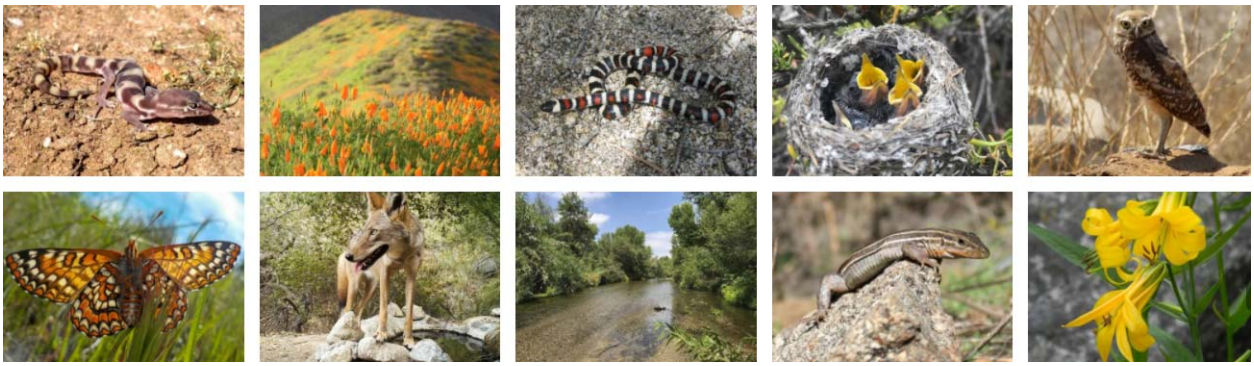
# Regional Advance Mitigation Planning to Support Connect SoCal in the SCAG Region

*Photo: San Bernardino County Transportation Agency*

*Photo: Lindsay P. Martin/TNC*

*Photo: Transportation Corridor Agencies*

*Photo: Orange County Transportation Authority*



*Photos: Western Riverside County Regional Conservation Authority*

FINAL DRAFT White Paper Prepared for Southern California Association of Governments

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# Acknowledgements

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# Executive Summary

The adopted regional plan, Connect SoCal, is a long-range plan that balances future mobility and housing needs with economic, environmental, and public health goals. Connect SoCal identifies over $638 billion in transportation system investments through 2045 in the six-county Southern California region, and recognizes the need for the housing, energy projects and water investments to support the region's communities and economy. At the same time, Southern California's natural environment hosts an extraordinarily rich and diverse array of ecosystems that provide habitat for plants and wildlife, many of which exist nowhere else on earth, and are essential to maintaining the fragile balance of nature and support resident's health and quality of life. The region's natural and working lands provide clean water and clean air, local fresh food, opportunities for healthy recreation, protection from climate threats like flooding, wildfire, and urban heat, and mitigate climate change by sequestering greenhouse gas emissions.

To achieve the balance envisioned in Connect SoCal, SCAG is working on new initiatives at the intersection of land use, transportation, and technology to achieve its goal of a more mobile, sustainable, and prosperous region, and to reach the region's greenhouse gas reduction goals. Regional Advance Mitigation Planning (RAMP) is one example of a strategy that sits at that intersection of land use, transportation, and technology, and supports Connect SoCal's goals. RAMP seeks to balance the need for infrastructure and conservation in the region to maximize benefits to the environment, economy, and communities. Given the synergistic outcomes from RAMP, especially the benefits to the environment, a RAMP planning initiative was included as component of a mitigation measure in the Connect SoCal Programmatic Environmental Impact report (EIR).

RAMP is a science-based integrated planning framework that, when implemented, expedites infrastructure project delivery, and achieves meaningful conservation outcomes. By identifying and aligning future development and conservation planning, RAMP saves time, money and staff resources, results in permit efficiencies, accelerates conservation investments, and encourages agency communication and coordination. RAMP allows infrastructure agencies to get ahead and stay ahead, by planning and securing anticipated compensatory mitigation needs well in advance of project development, getting projects done sooner and cheaper through streamlined regulatory review and permitting. Simultaneously, conservation benefits are achieved from pooling required mitigation funding to enable protection, restoration or enhancement of larger-scale and higher priority habitat than the typical project-by-project mitigation approach.

Guided by the data-rich integrated planning framework, RAMP can be implemented through Natural Communities Conservation Plan/ Habitat Conservation Plans (NCCP/NCCPs), Regional Conservation Investment Strategies (RCIS) and associated Mitigation Credit Agreements (MCAs), and mitigation and conservation banks. Southern California has been a leader in developing highly successful RAMP programs, mostly at the sub-county level that are well established and achieving their desired outcomes. However, there are gaps in RAMP coverage and coordination in and throughout the SCAG region, and there may be opportunities to provide region-wide RAMP resources and support that can assist existing programs, potentially new programs and inter-jurisdictional collaboration.

This white paper was commissioned by SCAG to investigate the question of advancing RAMP in the six-county region as a regional strategy and is guided by research, and information from transportation agencies, conservation organizations, and others. The paper provides background on RAMP and identifies the benefits and challenges of instituting RAMP in the region. This white paper does not come to a conclusion; rather it explores opportunities to support existing and future programs, RAMP initiatives that could cross jurisdictions to serve inter-regional infrastructure and conservation needs, science and planning resources, agencies' roles, questions and information gaps.

