species HCP* (Jones & Stokes 2004) • *West Mojave Plan* (BLM 2005) • *DRECP Land Use Plan Amendment* (BLM 2015) • *BLM Bakersfield Resource Management Plan* (BLM 2014) • *Antelope Valley RCIS(Draft)* (ICF 2019) • Apple Valley Multi-Species HCP/NCCP (in progress)
See above	**Sub-Objective WILD-1.1.3:** Prioritize acquisition, protection, and/or enhancement of SWAP (CDFW 2015) conservation target shadscale-saltbush scrub habitat, as shown on Figure 7-4.	• *SWAP* (CDFW 2015)

Objective	Sub-Objective	Alignment with Conservation and Management Plans[a]
Goal WILD-2: Preserve, enhance, and increase connectivity between blocks of desert tortoise habitat	See below	See below
Objective WILD-2.1: Acquire, protect, restore, and/or enhance desert tortoise corridors.	**Sub-Objective WILD-2.1.1:** Identify movement corridors for desert tortoise in the GAI and acquire, protect, restore, and/or enhance desert tortoise corridors such that the greatest functional lift for desert tortoise is provided. **Sub-Objective WILD-2.1.2:** Prioritize habitat in key desert tortoise linkage areas, between habitat areas, and/or areas that provide a buffer to key desert tortoise corridors. **Sub-Objective WILD-2.1.3:** Incorporate and consider bridges and culverts when enhancing desert tortoise passage.	• *SWAP* (CDFW 2015) • *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* (FWS 2011) • *Mojave Desert Ecoregional Assessment* (Randall et al. 2010) • *West Mojave Plan* (BLM 2005) • *DRECP Land Use Plan Amendment* (BLM 2015) • *CEHC* (Spencer et al. 2010) • *BLM Bakersfield Resource Management Plan* (BLM 2014) • *Antelope Valley RCIS(Draft)* (ICF 2019) • Apple Valley Multi-Species HCP/NCCP (in progress)

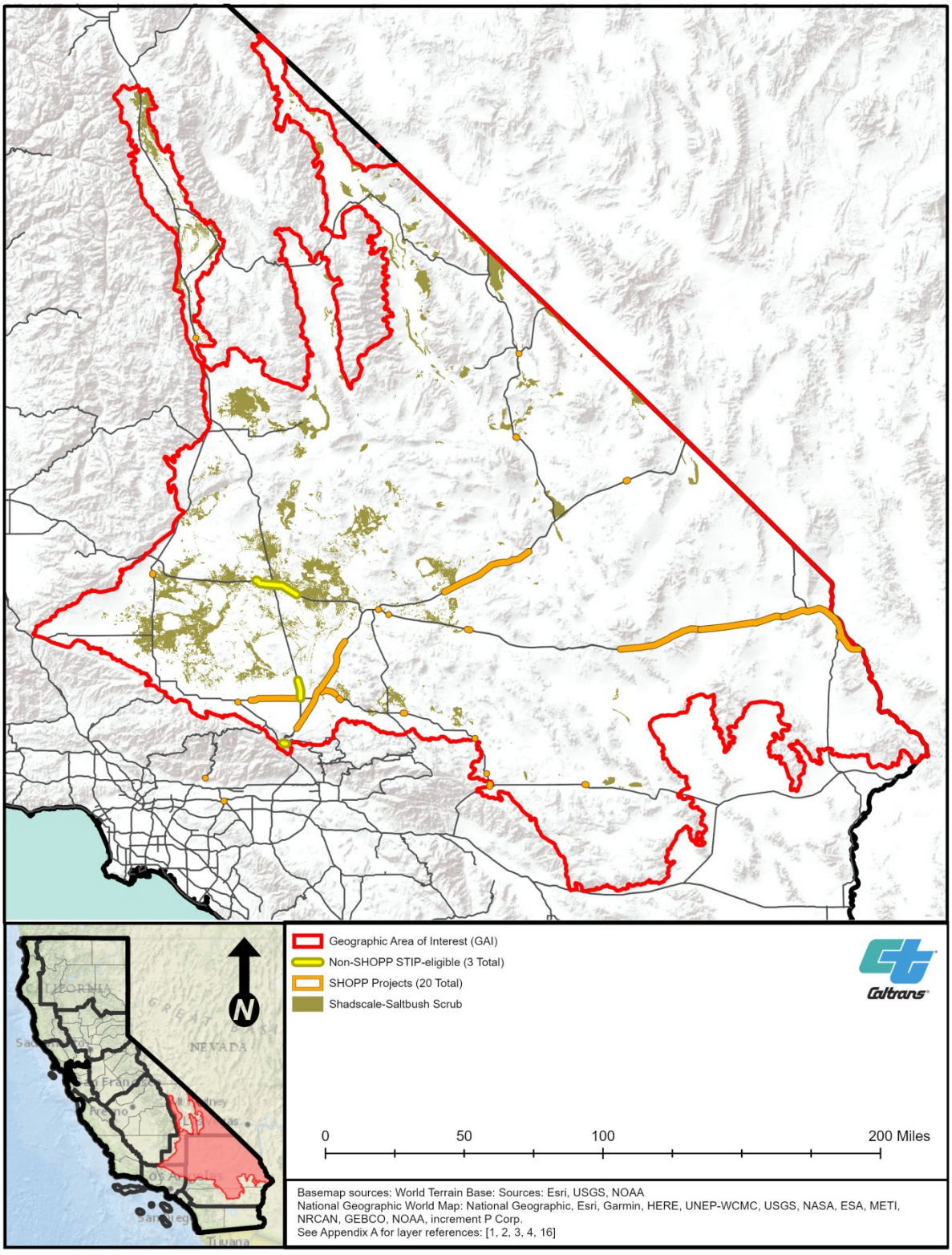
Objective	Sub-Objective	Alignment with Conservation and Management Plans[a]
Goal WILD-3: Support climate resiliency	See below	See below
Objective WILD-3.1: Acquire, protect, restore, and/or enhance habitat that supports climate resilience.	**Sub-Objective WILD-3.1.1:** Identify habitat critical for climate resilience for desert tortoise in the GAI and acquire, protect, restore, and/or enhance this habitat. **Sub-Objective WILD-3.1.2:** Prioritize management of invasive species in key areas, such as movement corridors, that may be exacerbated by climate change such that the greatest functional lift for desert tortoise in provided. **Sub-Objective WILD-3.1.3:** Prioritize restoration and enhancement of habitat at the edges of the desert tortoise's known range.	• *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* (FWS 2011) • *West Mojave Plan* (BLM 2005) • *DRECP Land Use Plan Amendment* (BLM 2015) • *CEHC* (Spencer et al. 2010) • Apple Valley Multi-Species HCP/NCCP (in progress)
Goal WILD-4: Decrease desert tortoise mortality	See below	See below
Objective WILD-4.1: Reduce impacts of invasive species on desert tortoise populations.	**Sub-Objective WILD-4.1.1:** Eradicate invasive species in key desert tortoise habitat locations such as within Desert Wildlife Management Areas, critical habitat, and/or in areas that provide a buffer to high-value desert tortoise habitat. Prioritize areas where invasive species eradication would provide the greatest functional lift to desert tortoise and its habitat. **Sub-Objective WILD-4.1.2:** Prioritize restoration of native plant species in key target areas such as within Desert Wildlife Management Areas, critical habitat, and/or in areas that provide a buffer to high-value desert tortoise habitat.	• *SWAP* (CDFW 2015) • *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* (FWS 2011) • *Mojave Desert Ecoregional Assessment* (Randall et al. 2010) • *West Mojave Plan* (BLM 2005) • *DRECP Land Use Plan Amendment* (BLM 2015) • *BLM Bakersfield Resource Management Plan* (BLM 2014)

Objective	Sub-Objective	Alignment with Conservation and Management Plans[a]
Objective WILD-4.2: Reduce predation impacts on desert tortoise.	**Sub-Objective WILD-4.2.1:** Reduce predation on desert tortoise by reducing perches for ravens and other science-supported actions.	• *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* (FWS 2011) • *West Mojave Plan* (BLM 2005) • *DRECP Land Use Plan Amendment* (BLM 2015)
Objective WILD-4.3: Reduce road-associated mortality.	**Sub-Objective WILD-4.3.1:** Identify State Highway System crossing areas for desert tortoise in the GAI and establish safe crossings. **Sub-Objective WILD-4.3.2:** Identify safe State Highway System crossing areas for desert tortoise in the GAI and direct desert tortoise to safe crossings.	• *Revised Recovery Plan for the Mojave Population of the Desert Tortoise* (FWS 2011) • *West Mojave Plan* (BLM 2005) • *DRECP Land Use Plan Amendment* (BLM 2015)

Objective	Sub-Objective	Alignment with Conservation and Management Plans[a]
Goal 5: Provide multi-species benefits	See below	See below
Objective WILD-5.1: Acquire, protect, restore, and/or enhance habitat that provides multi-species benefits.	**Sub-Objective WILD-5.1.1:** Identify priority special-status species conservation goals and objectives within the GAI. **Sub-Objective WILD-5.1.2:** Prioritize mitigation to provide benefits to special-status species that may co-occur with desert tortoise in key habitat types and that will provide functional lift to other special-status species in the GAI. **Sub-Objective WILD-5.1.3:** Identify State Highway System right-of-way areas where enhancement efforts may benefit pollinators, as well as desert tortoise or other priority special-status species.	• *SWAP* (CDFW 2015) • *Mojave Desert Ecoregional Assessment* (Randall et al. 2010) • *West Mojave Plan* (BLM 2005) • *DRECP Land Use Plan Amendment* (BLM 2015) • *CEHC* (Spencer et al. 2010) • *A Linkage Network for the California Deserts* (Penrod et al. 2012) • *Lower Colorado River Multi-Species HCP* (Jones & Stokes 2004) • *San Bernardino County RCIS* (Dudek 2018) • *Coachella Valley Multiple Species HCP/NCCP* (Coachella Valley Association of Governments 2007) • *BLM Bakersfield Resource Management Plan* (BLM 2014) • *Antelope Valley RCIS (Draft)* (ICF 2019) • Apple Valley Multi-Species HCP/NCCP (in progress)

[a] More information on these plans is provided in Chapters 3 and 4.

Figure 7-4. Shadscale-Saltbrush Scrub Habitat



7.8 Summary

Caltrans anticipates that future SHOPP and STIP-eligible transportation projects may be conditioned by CDFW and FWS to address the pressures and stressors that threaten desert tortoise in the GAI. The pressures and stressors include:

- Habitat loss, fragmentation, and degradation;
- Invasive species;
- Disease and predation;
- Climate change and drought; and
- Fire.

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

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

Goals WILD-1 and WILD-2 seek to conserve existing desert tortoise habitat in the GAI and increase connectivity between blocks of desert tortoise habitat. The objectives to fulfill these goals are acquisition, protection, restoration, or enhancement of land, or a combination of these objectives. When establishing mitigation credits, Caltrans intends to prioritize efforts that provide the greatest functional lift for the desert tortoise, and that provide a conservation benefit in terms of size, connectivity, quality, and contribution to the climate resilience of habitat within the GAI. These goals, objectives, and sub-objectives were selected to address habitat loss, fragmentation, and degradation as well as to address impacts from climate change and drought. Further, Caltrans anticipates that actions completed through protection, enhancement, and restoration may also provide opportunities to address invasive species, predation, and road-associated mortality. Because fire in the GAI is primarily related to invasive plant species, any strategy that addresses invasive species will affect that pressure and stressor as well.

Goal WILD-3 seeks to support climate resiliency for desert tortoise within the GAI. The primary objectives are to reduce impacts on desert tortoise from climate change by increasing the protection and functionality of land that is identified as crucial for climate resiliency, such as corridors that provide the ability for desert tortoises to migrate from areas of low climate resilience into areas with higher resilience; addressing the climate change-related threat from invasive species; and implementing measures that would protect the State Highway System against the effects of climate change. In addition to addressing climate change in general, these goals and objectives also address habitat loss, fragmentation, and degradation; invasive species; and fire.

Goal WILD-4 seeks to decrease desert tortoise mortality from known immediate and ongoing threats to individuals or populations through protecting native vegetation, reducing conditions that favor predators, and protecting desert tortoise from road-associated mortality. These objectives address issues related to habitat loss, fragmentation, and degradation, and threats from invasive species and predation.

Goal WILD-5 seeks to guide project scoping to prioritize multi-species benefits. Advance mitigation provides the opportunity to maximize Caltrans' benefit to conservation in the GAI, including to species other than desert tortoise. Goal WILD-5 was developed to include conservation for multiple species as well as provide desert tortoise compensatory mitigation.