That said, the white paper suggests that SCAG is well positioned to support RAMP in the region, given its regional scope, existing partnerships and relationships, robust data and infrastructure planning expertise, and commitment to project delivery and conservation outcomes. SCAG has no intention to assume responsibility for RAMP in the region; a program, should it be established consistent with Connect SoCal's PEIR mitigation measures, would be voluntary, promote flexibility in options and actions, address clear needs, and add value to existing partners and programs. As SCAG, partners and collaborators explore more deeply the possibility of a RAMP initiative in the region, specific tasks can be pursued that can help inform decisions as the conversation continues. Those next steps are: 1) Identify the potential demand for advance mitigation through integrating conservation and impacts assessments, potentially focusing on specific sectors or geographies; 2) Evaluate regional network and collaborative opportunities to study options for the structure and stakeholder engagement for a RAMP initiative; 3) Consider opportunities to close gaps in RAMP plans and mechanisms to enable RAMP throughout the region; 4) Explore options for funding and financing a RAMP initiative in the SCAG region; and 5) Consider a pilot project based on emerging mitigation needs.

The white paper is organized around the following chapters:

*Regional Advance Mitigation Planning: an overview*
This chapter identifies the problems with project-by-project mitigation and describes the RAMP approach, its benefits and challenges. It highlights the existing advance mitigation programs in the Region, gaps in coverage and cross-jurisdictional considerations.

*RAMP Foundations and Tools*
This chapter describes the regulatory context and foundations for RAMP and identifies advance mitigation tools and plans that can act as implementation opportunities. It also describes the regional and local planning context and other important considerations (like climate resilience, climate mitigation and general plans) at the various jurisdictional scales.

*A Science-based Integrated Planning Framework*
This chapter outlines the stepwise planning process to integrate and align infrastructure and conservation planning information that is the basis for RAMP. It provides the science and methods that underpin the RAMP approach enabling certainty and acceptance. It includes the principles behind conservation planning, the methods and data needed for assessing potential project impacts, and the data, tools and outreach needed for identifying advance mitigation opportunities.

*Partners and Collaborators*

This chapter describes the range of partners and collaborators in the RAMP process, identifies potential engagement opportunities and structures, and reports on feedback from interviews with partners and collaborators.

*Scope, Scale and Models*
This chapter identifies and considers different approaches to a regional RAMP program, given the existing advance mitigation programs, plans and other opportunities. It considers the inter-jurisdictional issues such as linear infrastructure, wildlife connectivity corridors, large sensitive habitats, and regulatory agency preferences such as ecoregional and watershed scales.

*Funding and Financing*
This chapter describes the importance of funding and financing to implementing a RAMP program. The chapter describes funding models, sources of funding for mitigation, costing models and timing.

*Authorities, Potential Roles and Responsibilities*
This chapter clarifies existing authorities and identifies potential roles for SCAG in a regional RAMP initiative and identifies the array of expertise and partners in the SCAG region.

*Recommendations*
This chapter provides recommendations for SCAG to consider based on the research and information gathered through the process, proposes areas of focus and incremental next steps, identifies information gaps and potential tools, and considerations for collaboration and roles.

## Regional Advance Mitigation Planning: An Overview

As the SCAG region's population and economy continue to grow, new housing units, employment facilities, water, energy, and transportation infrastructure are needed to accommodate the nearly two million residents that are forecasted to call Southern California home by 2050[28]. With an over 10 million additional jobs forecast in the region by 2050[29], strategies that expedite transportation infrastructure delivery are critical to keep people and goods moving.

Framing this regional growth are the diverse natural and agricultural landscapes of Southern California. These invaluable assets ensure a robust economy, clean drinking water, improved air quality, and essential recreation activities for all of the region's residents. In addition to desert, mountain and coastal habitats, some of the highest concentrations of native plant and animal species on the planet are found within our region. Recognized as part of the California Floristic Province, Southern California is one of the planet's top twenty-five biodiversity hot spots.[30] Yet due to major stressors such as climate change, urbanization and fragmentation, California is experiencing rapid biodiversity loss, with the most imperiled biodiversity of any state in the contiguous United States.[31]

Given the sensitive natural habitats of the Southern California region, many essential development projects will have impacts on sensitive species and habitats that may result in degradation of existing habitats and species, and increased fragmentation further threatening the viability of habitats and species and may require environmental mitigation as prescribed in each project's environmental document to avoid, or minimize the potential impact; if there are unavoidable impacts to species, habitats or resources, the project proponent is required to compensate for any impacts that do occur. This avoid-minimize-compensate sequence is called the mitigation hierarchy.[32]

The mitigation hierarchy guides project proponents to address environmental impacts in a number of ways, as defined in Title 14, Section 15370 of the California Code of Regulations (commonly known as the "CEQA Guidelines"):

(a) Avoiding the impact altogether by not taking a certain action or parts of an action;
(b) Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
(c) Rectifying the impact by repairing, rehabilitating, or restoring the impacted environment;

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[28] *Connect SoCal 2024 Preliminary Regional and County Growth Projections* retrieved from https://scag.ca.gov/sites/main/files/file-attachments/rc020322fullpacket.pdf?1643342099
[29] Ibid
[30] Myers, N., R.A. Mittermeier, C.G. Mittermeier, G.A.B. da Fonseca, J. Kent. (2000). Biodiversity Hotspots for Conservation Priorities
[31] Hamilton, Healy, Regan L. Smyth, Bruce E. Young, Timothy G. Howard, Christopher Tracey, Sean Breyer, D. Richard Cameron, et al. 2022. "Increasing Taxonomic Diversity and Spatial Resolution Clarifies Opportunities for Protecting US Imperiled Species." *Ecological Applications* e2534. https://doi.org/10.1002/eap.2534
[32] See U.S. EPA website: https://www.epa.gov/cwa-404/types-mitigation-under-cwa-section-404-avoidance-minimization-and-compensatory-mitigation

(d) Reducing or eliminating the impact over time by preservation and maintenance operations during the life of the action; and
(e) Compensating for the impact by replacing or providing substitute resources or environment.

Compensatory mitigation measures may include purchasing, restoring or enhancing habitat for certain affected species or activities. Mitigation is often required under federal statutes such as the Clean Water Act, Endangered Species Act, Federal Wild and Scenic Rivers Act, as well as state requirements under the California Environmental Quality Act (CEQA), California Endangered Species Act, CA Fish and Game Code Sections 1600-1616 (Lake and Streambed Alteration Agreements), Porter-Cologne Water Quality Control Act, California Wild and Scenic Rivers Act, and the Habitat Restoration and Enhancement Act.

Mitigating environmental impacts can often be expensive and increase total project costs significantly. Alongside mitigation, uncertainty in timing can also contribute to significant project costs. For transportation investments broadly, "the permitting process under federal and state legislation constitutes a major component of the project development and delivery process for transportation projects. Over $3.3 billion is spent annually on compensatory mitigation under the Clean Water Act (CWA) and Endangered Species Act programs."[33]

Traditionally, environmental mitigation has been handled by lead agencies during the CEQA process on a project-by-project basis, "usually near the end of a project's environmental review…where permitting delays can occur when appropriate mitigation measures cannot be easily identified and agreed upon, and the cost of mitigation often increases between the time the project is planned and funded and the time mitigation land is acquired. As a result, infrastructure agencies end up paying top dollar to satisfy mitigation requirements."[34] The practice of identifying mitigation measures at the end of a project's environmental review often results in delays in project delivery and uncertainty in the development process. This is often due to the costs incurred to conduct biological studies after project plans have been created, especially in instances where impacts are discerned that were not foreseen and mitigation costs increase unexpectedly. Furthermore, the lack of early coordination with regulatory agencies to pro-actively incorporate conservation data and align mitigation with regional conservation priorities results in delays in securing accepted mitigation and small-scale ineffective mitigation.[35] A national study identified that nearly two thirds of departments of transportation (DOTs) surveyed had experienced delays from environmental issues, often of 12 months or more.[36]

[33] Overman, J. H., Storey, B., Kraus, E., Miller, K., Walewski, J., Elgart, Z., & Atkinson, S. (2014). Maximizing mitigation benefits-making a difference with strategic inter-resource agency planning: year one technical report (No. FHWA/TX-13/0-6762-1). Texas. Dept. of Transportation. Research and Technology Implementation Office.
[34] Ibid
[35] Ibid
[36] Ibid

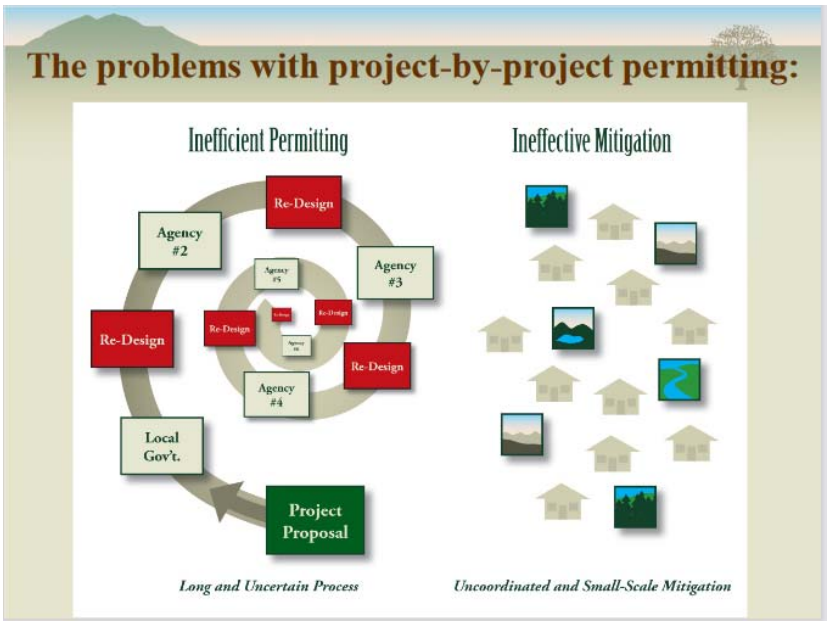


*Figure 1. Courtesy - ICF for East Contra Costa County Habitat Conservancy*

In California, researchers estimate that mitigation costs for transportation projects initiated between 2014 and 2019 ranged from two percent to twelve percent of total project costs – to a sum of roughly four billion dollars.[37] While the exact length and causes of delay from environmental review are varied, some reports suggest the current process may add 10 to 15 years to project delivery.[38] Continued cost escalations over the past two decades have prompted Caltrans to consider strategic planning for consolidated advance mitigation opportunities.

The delays, costs, and lack of effective conservation outcomes from traditional project-by-project mitigation has led to the growing trend of identifying mitigation needs and opportunities in advance of project development, known as advance mitigation planning, both in California and nationally.[39]

## Regional Advance Mitigation Planning (RAMP)

RAMP is a planning framework that represents an integrated and comprehensive approach to mitigating unavoidable biological resource impacts potentially caused by infrastructure or development projects. An alternative to project-by-project mitigation, RAMP aims to integrate regional-scale conservation into project proponents' efforts well in advance of detailed project-level planning. By focusing mitigation activities to areas that provide greater habitat and connectivity value, preserve highly functional

*RAMP is a science-based approach to identify and implement advance mitigation actions to support regional conservation priorities and expedite project delivery.*

[37] Sciara, G. C., Bjorkman, J., Stryjewski, E., & Thorne, J. H. (2017). Mitigating environmental impacts in advance: Evidence of cost and time savings for transportation projects. Transportation Research Part D: Transport and Environment, 50, 316-326.