Each of the goals and objectives have sub-objectives intended to further guide advance mitigation project scoping toward resource and regulatory agencies' goals and objectives. 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 project scoping to set the stage, once funding is received, for specific advance mitigation projects to provide a functional lift for the desert tortoise and other special status species, and maximize conservation benefits from mitigation within the GAI.

8. AQUATIC RESOURCES CONSERVATION GOALS AND OBJECTIVES

Caltrans' primary objective for aquatic resources is to avoid and minimize all impacts on fish, wetlands, and waters from Caltrans transportation projects in the GAI. However, sometimes compensatory mitigation is needed. Credits or values established through SHC § 800.6(a)-authorized advance mitigation projects offer the unique opportunity to consolidate needed mitigation to provide strategically placed and environmentally sound restoration and enhancement and to provide an improved environmental outcome that may not be available through the usual transportation project-by-project approach to mitigation.

Caltrans seeks to align its advance mitigation projects with resource and regulatory agencies' conservation goals and objectives, and to contribute to an improved environmental outcome in the GAI. With this in mind, in this chapter Caltrans presents its understanding of resource and regulatory agencies' regional conservation goals and objectives that could apply to aquatic resources forecast to be potentially affected by SHOPP and STIP-eligible transportation projects, as discussed in Chapters 5 and 6.

The goals and objectives assembled in this chapter are intended to guide advance mitigation project 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 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 resource and 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 regulatory requirements and conservation science. To determine the aquatic resource conservation goals and objectives applicable to the GAI, Caltrans:

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

- First identified resource and regulatory agencies with the authority to include aquatic resource-related compensatory mitigation as a transportation project permit condition;
- Next, for the aquatic resources of the GAI's sub-basins evaluated through the SAMNA, Caltrans identified:
  - Federal and state policies, and binding and non-binding regional conservation and land management plans, relevant to aquatic resources in the GAI;
  - Current and projected pressures and stressors on aquatic resources, including climate resiliency;
  - Opportunities to enhance the conservation benefits for aquatic resources from advance mitigation projects; and/or
  - Opportunities to provide additional benefits, where possible, to water quality, groundwater recharge, and species that require aquatic habitats.
- Last, Caltrans analyzed the aforementioned data in relation to the transportation-related activities that could potentially affect aquatic resources, and the potential range of compensatory mitigation that could satisfy a transportation project permit condition associated with the activities.

The results of this analysis are the advance mitigation conservation goals and objectives discussed in this chapter.

8.2 Resource and Regulatory Agencies with Jurisdiction over Aquatic Resources

Table 8-1 lists the resource and regulatory agencies with jurisdiction over aquatic resources in the GAI who have the authority to require aquatic resource-related compensatory mitigation for transportation projects. Streams, wetlands, and other aquatic resources are also used by wildlife species that are under the jurisdiction of other resource and regulatory agencies; this RAMNA evaluates compiles goals and objectives for wildlife resources separately in Chapter 7.

Table 8-1. Agencies with Jurisdiction over Aquatic Resources

Agency	Summary
CDFW – Region 4, Central; Region 5, South Coast; and Region 6, Inland Deserts	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. 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.
EPA – Region 9	EPA has authority under the federal 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 the discharge of dredge or fill material into WOTUS. Federal authorizations also need to be reviewed for compliance with CWA Section 401.
State Water Board and RWQCB – Region 6, Lahontan; and Region 7, Colorado River	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 Water Boards, 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. Projects that occur in one region are regulated by that regional board, whereas projects that cross regions are regulated by the State Water Board.
Corps – South Pacific Division, Los Angeles District	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 Corps' civil works projects are proposed to be used or altered by another entity, CWA Section 408 permission (33 U.S.C. 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. It is the preference of the Corps to use the following order of priority for mitigation: mitigation bank, in-lieu fee program, on-site permittee responsible mitigation, and off-site permittee responsible mitigation.

Agency	Summary
FWS	FWS has jurisdiction over all federally protected wildlife species and critical habitats, and requires consultation and coordination to be in compliance with the ESA. FWS authorities, including its role in mitigation, are codified under multiple statutes that address management and conservation of natural resources from many perspectives, including, but not limited to, the effects of land, water, and energy development on fish, wildlife, plants, and their habitats. FWS approves HCPs to address impacts on federally protected species, for projects lacking a federal nexus, under ESA Section 10(a)1(B). For projects with a federal nexus and potential impacts on federally protected species, FWS issues biological opinions under ESA Section 7.

8.3 Aquatic Resources Overview

An overview of aquatic resources is provided in Chapter 2. The Mojave and Amargosa Rivers are the major river systems of the GAI (Section 2.10, Appendix F). Additionally, there are thousands of named and unnamed tributaries, most of which flow into terminal lakes or the Gulf of California. Flow into these systems originates as rainfall or snowmelt from isolated desert mountains and the San Bernardino Mountains.

Although the GAI overlaps 15 HUC-8 sub-basins, the Mojave (HUC-8 18090208) of the Lahontan Region and the Southern Mojave (HUC-8 18100100) of the Colorado River Region (Tables 2-5 and 2-6, respectively) overlap desert tortoise habitat, where mitigation is forecast by Caltrans to be needed. Aquatic habitat types with the potential to occur in the GAI are mapped in Appendix F. Based on the SAMNA's wetlands and Waters layers, the Mojave HUC-8 has a total of 55,500 acres of aquatic habitat, primarily consisting of Riverine, Lake, Freshwater Pond, and Freshwater Forested/Shrub Wetland aquatic habitats, with the remaining aquatic habitat types making up less than 1 percent of the total (Table 2-9, Caltrans 2017c, 2017d). The South Mojave HUC-8 has a total of 39,619 acres of aquatic habitat, primarily consisting of Riverine, Lake, Playa, Freshwater Pond, and Freshwater Forested/Shrub Wetland aquatic habitats, with the remaining aquatic habitat types making up less than 1 percent of the total (Table 2-10, Caltrans 2017c, 2017d). Beneficial uses that support the preservation and enhancement of wildlife habitat and aquatic resources and the AMP's objective to protect natural resources through transportation project mitigation include cold freshwater habitat; flood peak attenuation/floodwater storage; freshwater replenishment; groundwater recharge; inland saline water habitat; migration of aquatic organisms; preservation of habitats of special significance; preservation of rare, threatened, or endangered species; spawning, reproduction, and development; water quality enhancement; and wildlife habitat (Table 2-7).

8.4 Regional Conservation Efforts

References relevant to scoping advance mitigation projects in the Caltrans District 8 GAI are listed in Chapters 3 and 4. Of these documents, several identify key habitats, specific designated waters, or areas for aquatic resource enhancement and restoration

(Table 8-2). Others identify key qualities, such as water quality, that are essential for aquatic resource enhancement and restoration. The documents also include strategies for aquatic resource protection and measures to address specific known, ongoing threats to aquatic resources. Watershed plans developed in accordance with or consistent with Corps or State Water Board guidance were not found for this GAI. Caltrans will use this information during advance mitigation project scoping to help mitigation efforts in the GAI align with the goals and objectives of resource and regulatory agencies that approve mitigation.

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 or indirectly from negative impacts of pressures (e.g., habitat fragmentation)” (CDFW 2015). The Corps defines human stressors as human-caused sources of disturbance within 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 STIP, and the four pressures and stressors that are likely to be affected by these transportation projects are evaluated in this document and discussed below.

8.5.1. Habitat Loss, Fragmentation, and Degradation

Urbanization and other anthropogenic factors such as roads, poor grazing practices, and habitat invasion by nonnative species have led to the loss and degradation of aquatic resources. Additionally, roads and urbanization may fragment habitat, impede connectivity between populations, impede connectivity between habitats used during different life stages, contribute to nonpoint source pollution from chemicals and toxins, or alter local hydrology by changing sheet flow and altering water movement in drainages.

Table 8-2. Documents Identifying Aquatic Resources 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 FR 19670	Corps' ruling to establish standards and criteria for the use of all types of compensatory mitigation, including on-site and off-site permittee-responsible mitigation, mitigation banks, and in-lieu fee mitigation to offset unavoidable impacts on WOTUS. Recognizes that consolidating mitigation may be environmentally preferable for linear projects (as advance or at least concurrent compensatory mitigation is environmentally preferable - but that is not always possible to achieve) (Preamble and 33 section 332.3).
303(d) List of Impaired Water Bodies	State Water Board 2018	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 (Table 2-8), 10 waterbodies are listed as impaired in the GAI. Of the 10, only the Haiwee Reservoir (HUC-8 18090103) has an established TMDL.
California Wetlands Conservation Policy	Executive Order W-59-93	The "No Net Loss Policy" for wetlands aims to "[e]nsure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship and respect for private property."
Final 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.
National Wetlands Mitigation Action Plan	EPA and Corps 2002	EPA and Corps comprehensive, interagency document to further achievement of the goal of no net loss of wetlands and sets forth the no net loss policy.
Staff Report on Developing a Climate Change Mitigation and Adaptation Strategy for the Lahontan Region	Lahontan RWQCB 2019b	States that proactively addressing climate change is a RWQCB top priority, with implementation through the RWQCB's planning and regulatory programs. Actions to address climate change relevant to this RAMNA include increasing wetland, headwaters, and floodplain restoration.

Document	Reference	Information Identified
State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State	State Water Board 2019a	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 Basin Region	Colorado River RWQCB 2019	Identifies water quality objectives and beneficial uses for the Colorado basin.
Water Quality Control Plan for the Lahontan Region	Lahontan RWQCB 2016	Identifies water quality objectives and beneficial uses for the Lahontan basin.
Conservation and Land Management Documents	See below	See below
Antelope Valley RCIS	ICF 2019	Includes a goal to enhance aquatic habitats to benefit focal species as well as goals and objectives for the following focal species that use aquatic habitat, note this document covers an area that is outside of the Mojave and Southern Mojave HUC-8's; • Alkali mariposa lily (*Calochortus striatus*) – preserve at least 12,360 acres of potential habitat and enhance Little Rock Wash (HUC-8 18090206). • Spreading navarretia (*Navarretia fossalis*) – enhance existing habitat and spread the population to additional suitable habitat. • Western pond turtle (*Emys marmorata*) – enhance ponds, wetlands, and streams where the western pond turtle is known to occur and increase habitat connectivity • LeConte's thrasher (*Toxostoma lecontei*) – protect at least 53,253 acres of potential habitat and exclude recreation vehicle use in wash areas of dense shrub growth. • Least Bell's vireo (*Vireo bellii pusillus*) – protect at least 2,352 acres of potential habitat and enhance existing habitat • Northern harrier (*Circus hudsonius*) – preserve at least 236 acres of potential habitat • Tricolored blackbird (*Agelaius tricolor*) – preserve 71,962 acres of foraging habitat and enhance existing habitat • Willow flycatcher (*Empidonax traillii*) – preserve 1,165 acres of potential habitat, restore aquatic features where the species is known to occur

Document	Reference	Information Identified
Apple Valley MSHCP/NCCP	Town of Apple Valley pers. comm. April 3, 2020	The reach of the Mojave River that falls within the *Apple Valley MSHCP/NCCP* contains the Upper Narrows, one of the few places where water is present year-round. The Upper Narrows is a biologically diverse area and provides critical riparian habitat for a variety of residential and neotropical migrating birds.
Coachella Valley Multiple Species HCP/NCCP	Dudek 2014	Targets the following aquatic habitats for conservation: desert saltbush scrub, desert sink scrub, Sonoran cottonwood-willow riparian forest, desert dry wash woodland, desert fan palm oasis woodland, and arrowweed scrub. Targets the following species that use aquatic habitats for conservation of habitat: desert pupfish (*Cyprinodon macularius*), southwestern willow flycatcher (*Empidonax traillii extimus*), yellow breasted-chat (*Icteria virens*), arroyo toad (*Anaxyrus californicus*), Crissal thrasher (*Toxostoma crissale*), summer tanager (*Piranga rubra*), Le Conte's thrasher, least Bell's vireo (*Vireo bellii pusillus*), yellow warbler (*Setophaga petechial*), Yuma Ridgway's rail (*Rallus obsoletus yumanensis),* California black rail (*Laterallus jamaicensis coturniculus*), Western yellow bat (*Lasiurus xanthinus*), and Palm Springs round-tailed ground squirrel (*Xerospermophilus tereticaudus chlorus*).
DRECP Land Use Plan Amendment	BLM 2016	Identifies a number of goals and objectives for managing BLM lands in the California desert. Those pertinent to aquatic resources include: • Maintain natural surface and groundwater processes for riparian, playa, seep, spring, and desert wash habitats • Restore natural flow regimes • Maintain floodplain processes to the 100 year floodplain • Reduce the overall population of tamarix, giant reed, and Russian thistle (*Salsola* spp.) The BLM manages its Areas of Critical Environmental Concern through appendixes to this document. A total of 54 of these areas occur in the GAI portion of the Mojave and Southern Mojave HUC 8's, all of which have unique goals and objectives.
Final Mojave Integrated Regional Water Management Plan	Mojave Water Agency 2014	Identifies a number of objectives for improving water supplies to the plan region which is approximately the western 1/3rd of the desert region of San Bernardino County. Objectives relevant to this RAMNA include; improve water quality, reduce flood risk, increase water supply, and practice resource stewardship by conducting ecosystem restoration in the Mojave River.