[38] Sciara, G. C., Bjorkman, J., Lederman, J., Thorne, J. H., Schlotterbeck, M., & Wachs, M. (2015). Task 2 Report: Setting the Stage for Statewide Advance Mitigation in California.

[39] Metro Regional Advance Mitigation Needs and Feasibility Assessment, June 2018, prepared by ICF.

ecosystems, and reflect the conservation priorities of the region, RAMP seeks to better optimize mitigation spending and align mitigation projects with regulatory agency priorities.

RAMP incorporates both a regional geographical component and an advance time frame. The regional geographical component allows agencies to consider potential impacts of multiple planned development projects and the landscape and watershed health needs in the region. The advance time frame allows agencies to identify and implement regional mitigation opportunities that will satisfy anticipated mitigation requirements early in the project planning and the environmental review process, before projects are constructed, often years in advance.

RAMP aims to be faster, less expensive, and more effective than traditional project-by-project mitigation. The goal is for natural resource agencies and infrastructure agencies or project proponents to work together to integrate conservation data and estimate mitigation needs early in the projects' timelines for mutual benefit. For infrastructure agencies or developers, RAMP helps to potentially reduce potential mitigation needs and costs, avoid permitting and regulatory delays, and allow public mitigation dollars to stretch further.[40] For natural resource agencies and conservation organizations, RAMP requires a landscape-scale approach that better facilitates the early integration of mitigation considerations (such as avoidance and minimization) in project planning and design, that helps to ensure the durability and success of mitigation measures over time, transparency and consistency and facilitates investment in conservation priorities to create larger scale, connected and functional and resilient ecosystems. Further, RAMP catalyzes conservation actions such as protection, restoration or enhancement sooner, earlier in the development timeline, thereby avoiding conversion of valuable habitat to other uses.

RAMP itself is not a regulatory process and does not change CEQA in any way. By planning strategically on a larger scale and implementing mitigation in advance of project impacts or project delivery, RAMP allows both resource agencies and infrastructure agencies to work together to implement mitigation to be more cost effective, efficient, and successful.

## RAMP Foundations and Tools

RAMP is a planning framework that integrates infrastructure and development plans and projects with conservation information to satisfy regulatory requirements and to support regional planning and sustainability goals. It is an important strategy to advance Connect SoCal, a long-range plan that balances future mobility and housing needs with economic, environmental, and public health goals.

*"As a result of [the Western Riverside MSCHP], we are achieving key quality of life goals: protecting our environment and delivering needed transportation projects. The plan has proven that growth and conservation can co-exist."* Anne Mayer, Executive Director, Riverside County Transportation Commission.

[40] Sciara, G. C., Bjorkman, J., Stryjewski, E., & Thorne, J. H. (2017). Mitigating environmental impacts in advance: Evidence of cost and time savings for transportation projects. Transportation Research Part D: Transport and Environment, 50, 316-326.

It is well aligned with strategic mitigation tools that have been developed over the past thirty years, such as Natural Communities Conservation Plans (NCCPs). The Federal Highway Administration's Eco-Logical Approach and the Integrated Ecological Framework[41], programmatic mitigation plans in federal transportation and water infrastructure authorization laws and the U.S. Fish and Wildlife Service mitigation policies[42] encourage and authorize strategies to integrate conservation early into infrastructure development for better infrastructure and environmental outcomes. Agencies regulating wetlands and Waters of the U.S. emphasize the importance of a watershed approach[43] to mitigation. Both state and federal policies support the use of advance mitigation to fulfill state and federal compensatory mitigation requirements. More recently, the California Natural Resources Agency identified "Institutionalize Advance Mitigation" as one of nine strategic actions to achieve the state's goal of protecting 30 percent of California's lands and waters by 2030.[44]

## Applicable regulations

Development projects, whether advanced by public infrastructure agencies or private interests, are subject to federal, state, and local environmental regulations. As mentioned before, the RAMP process does not alter existing regulations. Since the RAMP process facilitates integrating conservation information with predicted impacts for future projects, the RAMP process aims to enable agencies to comply with the mitigation hierarchy more efficiently and mitigation requirements resulting from environmental regulations. The following is a list of the most relevant federal and state policies governing mitigation.[45]

### Federal Laws and Regulations

- National Environmental Policy Act (42 U.S.C. 4321 et seq.).
- Endangered Species Act of 1973 (16 U.S.C. 1531-1543).
- Clean Water Act (33 U.S.C. 1251-1543).
- U.S. Army Corps of Engineers (USACE)/US Environmental Protection Agency's (USEPA) 2008 Compensatory Mitigation for Losses of Aquatic Resources (Compensatory Mitigation Rule, USACE/USEPA 2008).
- Magnuson-Stevens Fishery Conservation and Management Act (U.S.C. Section 1801 et seq.).
- Coastal Zone Management Act (16 U.S.C. 1415, et seq.).

### State Laws and Regulations

- California Environmental Quality Act (P.R.C. 21000 et seq.).
- California Endangered Species Act (Fish and Game Code 2050 et seq.).