Document	Reference	Information Identified
Lower Colorado River Multi-Species Conservation Program HCP	Jones & Stokes 2004	Targets the following aquatic habitats for restoration: • Cottonwood-willow (5,940 acres) • Honey-mesquite (1,320 acres) • Marsh (512 acres) • Backwater lands including oxbow lakes, abandoned river channel pools, floodplain ponds and lakes, and secondary river channel pools (360 acres) Nine Conservation Areas have currently been established, of which the Mohave Valley Conservation Area (HUC-8 15030101), consisting of 90 acres, occurs in the GAI. Targets the following species that use aquatic habitats for conservation of habitat: Colorado River toad (*Bufo alvarius),* lowland leopard frog (*Rana yavapaiensis),* relict leopard frog (*Rana onca),* western yellow bat, Arizona Bell's vireo (*Vireo bellii arizonae*), southwestern willow flycatcher, Sonoran yellow warbler (*Setophaga petechia sonorana),* yellow billed cuckoo (*Coccyzus americanus occidentalis),* California black rail, Yuma Ridgway's rail, bonytail (*Gila elegans*), flannelmouth sucker (*Catostomus latipinnis*), humpback chub (*Gila cypha*), razorback sucker (*Xyrauchen texanus*), MacNeill's sootywing (*Pholisora gracielae*), northern Mexican gartersnake (*Thamnophis eques*), Colorado River cotton rat (*Sigmodon arizonae*).
San Bernardino County RCIS	Dudek 2018	Draft RCIS includes goals, subject to potential revisions before it is final, to sustain and enhance biodiversity and ecological functions in the following habitats and locations: • Playas in Coyote, Cuddleback, and Harper Dry Lakes (HUC-8 18090207), Rabbit and Lucerne Dry Lakes (HUC-8 18100100), and El Mirage and Troy Dry Lakes (HUC-8 18090208). • Riparian and wetland areas in the Morongo Basin drainages (HUC-8 18100100), Mojave River and tributaries (particularly from Mojave Narrows Regional Park to Helendale), Oro Grande, Little Horsethief Creek, wetlands associated with agriculture fields near El Mirage and Newberry Springs, all of which are in HUC-8 18090208, as well as all seeps and springs, and any other riparian, wetland, wash, or other water feature.

Document	Reference	Information Identified
SWAP	CDFW 2015	Identifies the following aquatic habitats as conservation targets with the following goals; • Desert wash woodland and scrub, increase native habitat area and connectivity by 5 percent from 2015 levels by 2025 • American southwest riparian forest and woodland, increase native habitat area and connectivity by 5 percent from 2015 levels by 2025 • Anthropogenically created aquatic features, increase native habitat area and miles of stable banks by 5 percent from 2015 levels by 2025 • Cienegas, increase native habitat area and river miles by 5 percent from 2015 levels by 2025 • Springs and spring brooks, increase native habitat area, river miles, and connectivity by 5 percent from 2015 levels by 2025 Identifies the following aquatic taxa as species of the greatest conservation need for the GAI (taxa occurring in the Mojave and Southern Mojave HUC-8's are listed in bold): **Saratoga Springs pupfish** (*Cyprinodon nevadensis nevadensis*), **western pond turtle, arroyo toad, springsnails (Hydrobiidae),** Owens speckled dace (*Rhinichthys osculus* ssp. 2), Owens pupfish (*Cyprinodon radiosus*), Cottonball Marsh pupfish (*Cyprinodon salinus milleri*), Owens tui chub (*Siphateles bicolor snyderi*), Shoshone pupfish (*Cyprinodon nevadensis shoshone*).

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. Tamarisk and giant reed are particularly problematic for aquatic resources such as arroyos and streambeds (BLM 2016). Additional non-native plants that infest aquatic resources in the GAI include hydrilla (*Hydrilla verticillata*), creeping water primrose (*Ludwigia hexapetala*), and halogeton (*Haogeton glomeratus*) (Cal-IPC 2020). Tamarisk is drought-tolerant and has a high reproductive capacity, enabling it to outcompete many native riparian species, including cottonwoods and willows (BLM 2016). Both tamarisk and giant reed compete with native plants for water and also increase soil salinity (Randall et al. 2010). Invasive animal species in the GAI include feral goats, horses, sheep, and burros, with burros likely providing the greatest potential threat to aquatic habitats by removing a plant by its roots and by converting herbaceous plant communities, which are more likely to be aquatic, to shrub communities, which are less likely to be aquatic, as observed during a study by CDFW (Weaver 1974).

8.5.3. Soil Compaction, Reduced Water Infiltration, Soil Erosion, and Water Quality Degradation

Activities associated with roadway projects within the GAI may disturb desert soils. Organic complexes of biological soil crusts, mosses, algae, and cyanobacteria that occur in undisturbed upland areas adjacent to ephemeral soils help stabilize desert soils, retain soil moisture, fix carbon and nitrogen, and can stimulate plant growth. Soil disturbance in desert environments causes the loss of these beneficial organic complexes, leading to soil compaction, which reduces infiltration rates (Levick et al. 2008). Disturbed desert soils erode during heavy precipitation events, increasing the sediment load in streams and large rivers, which are often heavily laden with salts and metals, contributing to water quality problems downstream (Belnap 2007).

8.5.4. Climate Change and Drought

Climate and climate resiliency are described in Chapter 2. Global climate models predict air temperatures in the GAI will increase by up to 8 degrees Fahrenheit to 14 degrees Fahrenheit by the end of the century (Hopkins 2018). In *California's Fourth Climate Change Assessment – Inland Deserts Region Report*, Hopkins (2018) predicts that transportation infrastructure such as the State Highway System will experience an increased risk of damage resulting from climate change events associated with severe storms, flash floods that will cause more damage to infrastructure in dry stream beds, higher temperatures, drought, and increased wildfire risk, particularly from lightning, which causes many large fires.[2] The resilience of the GAI to effects resulting from climate

[2] Pressures and stressors associated with wildfire are discussed in Chapter 7 as it pertains to desert tortoise.

change was acquired from CDFW's ACE terrestrial climate change resilience dataset (see Figure 2-6). Generally speaking, the majority of aquatic resources in the GAI are located in areas of moderate to high climate resiliency (3 to 5 ranking). However, some portions of the GAI, especially the lower-elevation southeastern and extreme western portions, show low climate resiliency rankings (1 to 2 ranking). The majority of forecast Caltrans projects are expected to occur in areas of moderate to low climate resilience.

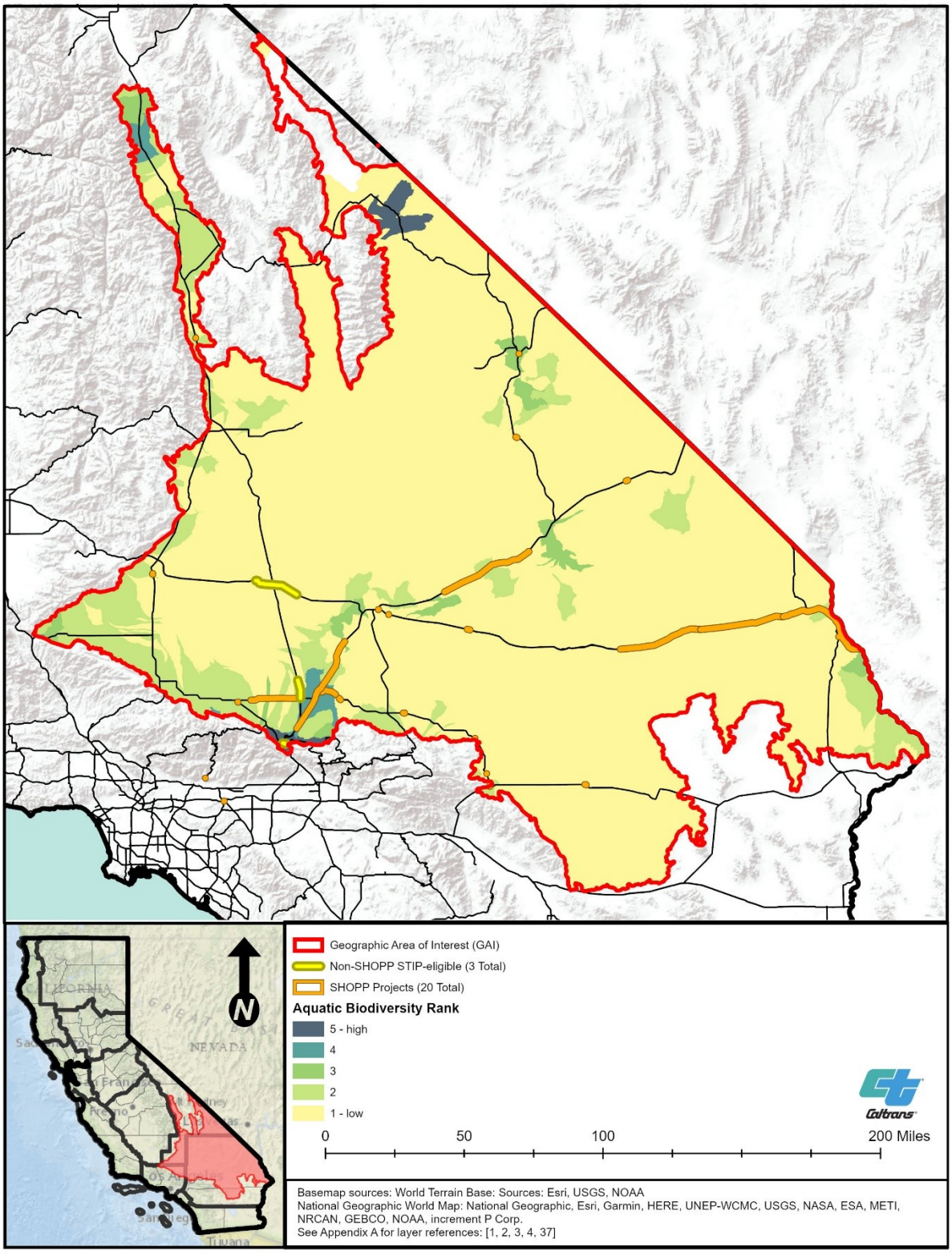
8.6 Multi-resource Benefits

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, special-status species, and water resources.

- Figure 8-1 illustrates the regional aquatic biodiversity in the GAI, as provided by CDFW's ACE GIS dataset. According to these data, low aquatic biodiversity dominates the GAI; however, low to moderate aquatic biodiversity is present along much of the State Highway System where SHOPP- and STIP-eligible projects are planned for the next 10 years, in the Mojave and Southern Mojave HUC-8's.
- 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 intermittent and ephemeral drainages in the GAI provides beneficial uses to surface water functions and values that include groundwater recharge, flood peak attenuation, floodwater storage, and wildlife habitat (BLM 2016; Colorado River RWQCB 2019; Lahontan RWQCB 2016).
- Enhancing and/or restoring the aquatic resources of the GAI is expected to support or contribute to beneficial uses of 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 waterways could sequester contaminants on waterways identified as 303(d) impaired and/or with an established TMDL.

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

Figure 8-1. Aquatic Biodiversity



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 and STIP transportation project compensatory mitigation needs, be consistent with the goals and objectives of resource and 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, and reduce climate change effects on aquatic resources in the GAI. Sub-objectives also capture specific measures from conservation and land management plans that address threats to aquatic resources. Several of the goals are interrelated, and many objectives could apply to more than one goal; objectives were grouped with the goal to which they most specifically aligned. Goals and objectives are generally presented in order from general to more specific.

The goals and objectives presented herein are intended to be supportive of the watershed approach, as practiced by the resource and regulatory agencies. The watershed approach is an analytical process, through which the Corps, State Water Board, 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 resource through strategic selection of compensatory mitigation sites. The Corps subscribes to a watershed approach for compensatory mitigation that uses the HUC-based classification system, or a topographic watershed-based system, depending on the size and location of a [transportation or other] project (Corps 2015). The State Water Board and RWQCBs generally subscribe to an approach for compensatory mitigation decisions that follows the Corps' watershed approach; however, the HU classification system may be used on a case-by-case basis (State Water Board 2019).

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

Objective	Sub-Objective	Alignment with Goals of Documents Identified in Table 8-2 [a]
Goal AR-1: No net loss of area, functions, and values of aquatic resources	See below	See below
Objective AR-1.1: Improve quantity and function of aquatic resources.	**Sub-Objective AR-1.1.1:** Enhance and/or restore aquatic resources such that the greatest functional lift to the aquatic resource is provided, including by consolidating compensatory mitigation. **Sub-Objective AR-1.1.2:** Prioritize enhancement and/or restoration in key areas such as desert wash woodland and scrub, American southwest riparian forest and woodland, cienegas, and springs and spring brooks. **Sub-Objective AR-1.1.3:** Prioritize enhancement, and/or restoration of riparian vegetation to increase connectivity between existing blocks of riparian vegetation, particularly in the Mojave (HUC-8 18090208) and Amargosa Rivers (HUC-8's 18090202 and 18090203). **Sub-Objective AR-1.1.4:** Enhance and/or restore aquatic resource functions, such as connectivity, abundance of native plants, and water quality, that define habitat value for aquatic organisms. **Sub-Objective AR-1.1.5:** Enhance and/or restore playa habitats in Coyote, Cuddleback, and Harper Dry Lakes (HUC-8 18090207), Rabbit and Lucerne Dry Lakes (HUC-8 18100100), and El Mirage and Troy Dry Lakes (HUC-8 18090208).	• *SWAP* (CDFW 2015) • *Final Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division* (Corps 2015) • *State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State* (State Water Board 2019a) • *Coachella Valley Multiple Species HCP/NCCP* (Dudek 2014)*DRECP Land Use Plan Amendment* (BLM 2016) • *Lower Colorado River Multi-Species Conservation Program HCP* (Jones & Stokes 2004) • Draft Antelope Valley RCIS (ICF 2019) • *San Bernardino County RCIS* (Dudek 2018) • *Final Mojave Region Integrated Regional Water Management Plan* (Mojave Water Agency 2014) • *Water Quality Control Plan for the Colorado River Basin Region* (Colorado River RWQCB 2019) • *Water Quality Control Plan for the Lahontan Region* (Lahontan RWQCB 2016)

Objective	Sub-Objective	Alignment with Goals of Documents Identified in Table 8-2 [a]
Goal AR-2: Restore and maintain the chemical, physical, and biological integrity of waters	See below	See below
Objective AR-2.1: Protect and enhance water quality.	**Sub-Objective AR-1.2.1:** Enhance beneficial uses of waters in the GAI through water quality improvements. **Sub-Objective AR-1.2.2:** Prioritize enhancement and/or restoration of resources identified with RWQCB beneficial use designations, such as cold freshwater habitat; flood peak attenuation/floodwater storage; freshwater replenishment; groundwater recharge; inland saline water habitat; migration of aquatic organisms; preservation of habitats of special significance; preservation of rare, threatened, or endangered species; spawning, reproduction, and development; water quality enhancement; and wildlife habitat. **Sub-Objective AR-1.2.3:** Prioritize controlling erosion, nutrients, contaminants, and temperatures in HUC-8s. **Sub-Objective AR-1.2.4**: Improve water quality and reduce impairment of 303(d) pollutants in listed water bodies such as the Haiwee Reservoir (HUC-8 18090103). **Sub-Objective AR-1.2.5:** Enhance and/or restore areas with high water quality protection and remediation values.	• *Water Quality Control Plan for the Colorado River Basin Region* (Colorado River RWQCB 2019) • *Water Quality Control Plan for the Lahontan Region* (Lahontan RWQCB 2016) • *Final Mojave Region Integrated Regional Water Management Plan* (Mojave Water Agency 2014)

Objective	Sub-Objective	Alignment with Goals of Documents Identified in Table 8-2 [a]
Objective AR-2.2: Improve surface water hydrology.	**Sub-Objective AR-2.2.1:** Enhance and/or restore natural hydrologic regimes. **Sub-Objective AR-2.2.2:** Reconnect severed aquatic systems and improve connectivity within aquatic systems. **Sub-Objective AR-2.2.3:** Reestablish drainage patterns of hydrologic regimes of riverine, lake, playa, freshwater pond, and freshwater forested/shrub wetland aquatic habitats.	• *SWAP* (CDFW 2015) • *DRECP Land Use Plan Amendment* (BLM 2016) • *Final Mojave Region Integrated Regional Water Management Plan* (Mojave Water Agency 2014)

Objective	Sub-Objective	Alignment with Goals of Documents Identified in Table 8-2 [a]
Goal AR-3: Support climate resiliency	See below	See below
Objective AR-3.1: Reduce impacts from climate change.	**Sub-Objective AR-3.1.1:** Enhance and/or restore aquatic resource function and value in areas of lower climate resilience to reduce climate change effects on aquatic resources—for example, energy dissipation or heat islands. **Sub-Objective AR-3.1.2:** Prioritize riparian areas of affected HUC-8s and implement improvements that involve enhancement and/or restoration to improve freshwater quantity and quality, floodplain connectivity, and in-stream cover continuity. **Sub-Objective AR-3.1.3:** Enhance and/or restore desert wash woodland and scrub, American southwest riparian forest and woodland, cienegas, and springs and spring brooks, by using native species such as Fremont's cottonwood (*Populus fremontii*), California fan palm (*Washingtonia filifera*), willow-like baccharis (*Baccharis salicina*), and iodine bush (*Allenrolfea occidentalis*) to reduce the effects of climate change. **Sub-Objective AR-3.1.4:** Reduce adverse in-stream flooding effects by restoring affected headwater and tributary hydrological functions for the Mojave River, Morongo Basin drainages (HUC-8 18100100), Little Horsethief Creek, El Mirage and Newberry Springs, and Orogrande (all in HUC-8 18090208). **Sub-Objective AR-3.1.5:** Prioritize enhancement and/or restoration in areas that can also reduce risk in flood prone systems, in particular areas along the Mojave and Amargosa Rivers.	• *SWAP* (CDFW 2015) • *Staff Report on Climate Change Mitigation and Adaption Strategy for the Lahontan Region* (Lahontan RWQCB 2019b) • *DRECP Land Use Plan Amendment* (BLM 2016)*Final Mojave Region Integrated Regional Water Management Plan* (Mojave Water Agency 2014)

Objective	Sub-Objective	Alignment with Goals of Documents Identified in Table 8-2 [a]
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 load of water, and maintain the flood conveyance properties of streams, such as rushes, bulrushes, willow-like baccharis and cattail. **Sub-Objective AR-3.2.2:** Prioritize management of invasive species in aquatic habitats, such as giant reed, tamarix, hydrilla, creeping water primrose, and halogeton, that may be exacerbated by climate change such that the greatest functional lift is provided. **Sub-Objective AR-3.2.3:** Enhance and/or restore small episodic streams that discharge into larger rivers such as the Mojave and Amargosa Rivers.	• *SWAP* (CDFW 2015) • *DRECP Land Use Plan Amendment* (BLM 2016) • *Staff Report on Climate Change Mitigation and Adaption Strategy for the Lahontan Region* (Lahontan RWQCB 2019b) • *Final Mojave Region Integrated Regional Water Management Plan* (Mojave Water Agency 2014)

Objective	Sub-Objective	Alignment with Goals of Documents Identified in Table 8-2 [a]
Goal AR-4: Provide multi-resource benefits	See below	See below
Objective AR-4.1: Coordinate mitigation to provide benefits to other resources.	**Sub-Objective AR-4.1.1:** Identify aquatic resource areas currently occupied by, or that provide habitat for, one or more special-status species, or areas that contribute to the protection of ecologically, geographically, and/or genetically distinct populations or sub-populations of obligate aquatic special-status species. **Sub-Objective AR-4.1.2:** Enhance and/or restore geographic, topographic, hydrologic, and soil features that support, riparian habitats, stream/wash habitats, and alkali sinks critical to species that use aquatic habitats in the GAI such as desert pupfish (*Cyprinodon macularius*), arroyo toad, southwestern willow flycatcher (*Empidonax traillii extimus*), California black rail (*Laterallus jamaicensis coturniculus*), western yellow bat (*Lasiurus xanthinus*), relict leopard frog, (*Rana onca*), and Arizona Bell's vireo (*Vireo bellii arizonae*). **Sub-Objective AR-4.1.3:** Increase shaded riverine aquatic habitat in the Mojave and Amargosa Rivers, Oro Grande, and Little Horsethief Creek for fish and other aquatic life.	• *SWAP* (CDFW 2015) • *Coachella Valley Multiple Species HCP/NCCP* (Dudek 2014) • *DRECP Land Use Plan Amendment* (BLM 2016) • *Lower Colorado River Multi-Species Conservation Program HCP* (Jones & Stokes 2004) • *San Bernardino County RCIS* (Dudek 2018) • *Draft Antelope Valley RCIS* (ICF 2019)

[a] More information on these plans is provided in Chapters 3 and 4.

8.8 Summary

Caltrans anticipates that future SHOPP and STIP-eligible transportation projects may be conditioned by the Corps, State Water Board, RWQCB, and CDFW to address the pressures and stressors that threaten aquatic resources in the GAI. The pressures and stressors include:

- Habitat loss, fragmentation, and degradation;
- Invasive species;
- Soil compaction, reduced water infiltration, soil erosion, and water quality degradation; and/or
- Climate change and drought.

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 Title 33 CFR Section 332.3, consolidating compensatory mitigation is 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 aquatic resource area, functions, and values in the GAI. The primary objectives associated with this goal are to provide functional lift and long-term protection of aquatic resources. The sub-objectives were selected to address the following pressures and stressors: habitat loss and habitat fragmentation.

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 and restore and enhance surface water hydrology. The sub-objectives were selected to address the following pressures and stressors: reduced water infiltration, soil compaction, soil erosion, and water quality degradation.

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: habitat loss, fragmentation, and degradation; invasive species; and climate change and drought.

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-3 describe what additional benefits exist for other resources in the GAI, including benefits to upland terrestrial habitat. Goal AR-3 was developed to include conservation for multiple resources while seeking to address 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 within the GAI.

9. ASSESSMENT OF AUTHORIZED ACTIVITIES

Informed by this RAMNA and its reviewers' comments and feedback, Caltrans District 8 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 a 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 objectives of (1) accelerating transportation project delivery and (2) protecting natural resources through transportation project mitigation. Understanding these objectives should assist 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; 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, project scopes will address transportation project delivery acceleration and natural resources protection. To meet the AMP's objective of accelerating transportation project delivery, at a minimum, 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 (Table 9-1). To meet the AMP's objective of natural resource protection through transportation project mitigation, at a minimum, an advance mitigation project scope will be consistent with resource and regulatory agency goals and objectives, which may be expressed in an approved regulatory instrument or interagency agreement and/or aligned with conservation goals and objectives identified in Chapter 7 or Chapter 8 and summarized in Table 9-2.

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

Advance mitigation project scopes must include the following:
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 at least one resource and regulatory agency's goals and objectives
Yield mitigation in units and terms approved by resource and 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 resource and regulatory agencies that attaches or binds advance mitigation requirements to a sponsor, qualified third party, or permittee; resource and 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 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 resource or 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 2017/2018 to 2026/2027 are presented in Chapter 5, and the timing of the needs is analyzed in Chapter 6. For the time interval under consideration, 2017/2018 to 2026/2027, District 8 intends to prioritize purchasing or developing mitigation credits or values that may benefit Senate Bill 1 transportation projects that are planned for the beginning and middle of the planning period. Hence, given the expected timing of mitigation need, at this time (July of fiscal year 2020/2021) mitigation that can be purchased or established by 2023/2024 (within the next 2 years) could address approximately:

- 250 acres of desert tortoise habitat mitigation need, potentially contributing to the acceleration of 10 of transportation projects.
- 0.7 acres of wetland mitigation need, potentially contributing to the acceleration of one transportation project.
- 2 acres of waters[1] of mitigation need, potentially contributing to the acceleration of 8 transportation projects.

All or some of these needs could form the basis for Caltrans District 8 to develop an advance mitigation project scope.

[1] "Waters" is a general term that can apply to WOTUS, waters of the state, or both. The SAMNA model does not distinguish between federal or state jurisdictions.