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[41] https://www.environment.fhwa.dot.gov/env_initiatives/eco-logical.aspx
[42] USFWS mitigation policy, filed at OMB
[43] https://www.epa.gov/sites/default/files/2015-07/documents/watershed_approach_handout.pdf
[44] https://www.californianature.ca.gov/pages/30x30 p. 4 in draft Pathways to 30x30 in California document
[45] Additional relevant statutes, regulations, policies, and guidelines are listed in the 2021 Statewide Advance Mitigation Initiative Memorandum of Understanding between Caltrans and regulatory agencies. https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/ser/2021-sami-mou-a11y.pdf

- California Natural Community Conservation Plan Act (Fish and Game Code Section 2800 et seq.).
- California Coastal Act, as amended (P.R.C., Division 20, 3000, et seq.).
- Other California Fish and Game Codes
  - Sections 1601-1603: Lake and Streambed Alteration Agreement.
  - Sections 3503, 3503.5, and 3511(a)(1). These sections prevent unlawful take, possession, or needless destruction of the nest egg of any bird, including birds of prey and fully protected birds.
  - Sections 4150 and 4700(a)(1). These sections prevent the take or possession of non-game mammals and fully protected mammals.
  - Sections 1850-1861: Regional Conservation Assessments, RCISs and Mitigation Credit Agreements.
  - Sections 1797-1799.1: Conservation Bank and Mitigation Bank Applications and Fees.
- State Water Resources Control Board: State Policy for Water Quality Control--State Wetland Definition and Procedures for Discharges of Dredged or Fill Material to Waters of the State (Procedures).

## Advance Mitigation Frameworks, Strategies and Plans

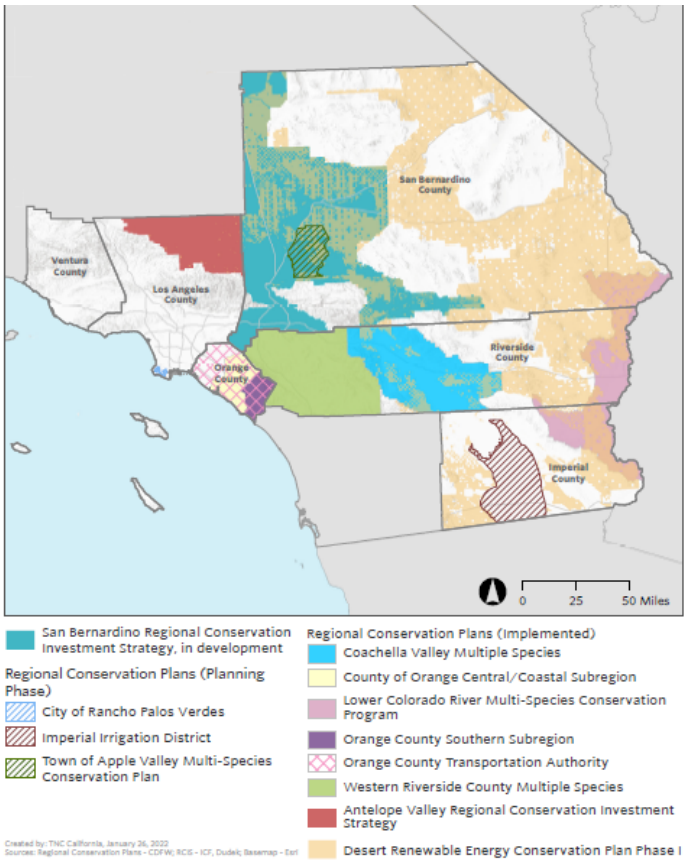
Advance mitigation planning is not a new idea. There are a host of frameworks, strategies and plans that enable advance mitigation through science-based integration of development and conservation data and planning strategies. The following strategies and plans are based on science, plan at a landscape scale and can be primary implementation mechanisms for RAMP mitigation actions.

### SPOTLIGHT RIVERSIDE COUNTY: HABITAT CONSERVATION PLANS/ADVANCE MITIGATION

Multi-species habitat conservation plans were launched in Southern California in the late 1990s/early 2000s to facilitate economic development and the conservation of threatened and endangered species and their habitats. Two of the first NCCPs/HCPs are in Riverside County: The Western Riverside MSHCP, administered by the Regional Conservation Authority (a subsidiary of the Riverside County Transportation Commission), and the Coachella Valley MSHCP, administered by the Coachella Valley Conservation Commission. Both plans were in response to the need to build housing, transportation, and other economic projects in an area that is a global biodiversity hotspot hosting species that are found nowhere else on Earth yet are in decline due to habitat fragmentation and loss. Today, the plans are in the implementation phase, protecting essential habitat while streamlining permitting for development projects. The Western Riverside MSHCP is the largest plan in the nation, protecting 146 native animals and plants and 33 endangered or threatened species, permanently conserving 500,000 acres of nature, while saving taxpayers more than $500 million and expediting environmental permits for freeway and road projects. The Coachella Valley MSCHP protects 240,000 acres of open space and 27 species and expedites permits for future road projects. Both plans offer certainty for infrastructure agencies and the business community. The conservation projects preserve native natural communities, habitat linkages and wildlife corridors, and create systems of open space parks, trails and reserves for residents and tourists to enjoy. The parks and reserves also support healthy recreation, clean air, clean water and climate resilience.

### *Habitat Conservation Plans/Natural Communities Conservation Plans*

Habitat Conservation Plans (HCPs), authorized under the federal Endangered Species Act, are designed to reduce conflicts between listed species and economic development by authorizing the limited and unintentional take of listed species and requiring conservation measures to minimize or mitigate the impacts at a regional scale.[46] Natural Communities Conservation Plans are authorized by California's Natural Community Conservation Planning Act are similar to HCPs in that they provide for the regional protection of plants, animals and their habitats while allowing compatible and appropriate economic activity.[47] The NCCP Act is broader in its orientation and objectives than the California and federal Endangered Species Acts, as NCCPs take a broad-based ecosystem approach to planning for the protection and perpetuation of biological diversity for a suite of species, requiring that conservation actions contribute to the recovery of the covered species.




*Regional Conservation Plans in the SCAG Region*

In Southern California, there are four highly successful multispecies habitat conservation plans, combined NCCP/HCPs that provide long-term coverage for federal and state covered species, involving both federal and state wildlife agencies, and streamlining environmental permitting for transportation and other projects.

- Orange County (Central/Coastal) NCCP/HCP (1996)[48]
- Western Riverside Multiple Species Habitat Conservation Plan (2004)[49]
- Coachella Valley Multiple Species Habitat Conservation Plan (2008)[50]
- Orange County Transportation Authority NCCP/HCP (2017)[51]

NCCP/HCPs typically have plan boundaries that are county subregions, designed to cover areas of high biodiversity, threatened and endangered species and habitats, where anticipated infrastructure and development projects may have environmental conflicts. While NCCP/HCPs can take many years to

[46] https://www.fws.gov/service/habitat-conservation-plans
[47] https://wildlife.ca.gov/Conservation/Planning/NCCP
[48] https://occonservation.org/about-ncc/
[49] https://www.wrc-rca.org/
[50] https://cvmshcp.org/
[51] https://www.octa.net/About-OC-Go/OC-Go-Environmental-Programs/Environmental-Mitigation-Program/

develop and receive approval, once approved, the plans enable a turnkey permitting approval process and a funding structure that supports robust investments to implement science-based conservation reserve designs approved by wildlife agencies. Some NCCP/HCPs have agreements with agencies regulating wetlands and waters, allowing coverage for multiple resources and permits, a significant benefit for project proponents.

### *Regional Conservation Investment Strategies*

Established by Assembly Bill 2087, a Regional Conservation Investment Strategy (RCIS) is a voluntary, non-regulatory regional planning process intended to result in higher-quality conservation outcomes and includes an advance mitigation tool, called Mitigation Credit Agreement (MCA). RCISs use a science-based approach to identify conservation and enhancement opportunities that, if implemented, will help California's declining and vulnerable species by protecting, creating, restoring and reconnecting habitat, and may contribute to species recovery and adaptation to climate change and resiliency. Any public agency can develop an RCIS and once approved, any entity can develop an MCA within the boundary of the RCIS to create advance mitigation credits by implementing the conservation or habitat enhancement actions identified in an RCIS. The credits may be used as compensatory mitigation for impacts under CEQA, CESA and the Lake and Streambed Alteration Program.[52] If other applicable natural resource agencies determine that an MCA meets relevant state or federal requirements under the federal ESA, the Clean Water Act, the Porter Cologne Act or other applicable regulations and policies, those agencies could elect to allow the MCA to create mitigation credits that can be used under those laws, regulations, and policies.

RCISs and associated MCAs differ from NCCP/HCPs in a number of ways; most significantly that MCAs are limited to generating advance mitigation investments for future use, helping to expedite project delivery. Project proponents must secure permits through the normal regulatory process.

### SPOTLIGHT OCTA: M2 AND THE MITIGATION PROGRAM

In 2006, Orange County residents passed Measure M2 to extend the county's half-cent sales tax for transportation projects until 2041. The conservation community, OCTA and Caltrans collaborated to include an advance mitigation component, modeled after SANDAG's TransNet and Riverside County's Renewed Measure A. M2 pools impacts of the freeway improvement projects in the plan and allocates $243.5 million (5 % of the cost of the projects) for larger scale mitigation with a focus on habitat protection, connectivity and resource preservation in exchange for streamlined project approvals. A greenprint developed by the Green Vision Coalition helped identify priority conservation lands to protect or restore. An Environmental Oversight Committee (EOC) oversees the Environmental Mitigation Program. In 2016, OCTA completed its NCCP/HCP for the mitigation lands. To date, OCTA has acquired 1,300 acres of open space lands, and restored about 350 acres of land. OCTA staff cite cost savings, strategic and meaningful conservation investments, wildlife agencies' expedited review of freeway projects, streamlined review of clean water act permits, productive partnerships and a legacy access program as key benefits of the program.

[52] Text adapted from CDFW's RCIS webpage: https://wildlife.ca.gov/Conservation/Planning/Regional-Conservation

In the SCAG region, the Antelope Valley RCIS is approved, and the San Bernardino County RCIS is in development, sponsored by the San Bernardino County Transportation Authority.

### *Mitigation and Conservation Banks*

Mitigation or conservation banks are privately- or publicly owned lands managed for natural resource values. In exchange for permanently protecting and managing the land, the bank operator can sell habitat, species, or aquatic resource credits to project proponents who need to satisfy legal requirements for compensating environmental impacts of projects.

A conservation bank generally protects threatened and endangered species and/or habitat. Credits are established for the specific sensitive species or habitat that occurs on the site. Agencies that typically participate in the regulation and approval of conservation banks are CDFW, USFWS and NMFS.

Mitigation banking relies on the same concept as conservation banking, but it includes aquatic resource creation, restoration, and enhancement undertaken to compensate for unavoidable impacts to aquatic resources. Mitigation banks are generally approved by the wildlife agencies, USACE, EPA, and regional water quality control boards using a coordinated review process through the Interagency Review Team. Where approved conservation banks or mitigation banks are available and have appropriate mitigation credits, project proponents or entities may purchase the credits. Where approved conservation banks or mitigation banks are not available, a RAMP program or any entity may establish or fund the establishment of one or more such banks.