9.3 Authorized Activity Summary

Broadly speaking, the 11 SHC § 800.6(a) authorized activities can be divided into two groups: (1) purchasing compensatory mitigation that has been previously approved by the resource and regulatory agencies through a conservation/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. Advance mitigation project scope options that have a high probability of successfully meeting the AMP's objectives are feasible. Below, a brief description of each of the 11 SHC § 800.6(a)-authorized advance mitigation project types is provided, followed by a discussion of its feasibility. Listed in Table 9-3, some advance mitigation project types are not currently feasible because they are not available in the GAI. Others are not currently feasible because a regulatory and administrative pathway is not available. Still others may be not be feasible to implement on a schedule to contribute to accelerated transportation project delivery. Results of the feasibility analysis are summarized in the subsections below and in Table 9-4 (wildlife resources) and Table 9-5 (aquatic resources), both of which are located at the end of this chapter.

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

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

Advance Mitigation Project Type	Authorization	Section
Caltrans acquires, restores, manages, monitors, enhances, and preserves lands, waterways, aquatic resources, or fisheries, or funds the acquisition, restoration, management, monitoring, enhancement, and preservation 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[e] pursuant to SHC § 800.9. The programmatic mitigation plan shall include, to the maximum extent practicable, the information required for an RCIS.[c]	SHC § 800.6(a)(4) SHC § 800.9	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] 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)].

The feasibility of SHC § 800.6(a)-authorized advance mitigation project types that consist of purchasing compensatory mitigation that has been previously approved by the resource and regulatory agencies through an HCP/NCCP, conservation/mitigation bank, in-lieu fee program, or MCA is analyzed below.

9.3.1. NCCP and/or HCP Fees

NCCPs and HCPs were discussed in Section 4.1. NCCPs and HCPs are species-focused and are aligned with and plan for natural resource protection. NCCPs and HCPs provide for incidental take under CESA and ESA, respectively. CDFW is the signatory agency to NCCPs. FWS is the signatory agency to HCPs.

Caltrans identified five final or in-progress NCCPs and HCPs within the GAI, two of which had service area maps available (Table 4-1, Figure 4-1). Caltrans is only a permittee to one NCCP/HCP in the GAI, the Coachella Valley Multiple Species HCP/NCCP, which overlaps a small southern portion of the GAI (Figure 4-1). No transportation projects are planned for the portion of the Coachella Valley Multiple Species HCP/NCCP that overlaps the GAI.

Transportation projects are planned within the Apple Valley's Multi-species HCP/NCCP boundary (Figure 4-1); however, the Apple Valley Multi-species HCP/NCCP is still under development and mitigation is not yet available. In general, when Caltrans is not a permittee, it is unknown whether Caltrans would be able to contribute to an HCP/NCCP because Caltrans would need to apply as a Participating Special Entity to the plan's sponsor to qualify for some of the plan's privileges. It is also unknown whether the

HCPs/NCCPs where Caltrans might qualify as a Participating Special Entity are structured in such a way that Caltrans could purchase bulk credits or values in advance of transportation project delivery—that is, through advance mitigation project delivery. Through review of the RAMNA, Town of Apple Valley has reached out to Caltrans to discuss Caltrans mitigation needs and potential participation as a Participating Special Entity (Town of Apple Valley, pers. com. April 3, 2020).

Feasibility. 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,[2] at which point the credits or values would be available to transportation projects. Although no transportation projects are planned for the portion of the Coachella Valley Multiple Species HCP/NCCP, it can be noted that when Caltrans is a Permittee and the species and activities associated with SAMNA-related impacts are covered activities, such as for the Coachella Valley Multiple Species HCP/NCCP, fees or obligations can be paid by those transportation projects associated with the SAMNA impacts in accordance with the plan's terms. Hence, there may be no transportation project schedule benefit for paying fees early through an advance mitigation project. For NCCPs and HCPs where Caltrans would seek Participating Special Entity status, such as the Apple Valley Multi-Species HCP/NCCP (if approved), there may be schedule benefits if contributions were complete by 2021/2022 (Table 4-1; see Figure 6-3 for schedule). The District and a specific NCCP/HCP sponsor would need to determine the feasibility of this approach.

9.3.2. Conservation Bank Credit Purchase

Conservation banks were discussed in Section 4.2. 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 four conservation banks, three of which offer desert tortoise credits or will offer desert tortoise credits (Table 4-2; Figures 4-2 through 4-5). FWS is a signatory to two different banks, neither of which include desert tortoise credits (Table 4-2). CDFW and FWS are not cosignatories to any banks.

Conservation bank service areas are shown in Figures 4-2 through 4-5, and the anticipated transportation project impact forecast is presented by year in Figure 6-3. When placed side-by-side, it is possible to see that multiple transportation projects may need desert tortoise credits and which bank might have them available by 2021/2022, when the credits might contribute to transportation project acceleration.

Feasibility. 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 District will need to approach each bank to confirm the availability of credits and bulk credit purchase terms. Bulk credits purchased through an advance mitigation project might, with CDFW approval, be applied to meet future CDFW permit conditions on transportation projects.

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

For all banks, a BEI amendment would be required to formalize a process for bulk pre-permit credit purchases, and additional time for amending the bank should be considered. At this time (July of fiscal year 2020/2021), the Inter-Agency Project Delivery Team is in the process of developing new bank templates that incorporate pre-permit purchase terms, and these are anticipated to be available at the end of 2020. Since the desert tortoise is a dually listed species, it is probable that desert tortoise compensatory mitigation will be incorporated into future ESA biological assessments/opinions in coordination with FWS. An advance mitigation project specific agreement or instrument amendment would be required to formalize a process for bulk purchases at CDFW-only banks, in advance, that could be incorporated into future ESA biological assessments/opinions. The decision to amend a BEI is at the discretion of the bank sponsor.

9.3.3. Mitigation Bank Credit Purchase

Mitigation banks were discussed in Section 4.2. Mitigation banks are wetlands- and waters-focused, and each bank's alignment with natural resource protection is documented through its BEI. There is one mitigation bank, Petersen Ranch Mitigation Bank, in the GAI that provides CWA credits—the Corps, RWQCB, and CDFW are signatories (Table 4-2; Figure 4-5). A second one is pending. With respect to Peterson Ranch Mitigation Bank, it appears that the Corps' (CWA 404) credit service area does not include any areas within the GAI. Only CDFW and the Lahontan Regional Board have service areas inside the GAI.

Feasibility. After the Caltrans Director's approval for funding, delivering an advance mitigation project to purchase credits or fees is expected to take 1 to 3 years, at which point the credits or values would be available to transportation projects. The mitigation bank service area is shown in Figure 4-3, and the anticipated transportation project schedule is shown in Figure 6-3. When placed side-by-side, some transportation projects that need desert tortoise credits may also need waters or wetlands credits by 2021/2022, when the credits might contribute to transportation project acceleration. For all banks, a BEI amendment would be required to formalize a process for bulk pre-permit credit purchases, and additional time for amending the bank should be considered. At this time (July of fiscal year 2020/2021), the Inter-Agency Project Delivery Team is in the process of developing new bank templates that incorporate pre-permit purchase terms, and these are anticipated to be available at the end of 2020. The decision to amend a BEI is at the discretion of the bank sponsor.

9.3.4. In-lieu Fee Credit Purchase

In-lieu fee programs were discussed in Section 4.4. An in-lieu fee program conducts wetland, stream, or threatened or endangered species habitat restoration, creation, enhancement, or preservation activities.[3] Once enough money is received by the

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

program, it implements the project in that watershed. The in-lieu fee program's alignment with natural resource protection is documented through its enabling instrument.

Caltrans is aware of one in-lieu fee program that overlaps a small portion of the GAI, established through the Corps' process, the Coachella Valley Clean Water Act In-Lieu Fee Program.[4,5] The ILF Program is approved by the Corps and EPA, 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, the Rivers and Harbors Act. This program's service area is the same as the area covered by the Coachella Valley Multiple Species HCP/NCCP (Figure 4-1). However, no transportation projects are planned for the portion of the Coachella Valley Multiple Species HCP/NCCP that overlaps the GAI and, hence, there are no potential benefiting transportation projects.

Feasibility. 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. However, at this time (July of fiscal year 2020/2021), no in-lieu fee program credits are available for purchase that would meet the needs of the planned transportation projects.

9.3.5. MCA Credit Purchase

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. At this time (July of fiscal year 2020/2021), instructions and guidance for establishing MCAs are currently under development by CDFW.[6] In addition, although in progress, the required foundational RCISs underway in the GAI are not yet CDFW-approved. The two RCISs that overlap the GAI are discussed in Section 4.5.

Feasibility. At this time (July of fiscal year 2020/2021), 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[7] and FWS.[8] Conservation banks are species-focused, and each bank's alignment with natural resource protection will be documented through its BEI—a primary deliverable of an advance mitigation project. CDFW and FWS are potential signatories, and there also may be circumstances where the Corps and/or State Water Board would participate.

---

[4] www.cvmshcp.org
[5] http://cvmshcp.org/pdf%20files/Clean_Water_Act_In_Lieu_Fee.pdf
[6] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation
[7] https://wildlife.ca.gov/Conservation/Planning/Banking/Templates
[8] https://www.fws.gov/endangered/esa-library/pdf/Conservation_Banking_Guidance.pdf

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

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

An understanding of CDFW and FWS goals and objectives for wildlife resources in the GAI will improve the chances that credits established through an advance mitigation project will meet the compensatory mitigation needs of Caltrans' future transportation projects. In Chapter 7, Caltrans analyzed and synthesized the relevant and applicable information listed in Chapter 3 to develop its understanding of CDFW and FWS goals and objectives for the GAI. In brief, it is Caltrans' understanding that a conservation bank that addresses one or more of the following goals would be consistent with CDFW and FWS goals:

- Conserve and expand existing desert tortoise habitat (WILD-1).
- Preserve, enhance, and increase connectivity between blocks of desert tortoise habitat (WILD-2).
- Support resiliency of the landscape to climate change (WILD-3).
- Decrease desert tortoise mortality (WILD-4).
- Prioritize multi-species benefits (WILD-5).

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

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

9.3.7. Mitigation Bank Establishment

Instructions and guidance for establishing mitigation banks are available from the Corps[9] and CDFW.[10] At a minimum, mitigation bank establishment project scopes will refer to and rely on GAI information provided in:

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

- Chapter 2, *Environmental Setting*
- Chapter 7, *Wildlife Resources Conservation Goals and Objectives*
- Chapter 8, *Aquatic Resources Conservation Goals and Objectives*
- Appendix E, *Hydrologic Units*
- Appendix F, *Aquatic Resource Locations*

To support future transportation project permits, Caltrans would prioritize wetland and water 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 jurisdiction.

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, and CDFW are potential signatories. There also may be some circumstances where CDFW's participation in a bank would be documented through an MCA.

An understanding of Corps, RWQCB, FWS, and CDFW 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, Caltrans analyzed and synthesized the relevant and applicable information listed in Chapter 3 to develop its understanding of Corps, RWQCB, and CDFW goals and objectives for the GAI. In brief, it is Caltrans' understanding that a mitigation bank that addresses one or more of the following goals would be consistent with regulatory agency goals:

- Achieve no net loss of area, function, and value of aquatic resources, including WOTUS and waters of the state (AR-1). Note that preservation alone is not recognized by the Corps or RWQCB as providing no net loss.
- Restore and maintain the chemical, physical, and biological integrity of waters (AR-2)
- Support resiliency of aquatic resources to climate change (AR-3).
- Prioritize providing multi-resource benefits (AR-4).

Further, for each objective, Table 8-3 presented sub-objectives, which are intended to help guide Caltrans advance mitigation project scoping toward protecting natural resources through transportation project mitigation.

Feasibility. 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

At this time (July of fiscal year 2020/2021), a supportive regulatory and administrative pathway for CDFW to develop an in-lieu fee program has not been developed. With respect to Corps' jurisdictional resources, instructions and guidance for establishing an in-lieu fee program are available from the Corps.[11] FWS also follows federal guidance for establishing an in-lieu fee program.

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 8, *Aquatic Resources Conservation Goals and Objectives*
- Appendix E, *Hydrologic Units*
- Appendix F, *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 and RWQCB are potential signatories to the in-lieu fee program Enabling Instrument. Caltrans may also seek to establish credits that could be applied as compensatory mitigation to offset impacts as part of future ESA biological assessments/ opinions in coordination with FWS.

Feasibility. As pointed out above, instructions and guidance for establishing mitigation banks that yield 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 3 to 6 years: 2 to 3 years for set up, followed by 1 to 2 years to purchase credits (Section 9.3.4). Credits or values would be available to transportation projects according to the Interagency Review Team-approved in-lieu fee Enabling Instrument. Caltrans may contract or subcontract implementation tasks.