### *Programmatic Mitigation Plans*

Programmatic mitigation plans are authorized in federal transportation[53] and water resources development[54] statutes to address the potential impacts of transportation and water resources development projects to ecological resources, habitat, fish, and wildlife. A programmatic mitigation plan includes an assessment of the conditions of environmental resources in the plan area and potential opportunities to improve the overall quality of the resources through strategic mitigation for impacts of infrastructure projects and can be used to help identify opportunities for advance mitigation.

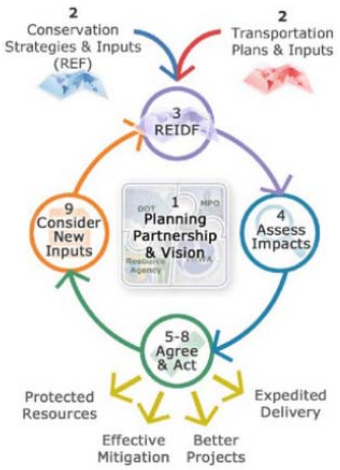
[53] 23 U.S.C. Sec. 169 (a) (SHC 800.9)
[54] 33 U.S.C. Sec. 2283 (h)

### *In Lieu Fee Programs*

In-Lieu Fee programs, described in the U.S. Army Corps of Engineers/U.S. EPA 2008 mitigation rule, involve the restoration, establishment, enhancement and/or preservation of aquatic resources through funds paid to a governmental or non-profit natural resources management entity to satisfy compensatory mitigation requirements for Clean Water Act 404 permits. The U.S. Army Corps of Engineers' Los Angeles District[55] approves in-lieu fees for the district.

## A Science-Based Integrated Planning Framework

RAMP integrates planned infrastructure or development projects and conservation planning to identify potential advance mitigation actions and sites that meet the regulatory requirements and achieve co-benefits. RAMP relies on science and methods to identify important conservation data and support the ecological health of landscapes and watersheds, and to determine estimated impacts of proposed transportation, water and energy infrastructure and other development projects. Conservation planning techniques are used to identify conservation values and direct advance mitigation investments to meet regulatory and broader conservation objectives that regulatory agencies support. Existing conservation plans developed locally can also help to direct mitigation investments to support implementation of those plans. Infrastructure assessments rely on the conservation planning to identify predicted impacts on sensitive species and habitats that help guide future mitigation assessments. Once integrated, further modeling and outreach can determine viable opportunities for advance mitigation that meet the regulatory requirements and generate support for projects that advance landscape scale and watershed health.




*FHWA Integrated Ecological Framework*

### RAMP Planning Steps

The RAMP process can be simplified into six steps as follows. For illustrative purposes, we use transportation as a model, but the framework can apply to other infrastructure such as water, energy projects, housing plans and projects. The methodology, first developed and published by UC Davis[56] has informed the methodology that Caltrans is currently using for the Advance Mitigation Program.[57] The stepwise process outlined here is intended to be done in coordination with the regulatory agencies to ensure the data, methods and outcomes for the conservation assessment and impacts assessment reflect their input and priorities.

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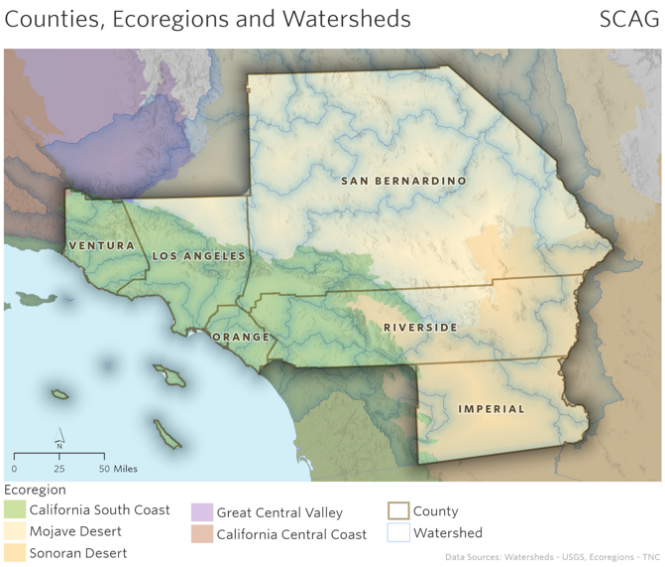
[55] https://www.spl.usace.army.mil/Missions/Regulatory/Mitigation.aspx

[56] Thorne, James H; Bjorkman, Jacquelyn; & Huber, Patrick R. (2015). A Reference Manual for Caltrans Staff on Regional Advance Mitigation Impact Assessment Methods. UC Davis: Information Center for the Environment. Retrieved from: http://escholarship.org/uc/item/76n8793q

[57] See Caltrans Statewide Advance Mitigation Needs Assessment report methods, retrieved from https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/2020-q2-samna-report.pdf

Determine the scope of the region for the analysis. A critical feature of RAMP is the regional scope, allowing integrated analyses that helps identify and consider multiple infrastructure projects for advance mitigation, and incorporates the ecological health of ecoregions and watersheds to foster connected, diverse, and resilient lands and waters, and the benefits they provide to communities. The scale of a region can be ecological, such as ecoregions or watersheds, or jurisdictional, such as a sub-county, county or multiple counties. Regulatory agencies emphasize the importance of planning at ecoregional, sub-ecoregional and/or watershed scales to incorporate broader conservation goals such as habitat and aquatic connectivity and climate resilience, and for ease of identifying suitable mitigation sites.[58] Caltrans is developing the Regional Advance Mitigation Needs Assessments at ecoregional scales.