9.3.9. MCA Credit or Value Establishment

As 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 MCAs' alignment with natural resource protection will be documented through the foundational RCIS and the MCA itself—a deliverable of an advance mitigation project (CDFW 2018d). RCISs are also an SHC § 800.6(a)-authorized advance mitigation project deliverable.

At this time (July of fiscal year 2020/2021), instructions and guidance for establishing MCAs are currently under development by CDFW[12] and, although in progress, the

[11] https://www.spl.usace.army.mil/Missions/Regulatory/Mitigation/.
[12] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation

required foundational RCISs underway in the GAI are not yet CDFW-approved. The two RCISs that overlap the GAI are discussed in Section 4.5.

Caltrans envisions that credits or values 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 to apply to transportation projects.
- Caltrans funds performance of conservation actions and habitat enhancement actions as needed to generate mitigation credits pursuant to an MCA, where a third party is the MCA sponsor. The MCA sponsor, CDFW, and the 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 itself.

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[13] and CDFW would be the signatory. Caltrans may also request other agencies to be signatories to the MCA or seek project-specific interagency agreements with other 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 would be permittee responsible mitigation. Federal agencies prioritize credits purchased or established through banking and in-lieu fee programs over permittee responsible mitigation.

Feasibility. Without a supportive regulatory and administrative pathway for the resource and regulatory agencies to develop an MCA, the time needed to establish an MCA and its related credits or values is uncertain. However, once a CDFW-approved RCIS is in place, [14] and after the Caltrans Director's approval for funding, it is expected that delivering an advance mitigation project to establish an MCA and its credits or values would take 4 to 6 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[15] 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

[13] Caltrans is the Lead Agency under CEQA; CDFW's permitting authority does not include conditioning transportation projects under CEQA (Section 7).
[14] 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.
[15] https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation

include seeking signatures from agencies with overlapping jurisdictions into the scope and schedule.

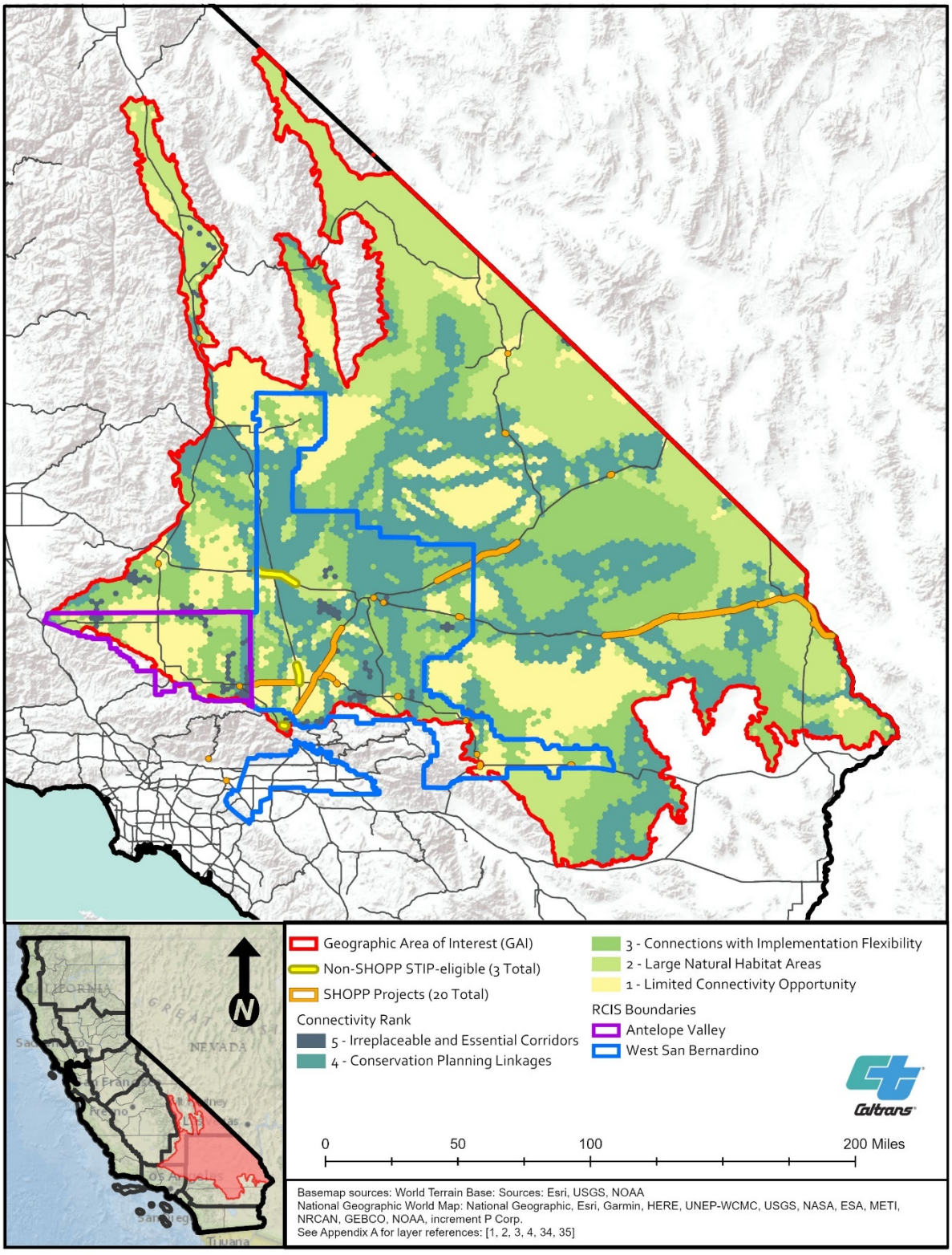
Wildlife Crossing and Aquatic Corridor Enhancements

One potential benefit of the RCIS and MCA process is that it may provide a mechanism for investments in increasing the permeability of the road system through wildlife crossings, fish passage improvements, and other aquatic corridor enhancements. Through an MCA developed under an RCIS, CDFW would be authorized to recognize credits established through wildlife crossing and aquatic corridor construction made separate from and distinct from specific transportation projects. An MCA for connectivity would be consistent with Caltrans' understanding of CDFW and USFWS' goal and objective to preserve, enhance, and increase connectivity between blocks of species of mitigation need habitat (WILD-2).

To support future transportation project permits, it would be necessary for a wildlife crossing or aquatic corridor improvement MCA funded through the AMA to establish CESA and/or Lake and Streambed Alteration Program credits. Through the MCA development process, CDFW would identify how the credits could be applied to meet transportation project permit conditions.

To further explore this potential, in Figure 9-1, Caltrans overlaid the CDFW ACE connectivity rankings presented in Figure 7-2 in relation to the GAI, the proposed Antelope Valley RCIS area, and the proposed San Bernardino County RCIS area. ACE connectivity rankings account for climate change resiliency. As illustrated, there may be opportunities to consider connectivity enhancements for MCAs for desert tortoise. Through the MCA development process, CDFW would identify how the credits could be applied to meet the transportation project permit conditions under its jurisdiction. There is also potential for the RWQCBs to identify how credits could be applied to meet the transportation project permit conditions under their jurisdiction. Where conditions would be suitable for CWA credits, there is potential for the Corps to consider aquatic corridor enhancement/restoration projects to be compensatory mitigation (Corps 2018). If Caltrans wanted to consider these for Corps mitigation, Caltrans would need to comply with the Corps mitigation regulations and guidance for permittee responsible mitigation.

Figure 9-1. RCISs and Connectivity Rankings



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 2020/2021), a supportive regulatory and administrative pathway for a resource agency to recognize credits or values established through this advance mitigation project type does not exist. Without an existing regulatory pathway, the time to establish credits or values for this advance mitigation project type is uncertain.

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.*

At this time (July of fiscal year 2020/2021), a supportive regulatory and administrative pathway for a resource agency to recognize credits or values established through this advance mitigation project type does not exist. These activities would, therefore, 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, in this case, 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 2020/2021), a number of the authorized activities listed in Table 9-3 appear to be feasible (Table 9-4; Table 9-5). This suggests that addressing 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 2018 through 2027 (Chapter 5) and evaluated its needs in light of when transportation projects

might need the mitigation (Chapter 6; Section 9.2, above). Based on its evaluation, Caltrans estimates it may be able to address approximately

- 250 acres of desert tortoise habitat mitigation need, potentially contributing to the acceleration of 10 of transportation projects.
- 0.7 acres of wetland mitigation need, potentially contributing to the acceleration of one transportation project.
- 2 acres of waters mitigation need, potentially contributing to the acceleration of 8 transportation projects.

Summarized in Table 9-4 and Table 9-5, Caltrans identified a number of options for how to meet its needs. The authorized activities consist of options to purchase existing mitigation credits (Sections 9.3.1 through 9.3.5) or establish additional mitigation (Section 9.3.6 through 9.6.11). At this time (July of fiscal year 2020/2021), a number of the authorized activities appear to be feasible and, under several scenarios, advance mitigation project scopes could cover multiple resources. For example, desert tortoise, Mojave ground squirrel and state waters/streams could be addressed within the same credit purchase or federally jurisdiction wetlands, waters of the state, and desert tortoise habitat could be addressed through the same credit establishment project.

Table 9-4. Wildlife Resources Credit Options and Feasibility, July 2020

Statement of Caltrans Need	Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Credits or values purchased or established by 2021/2022 could address approximately 250 acres of desert tortoise mitigation need, potentially contributing to the acceleration of 10 transportation projects.	NA	NA	NA	NA	NA
Authorized Activity Consists of Purchasing Credits or Paying Fees	See below	See below	See below	See below	See below
NA	Pay NCCP and/or HCP fees	Yes	No, transportation projects not planned for a covered area or the NCCP/HCP is in progress	NA	NA
NA	Purchase conservation bank credits	Yes	Yes, four CDFW approved banks in GAI with desert tortoise credits	Maybe, with FWS	1 to 3 years
NA	Purchase in-lieu fee credits	Yes, for FWS	No	NA	NA
NA	Purchase MCA credits	No (RCIS in progress)	NA	NA	NA

Statement of Caltrans Need	Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Authorized Activity Consists of Establishing Credits or Values	See below	See below	See below	See below	See below
—	Establish conservation bank	Yes	Yes, both CDFW and FWS	Yes	2 to 6 years
NA	Establish in-lieu fee program	Yes	Yes, with FWS	No	2 to 6 years
NA	Establish MCA credits or values[b]	No (RCIS in progress)	NA	NA	NA
NA	Establish RCIS and MCA[b]	RCIS – Yes (RCIS guidelines available) MCA – No (MCA guidelines in progress)	NA	NA	NA
NA	Establish mitigation that meets an RCIS objective	No	NA	NA	NA
NA	Establish mitigation in accordance with a programmatic mitigation plan	No	NA	NA	NA

Note: NA = not applicable
[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 2020

Statement of Caltrans Need	Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
Credits or values purchased or established by 2021/2022 could address approximately 2 acres of waters and 0.7 acre of wetlands mitigation need, potentially contributing to the acceleration of 10 transportation projects	NA	NA	NA	NA	NA
Authorized Activity Consists of Purchasing Credits or Paying Fees	See below	See below	See below	See below	See below
NA	Purchase mitigation bank credits	Yes	Yes, one Corps[c], State Water Board, and CDFW approved bank	Yes, RWQCB, Corps[c], CDFW, and FWS	1 to 3 years
NA	Purchase in-lieu fee credits	Yes, for FWS and Corps	No	NA	NA
NA	Purchase MCA credits	No (RCIS in progress)	NA	NA	NA
Authorized Activity Consists of Establishing Credits or Values	See below	See below	See below	See below	See below
NA	Establish mitigation bank	Yes	Yes, Corps, CDFW, and FWS	Yes, RWQCB, Corps, CDFW, and FWS	2 to 6 years
NA	Establish in-lieu fee program	Yes	Yes, for Corps and FWS	Maybe, RWQCB, Corps, and FWS	2 to 6 years

Statement of Caltrans Need	Authorized Activity	Regulatory and Administrative Pathway Available	Available/Opportunity Exists in the GAI	Potential to Address Overlapping Jurisdictions	Time to Complete[a]
NA	Establish MCA credits or values[b]	No (RCIS in progress; MCA guidelines in progress)	NA	NA	NA
NA	Establish RCIS and MCA[b]	RCIS – Yes (RCIS guidelines available) MCA – No (MCA guidelines in progress)	NA	NA	NA
NA	Establish mitigation that meets an RCIS objective	No	NA	NA	NA
NA	Establish mitigation in accordance with a programmatic mitigation plan	No	NA	NA	NA

Note: NA = not applicable
[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.
[c] Pre-purchase bulk credit purchases would likely be restricted to State Water Board and CDFW approved credits. Although the Corps is a signatory, the Corps' Peterson Ranch Mitigation service area is located outside of the GAI. Credits proposed to be purchased for transportation projects outside the bank service area would need to be pre-approved by the permitting agency; typically permitting agencies do not accept credits from projects outside of a bank's defined service area.

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 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, waters, and threatened or endangered species and/or their habitats, including riparian habitat.

Caltrans District 8 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 8 will also consider based on its localized knowledge of delivering mitigation in its region. As just one example, Caltrans may prioritize advance mitigation projects that reduce risk in implementation and long-term management by eliciting others to be bank or in-lieu fee sponsors.

As described in the introduction to this Chapter, as well as Section 9.1, to inform the advance mitigation project scope, Caltrans District 8 will use information within the RAMNA. Each scope will consider mitigation needs, the timing of mitigation needs, conservation data and plans, input from resource and regulatory agencies, interested parties and tribes, feasibility, timing, and other financial, strategic, and technical risks associated with transportation project delivery and conservation actions. Advance mitigation project scopes will also employ, as appropriate, existing applicable state and federal standards and instruments, mitigation-related agreements, advance mitigation project-specific agreements, and contracts with qualified third parties.

District 8 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 8 will commit to delivering the advance mitigation project within the scope, schedule, and budget communicated with nomination materials. At that point, Caltrans District 8 will initiate project delivery (see Steps 6 through 10 in Figure 1-2; Caltrans 2019a). Advance mitigation project delivery includes stakeholder engagement, project alternative analysis and further scoping, coordination with resource and regulatory agencies with the authority to approve compensatory mitigation, contracting with third parties and/or credit sponsors, and developing an agency-approved instrument and/or one or more advance mitigation project-specific interagency agreement. In addition:

- Stakeholder engagement will be conducted in accordance with each advance mitigation project's communication plan and be consistent with the applicable and appropriate requirements of existing applicable state and federal standards and instruments.

- Further scoping, when appropriate for the advance mitigation project type, will include site selection, when necessary. Site selection may be performed by Caltrans or under contract to Caltrans through a competitive bid process, and may include existing mitigation providers, for example, banks, NCCPs, MCAs, as well as 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 strive for consistency with appropriate conservation goals and objectives identified in Chapters 7 and 8.
- Further scoping, when appropriate for the advance mitigation project type, may be necessary to identify steps required to meet the goal of satisfying overlapping jurisdictional mitigation requirements.
- Instruments and advance-mitigation project-specific interagency agreement(s) 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.

10. REFERENCES

Abella, S. R., and K. H. Berry. 2016. “Enhancing and Restoring Habitat for the Desert Tortoise.” *Journal of Fish and Wildlife Management* 7(1): 255–279.

Bailey, R. 1995. *Description of the Ecoregions of the United States*. USDA Forest Service. Misc. Publication #1391.

Belnap, J. 2007. “Environmental Threats to the Great Basin.” Statement of Jayne Belnap, USGS and U.S. Department of the Interior. Hearing on the Major Environmental Threats to the Great Basin in the 21st Century. Accessed June 25, 2019. https://www.doi.gov/ocl/hearings/110/ThreatToTheGreatBasin_101107.

BLM (Bureau of Land Management). 2005. *Final Environmental Impact Report and Statement for the West Mojave Plan: A Habitat Conservation Plan and California Desert Conservation Area Plan Amendment*. Volume 1. BLM, County of San Bernardino, City of Barstow. California Desert District, Moreno Valley, California. January.

———. 2009. “Amargosa Wild and Scenic River.” Accessed February 19, 2019. https://www.blm.gov/programs/national-conservation-lands/california/amargosa-wsr.

———. 2014. *Bakersfield Resource Management Plan.* BLM, Bakersfield Field Office, Bakersfield, California.

———. 2015. *Desert Renewable Energy Conservation Plan Proposed Land Use Plan Amendment and Final Environmental Impact Statement*. BLM, in partnership with FWS, California Energy Commission, CDFW.

———. 2016. *Desert Renewable Energy Conservation Plan, Land Use Plan Amendment to the California Desert Conservation Plan, Bishop Resource Management Plan, and Bakersfield Resource Management Plan*.

———. 2019. *West Mojave Route Network Project Final California Desert Conservation Plan Amendment and Supplemental Environmental Impact Statement for the California Desert District*. April. Accessed July 31, 2020. https://eplanning.blm.gov/public_projects/nepa/93521/171245/208685/West_Mojave_Route_Network_Project_Land_Use_Plan_Amendment_Final_Supplemental_Environmental_Impact_Statement_508.pdf.

———. 2020. “Areas of Critical Environmental Concern.” Accessed August 3, 2020. https://www.blm.gov/programs/planning-and-nepa/planning-101/special-planning-designations/acec.

Boarman, W. I. 2002. “Threats to Desert Tortoise Populations: A Critical Review of the Literature.” U.S. Geological Survey, Western Ecological Research Center, Sacramento, California. Accessed February 5, 2020. https://www.fws.gov/nevada/desert_tortoise/documents/misc/tortoise_threats_boarman_usgs_2002.pdf.

Brooks, M. L., and D. A. Pyke. 2001. Invasive Plants and Fire in the Deserts of North America. In “Proceedings of the Invasive Plant Workshop: The Role of Fire in the Control and Spread of Invasive Species.” Edited by K. E. M. Galley and T. P. Wilson, 1–14. Tallahassee: Tall Timbers Research Station. Accessed February 5, 2020. https://www.firescience.gov/projects/00-1-2-04/project/00-1-2-04_00_1_2_04_Deliverable_04.pdf.

California Invasive Species Advisory Committee. 2010. “Invasive Species List and Scorecards for California.” Accessed February 27, 2019. http://ice.ucdavis.edu/invasives/home/species.

Cal-IPC (California Invasive Plant Council). 2019. “The Cal-IPC Inventory.” Accessed February 21, 2019. https://www.cal-ipc.org/plants/inventory/.

Caltrans (California Department of Transportation). 2015. “Standard Environmental Reference. Volume 1: Guidance for Compliance. Chapter 17 – Floodplains.” Accessed October 8, 2019. https://dot.ca.gov/programs/environmental-analysis/standard-environmental-reference-ser/volume-1-guidance-for-compliance/ch-17-floodplains.

———. 2017a. “Caltrans District 8 Geospatial Data for the Advance Mitigation Needs Assessment for the Second Quarter of FY 2017/2018” (data file). Accessed February 6, 2019. Available upon request from advancemitigation@dot.ca.gov.

———. 2017b. “Vegetation_D8 in Caltrans District 8 Geospatial Data for the Advance Mitigation Needs Assessment for the Second Quarter of FY 2017/2018” (data file). Accessed February 6, 2019. Available upon request from advancemitigation@dot.ca.gov.

———. 2017c. “Waters_D8 in Caltrans District 8 Geospatial Data for the Advance Mitigation Needs Assessment for the Second Quarter of FY 2017/2018” (data file). Accessed February 6, 2019. Available upon request from advancemitigation@dot.ca.gov.

———. 2017d. “Waters_with_Fish_D8 in Caltrans District 8 Geospatial Data for the Advance Mitigation Needs Assessment for the Second Quarter of FY 2017/2018” (data file). Accessed February 6, 2019. Available upon request from advancemitigation@dot.ca.gov.

———. 2017e. “Wetlands_D8 in Caltrans District 8 Geospatial Data for the Advance Mitigation Needs Assessment for the Second Quarter of FY 2017/2018” (data file). Accessed February 6, 2019. Available upon request from advancemitigation@dot.ca.gov.

———. 2018a. *State Highway Operation and Protection Program Ten-Year Project Book Fiscal Years 2017/18—2026/27*. State Highway Operation and Protection Program Fiscal Year 2017/18 (Quarter 4). Sacramento, California. July.

———. 2018b. *Advanced Mitigation Needs Assessment GIS Tool Report for California Department of Transportation*. Prepared by HDR. November.

———. 2019a. *Advance Mitigation Program Final Formal Guidelines.* Caltrans Headquarters Office of Strategic Biological Planning, Advance Mitigation and Innovation, Division of Environmental Analysis. Sacramento, California.

———. 2019b. *Statewide Advance Mitigation Needs Assessment Report*. State Highway Operation and Protection Program Ten-Year Project Book Second Quarter 2017/2018 Fiscal Year. Caltrans Headquarters Office of Strategic Biological Planning, Advance Mitigation and Innovation, Division of Environmental Analysis. May. Sacramento, California.

———. 2019c. “Climate Change Vulnerability Assessments. District 8 Technical Report.” Accessed March 1, 2020. https://dot.ca.gov/-/media/dot-media/programs/transportation-planning/documents/2019-climate-change-vulnerability-assessments/d8technicalreporta11y.pdf.

Caltrans (California Department of Transportation), CDFW, State Water Board, Corps (Los Angeles District, Sacramento District, and San Francisco District), EPA, FWS, National Marine Fisheries Service, and California State Coastal Commission. 2020. *Master Process Agreement for Planning and Developing Advance Mitigation Throughout California for the California Department of Transportation*. Signed January 24.

CDFW (California Department of Fish and Wildlife). 2015. *California State Wildlife Action Plan, 2015 Update: A Conservation Legacy for Californians*. Edited by Armand G. Gonzales and Junko Hoshi. Prepared with assistance from Ascent Environmental, Inc. Sacramento, California.

———. 2016. *California State Wildlife Action Plan: Transportation Planning Companion Plan*. Prepared by Blue Earth Consultants.

———. 2018a. “ACE Dataset Fact Sheet. Terrestrial Climate Change Resilience Factsheet.” Accessed February 19, 2019. https://map.dfg.ca.gov/metadata/ds2738.html.

———. 2018b. “California Essential Habitat Connectivity Project.” Accessed February 19, 2019. https://www.wildlife.ca.gov/conservation/planning/connectivity/CEHC.

———. 2019a. “RareFind 5 – California Natural Diversity Database Online Search.” Accessed November 2019. https://www.wildlife.ca.gov/Data/CNDDB/Maps-and-Data.

———. 2019b. *California Wildlife Habitat Relationships (CWHR) System*. Supported by the California Interagency Wildlife Task Group and maintained by CDFW. Database Version 9.0.

———. n.d. “NCCP Plan Summary – Town of Apple Valley Multi-Species Habitat Conservation Plan (MSHCP).” In preparation. Accessed June 10, 2019. https://www.wildlife.ca.gov/Conservation/Planning/NCCP/Plans/Apple-Valley-MSHCP.

———. 2020a. Comments on *RAMNA: Mojave Desert Section.* Personal communication from A. Amacher. Habitat Conservation Planning Branch, California Department of Fish and Wildlife. May 13.

———. 2020b. “A Petition to the State of California Fish and Game Commission Supporting Information for Aggassiz’s Desert Tortoise or Mojave Desert Tortoise.” March 11. Accessed August 3, 2020. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=178621&inline.

———. 2020c “California Wildlife Barriers 2020 Map (ds2867).” Accessed August 2, 2020. https://apps.wildlife.ca.gov/bios/?bookmark=327.

Center for Biological Diversity. 2019. “History of the California Desert Conservation Area.” Accessed December 4, 2019. https://www.biologicaldiversity.org/programs/public_lands/deserts/california_desert_conservation_area/history.html.

Cleland, D. T., P. E. Avers, W. H. McNab, M. E. Jensen, R. G. Bailey, T. King, and W. E. Russell. 1997. “National Hierarchical Framework of Ecological Units.” In *Ecosystem Management Applications for Sustainable Forest and Wildlife Resources*. Edited by M. S. Boyce and A. Haney, 181–200. New Haven: Yale University Press.

Cleland, D. T., J. A. Freeouf, J. E. Keys, G. J. Nowacki, C. A. Carpenter, and W. H. McNab. 2007. *Ecological Subregions: Sections and Subsections for the Conterminous United States*. Gen. Tech. Report WO-76D (Map on CD-ROM) (A. M. Sloan, cartographer). Washington, D.C.: USDA, Forest Service, presentation scale 1:3,500,000; colored.

CNRA (California Natural Resources Agency), CDFW, Corps, FWS, National Marine Fisheries Service, EPA, Natural Resources Conservation Service, and State Water Board. 2011. *Memorandum of Understanding Concerning Mitigation and Conservation Banking and In-Lieu Fee Programs in California*. September 22.

Coachella Valley Association of Governments. 2007. "Final Recirculated Coachella Valley Multiple Species HCP and NCCP." Accessed February 22, 2019. http://www.cvmshcp.org/Plan_Documents_old.htm#plan.

Colorado River RWQCB (Regional Water Quality Control Board). 2019. "Colorado River Basin Water Quality Control Plan. Chapter 3: Water Quality Objectives." Accessed February 22, 2019. https://www.waterboards.ca.gov/coloradoriver/water_issues/programs/basin_planning/.

Conservation Biology Institute. 2013. "California Desert Linkage Network." Accessed February 19, 2019. https://databasin.org/datasets/85d73316b5ab4816b56ed21787ed78a2.

Corps (U.S. Army Corps of Engineers). 2015. "Final Regional Compensatory Mitigation and Monitoring Guidelines for South Pacific Division USACE." Accessed February 19, 2019. https://www.spd.usace.army.mil/portals/13/docs/regulatory/mitigation/mitmon.pdf.

———. 2020. "Regulatory In-Lieu Fee and Bank Information Tracking System." Accessed February 19, 2019. https://ribits.ops.usace.army.mil/ords/f?p=107:2.

Cowardin, L. M., V. Carter, F. C. Golet, and E. T. LaRoe. 1979. *Classification of Wetlands and Deepwater Habitats of the United States*. FWS. FWS/OBS-79/31. Washington, D.C.

Desert and Mountain Conservation Authority. 2017. *Antelope Valley RCIS, Public Meeting, March 7, 2017*.

Desert Tortoise Preserve Committee. 2019. "Desert Tortoise Threats." Accessed February 21, 2019. http://tortoise-tracks.org/threats/invasive-plants.

Dudek. 2014. "Proposed Major Amendment to the Coachella Valley Multiple Species HCP and associated NCCP." Prepared for Coachella Valley Conservation Commission, U.S. Fish and Wildlife Service, California Department of Fish and Wildlife. March. Riverside, California. Accessed February 7, 2020. http://www.cvmshcp.org/Plan_Documents.htm.

———. 2018. *Draft San Bernardino County RCIS*. Prepared for San Bernardino County, San Bernardino Council of Governments, and Southern California Association of Governments. December.

EPA (U.S. Environmental Protection Agency). 2002. "National Wetlands Mitigation Action Plan." Accessed February 24, 2020. https://www.epa.gov/cwa-404/national-wetlands-mitigation-action-plan.

———. 2005. *National Management Measures to Control Nonpoint Source Pollution from Urban Areas*. EPA 841-B-05-004. U.S. Environmental Protection Agency, Washington, DC.

Federal Emergency Management Agency. 2019. "Flood Zones." Accessed October 8, 2019. https://www.fema.gov/flood-zones.

FWS (U.S. Fish and Wildlife Service). 1994. Endangered and Threatened Wildlife and Plants: Determination of Critical Habitat for the Mojave Population of the Desert Tortoise. 50 CFR Part 17. Vol. 59, No. 26, 5820–5866.

———. 2011. *Revised Recovery Plan for the Mojave Population of the Desert Tortoise (*Gopherus agassizii*)*. FWS, Pacific Southwest Region. Sacramento, California.

———. 2017. "National Wetlands Inventory. Wetlands Mapper." Accessed February 19, 2019. https://www.fws.gov/wetlands/data/mapper.html.

———. 2019. "Environmental Conservation Online System. Critical Habitat for Threatened & Endangered Species." Accessed February 19, 2019. https://fws.maps.arcgis.com/home/webmap/viewer.html?webmap=9d8de5e265ad4fe09893cf75b8dbfb77.

Griffith, G. E., J. M. Omernik, D. W. Smith, T. D. Cook, E. Tallyn, K. Moseley, and C. B. Johnson. 2016. "Ecoregions of California (poster)." USGS Open-File Report 2016-1021. Accessed October 2019. https://www.calflora.org/entry/help/epa-er4.html.

Hopkins, F. 2018. "California's Fourth Climate Change Assessment – Inland Deserts Region Summary Report." University of California, Riverside. Publication number: SUM-CCCA4-2018-008. August 27. Accessed February 7, 2020. http://www.climateassessment.ca.gov/.

ICF. 2019. "Public Draft Antelope Valley RCIS." October. (ICF 462.16.) San Diego, California. Prepared for Desert Mountains Conservation Authority, Lancaster, California. Accessed January 24, 2020. https://nrm.dfg.ca.gov/FileHandler.ashx?DocumentID=175455&inline.

Jones & Stokes. 2004. *Lower Colorado River Multi-Species Conservation Program, Volume II: HCP*.

Joshua Tree National Park. 2015. "Nonnative Species." Accessed February 21, 2019. https://www.nps.gov/jotr/learn/nature/nonnativespecies.htm.

Lahontan RWQCB (Regional Water Quality Control Board). 2016. "Water Quality Control Plan for the Lahontan Region: North and South Basins. Chapter 3: Water Quality Objectives." Accessed February 22, 2019. https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/docs/ch1_intro.pdf.

———. 2019a. “Draft Technical Staff Report/Environmental Document for Proposed Amendments to the Water Quality Control Plan for the Lahontan Region – Beneficial Use Changes for the Mojave River Watershed and Other Minor Revisions.” Accessed February 22, 2019. https://www.waterboards.ca.gov/lahontan/water_issues/programs/basin_plan/docs/mojave_river/drft_rpt_mjve.pdf.

———. 2019b. “Staff Report on Developing a Climate Change Mitigation and Adaptation Strategy for the Lahontan Region.” Accessed February 7, 2020. https://www.waterboards.ca.gov/lahontan/water_issues/programs/climate_change_adaptation/docs/report05.pdf.

Levick, L., J. Fonseca, D. Goodrich, M. Hernandez, D. Semmens, J. Stromberg, R. Leidy, M. Scianni, D. P. Guertin, M. Tluczek, and W. Kepner. 2008. *The Ecological and Hydrological Significance of Ephemeral and Intermittent Streams in the Arid and Semi-arid American Southwest*. U.S. Environmental Protection Agency and USDA/ARS Southwest Watershed Research Center.

Lovich, J. E., C. B. Yackulic, J. Freilich, M. Agha, M. Austin, K. P. Meyer, T. R. Arundel, J. Hansen, M. S. Vamstad, and S. A. Root. 2014. “Climatic Variation and Tortoise Survival: Has a Desert Species Met Its Match?” *Biological Conservation* 169: 214–224.

Mayer, Kenneth E., and William F. Laudenslayer, Jr., eds. 1988. “A Guide to Wildlife Habitats of California.” State of California, Resources Agency, Department of Fish and Game. Sacramento, California. Including revisions and updates. https://www.wildlife.ca.gov/Data/CWHR/Wildlife-Habitats.

McNab, W. H., D. T. Cleland, J. A. Freeouf, J. E. Keys, Jr., G. J. Nowacki, and C. A. Carpenter, comps. 2007. *Description of Ecological Subregions: Sections of the Conterminous United States* (CD-ROM). Gen. Tech. Report WO-76B. Washington, D.C.: USDA.

National Wild and Scenic Rivers System. 2019. “California.” Accessed February 19, 2019. https://www.rivers.gov/california.php.

NatureServe. 2018. “NatureServe Explorer: An Online Encyclopedia of Life.” Version 7.1. NatureServe, Arlington, Virginia. Accessed February 21, 2019. http://explorer.natureserve.org.

Omnibus Public Land Management Act of 2009. 2009. “Public Law 111–11—Mar. 30, 2009.” 123 Stat. 991. Accessed February 19, 2019. https://www.congress.gov/111/plaws/publ11/PLAW-111publ11.pdf.

Penrod, K., C. Cabañero, P. Beier, C. Luke, W. Spencer, E. Rubin, and C. Paulman. 2008. “A Linkage Design for the Joshua Tree-Twentynine Palms Connection.” South Coast Wildlands. Fair Oaks, California. Accessed February 10, 2020. http://www.scwildlands.org/reports/JT_TP_Connection.pdf.

Penrod, K., P. Beier, E. Garding, and C. Cabañero. 2012. "A Linkage Network for the California Deserts." Produced for the BLM and The Wildlands Conservancy. Produced by Science and Collaboration for Connected Wildlands, Fair Oaks, California, South Coast Wildlands, and Northern Arizona University, Flagstaff, Arizona. Accessed February 10, 2020. http://www.scwildlands.org/reports/ALinkageNetworkForTheCaliforniaDeserts.pdf

Randall, J. M., S. S. Parker, J. Moore, B. Cohen, L. Crane, B. Christian, D. Cameron, J. MacKenzie, K. Klausmeyer, and S. Morrison. 2010. *Mojave Desert Ecoregional Assessment.* Unpublished report. The Nature Conservancy, San Francisco, California.

Rollins-MacDonald, K., and S. Martinez. 2018. "Agenda Item 7 – Workshop on Countywide Habitat Conservation/Preservation Framework Study Update and Changes in State Legislative Direction." Memo to Local Agency Formation Commission for San Bernardino County from Executive Officer and Assistant Executive Officer. March 12. http://www.sbcounty.gov/uploads/LAFCO/AgendaNotices/20180321/Item_07.pdf.

San Francisco Estuary Institute. 2018. "California Aquatic Resource Inventory." Accessed February 28, 2019. https://www.sfei.org/cari#sthash.SnPvzyAU.dpbs.

Seager, R., M. Ting, I. Held, Y. Koshnir, J. Lu, G. Vecchi, H. Huang, N. Harnik, A. Leetmaa, N. Lau, C. Li, J. Velez, and N. Naik. 2007. "Model Projections of an Imminent Transition to a More Arid Climate in Southwestern North America." *Science* 316(5828): 1181–1184. May 25, 2007.

Spencer, W. D., P. Beier, K. Penrod, K. Winters, C. Paulman, H. Rustigian-Romsos, J. Strittholt, M. Parisi, and A. Pettler. 2010. *California Essential Habitat Connectivity Project: A Strategy for Conserving a Connected California*. Prepared for California Department of Transportation, California Department of Fish and Game, and Federal Highway Administration.

State Water Board (State Water Resources Control Board). 2018. "2014 and 2016 California Integrated Report." Clean Water Act Sections 303(d) and 305(b). Accessed July 20, 2019. https://www.waterboards.ca.gov/water_issues/programs/tmdl/integrated2014_2016.shtml.

———. 2019. "State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (for Inclusion in the Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California)." Accessed February 19, 2019. https://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/wrapp/20190222_clarifications.pdf.

Strategic Growth Council. n.d. *Mojave Regional Conservation Assessment*. In preparation.

Thorne, J. H., J. Bjorkman, R. M. Boynton, and P. R. Huber. 2015. *2015 Mitigation Needs Assessment for Transportation Projects for the Sacramento Valley Pilot Project for Regional Advance Mitigation Planning*. UC Davis.

Thorne, J. H., R. M. Boynton, A. J. Holguin, J. A. E. Stewart, and J. Bjorkman. 2016. *A Climate Change Vulnerability Assessment of California's Terrestrial Vegetation*. CDFW, Sacramento, California.

Town of Apple Valley. 2017. *Public Review Draft Town of Apple Valley NCCP Planning Agreement, Planning Agreement 2810-2017-001-06*. Planning Agreement by and Among the Town of Apple Valley, CDFW, and FWS Regarding the Town of Apple Valley Multi-Species HCP and NCCP. March.

———. 2020. Comments on the draft Mojave Desert Section Regional Advance Mitigation Needs Assessment. Personal communication from P. Fuentes, Solution Strategies, on behalf of the Apple Valley MSHCP/NCCP April 3.

USDA (U.S. Department of Agriculture) Natural Resources Conservation Service. 2003. "Introduced, Invasive, and Noxious Plants." Accessed February 27, 2019. https://plants.usda.gov/java/noxious?rptType=State&statefips=06.

USFS (U.S. Forest Service). 1994. "Ecological Subregions of the United States." Compiled by W. Henry McNab and Peter E. Avers. Last updated October 30, 1996. Accessed February 19, 2019. https://www.fs.fed.us/land/pubs/ecoregions/ch40.html.

USGS (U.S. Geological Survey). 2004. "Precipitation History of the Mojave Desert Region, 1893–2001." Fact Sheet 117-03. Accessed February 19, 2019. https://pubs.usgs.gov/fs/fs117-03/fs117-03.pdf.

———. 2013. "Federal Standards and Procedures for the National Watershed Boundary Dataset." Accessed January 7, 2020. https://pubs.usgs.gov/tm/11/a3/pdf/tm11-a3_4ed.pdf.

———. 2014. "National Hydrology Dataset & National Watershed Boundary Dataset." Accessed March 18, 2019. https://www.usgs.gov/core-science-systems/ngp/national-hydrography.

Weaver, R. H. 1974. "Feral Burros and Wildlife." Proceedings of the 6th Vertebrate Pest Conference. 49. Accessed June 25, 2019. http://digitalcommons.unl.edu/vpc6/49.

This page is intentionally left blank.