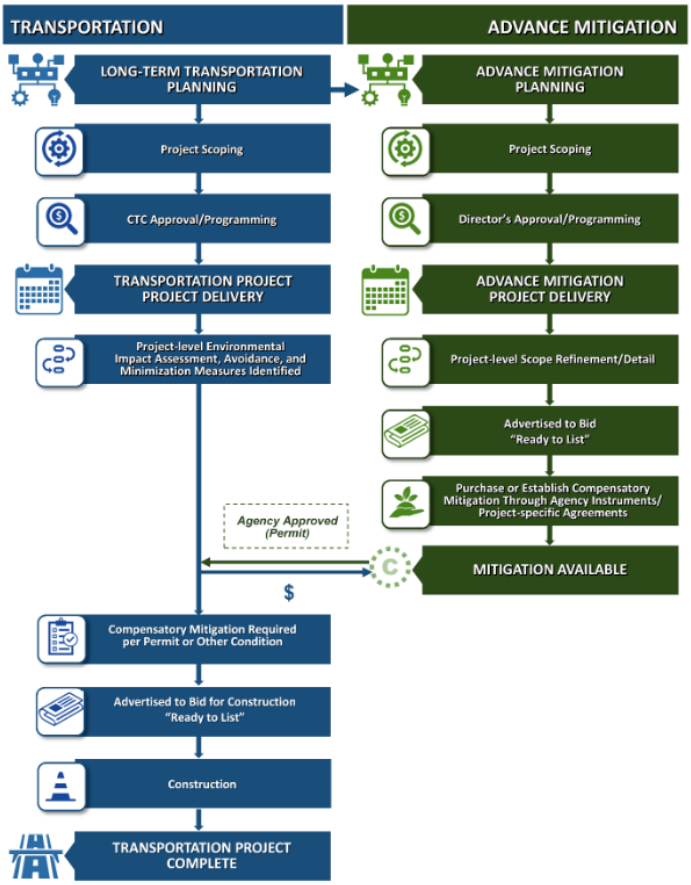



Assemble conservation information in the region. Assembling conservation information in the selected region into a conservation assessment will provide a picture of the ecological health of the region, stressors and opportunities for investment in advance mitigation strategies that support regional conservation goals. The conservation assessment serves two main purposes: it helps project proponents understand the existing environmental conditions and future conservation goals to develop projects' plans to avoid or minimize impacts, thereby reducing the need for compensatory mitigation, and it provides a foundation on which to estimate future projects' impacts. The information assembled typically includes information on:

- Federal and/or state listed species and special-status species
- Habitat connectivity corridors and landscape permeability
- Ecologically sensitive natural communities, including as waters and wetlands
- Existing conservation plans
- Co – benefit information such as carbon sequestration, climate resilience, water, recreational access, environmental justice

[58] Ibid.

Identify planned infrastructure and/or development projects in a region. Potential infrastructure or development projects to be considered for RAMP include those that are planned sufficiently far enough in the future to be able to take advantage of *advance* mitigation (see chart to the right to see the timing of advance mitigation with transportation project delivery); and could possibly require mitigation measures. For example, projects in a Regional Transportation Plan that add transit capacity on existing infrastructure or planning projects would not be included as they would not likely have habitat impacts. The projects need to be digitized in order to run the analysis. For selected projects a footprint is estimated by applying buffers using existing models.




*Timing of Advance Mitigation Process. Credit: Caltrans*

Estimate potential impacts and mitigation need. The next step is to integrate the conservation information and the list of infrastructure projects to estimate potential impacts of planned projects on covered species and sensitive habitats. This is done by overlaying project footprints on species and habitat models and identifying a range of impacts to account for estimates in the model, resulting in a range of high to low potential impacts. Once the range of impacts is identified for the relevant species and habitats, one can then apply a mitigation ratio to identify potential mitigation need. For example, if the analysis finds that the projects collectively may impact 20 acres of a species' habitat, applying a mitigation ratio of 2:1 for mitigation would result in a mitigation need of 40 acres of that habitat. Importantly, this information is for planning purposes only to give order-of-magnitude mitigation estimates and not for expected permitting actions.

Collaborate and identify existing options or suitable mitigation sites. Once the estimated mitigation need for species and habitats is known, there are a number of ways that one can identify and consider strategic mitigation options that support the advance mitigation needs and conservation goals. These include mitigation strategies, mitigation mechanisms, mitigation sites and specific mitigation actions that meet conservation priorities and provide project proponents the more efficient project delivery outcomes. RAMP prioritizes opting-in with existing strategic advance mitigation programs that contribute to ecosystem-level and regional conservation goals such as existing NCCP/HCPs, conservation and mitigation banks, in-lieu fee programs and Mitigation Credit Agreements.

If no such strategic advance mitigation plans or mechanisms exist, mitigation credits can be created by working with partners to protect, restore or enhance habitat that meet the predicted compensatory mitigation needs for a suite of future projects. Outreach is critical to identify potential partners who could act as suppliers of mitigation, such as mitigation bankers, land trusts, conservancies, habitat agencies, open space districts and local governments. Further analysis may be helpful to identify a portfolio of potential advance mitigation sites using techniques such as Marxan[59] reserve selection software to evaluate areas for potential biological suitability. See chart below for an illustration of the mitigation decision tree.

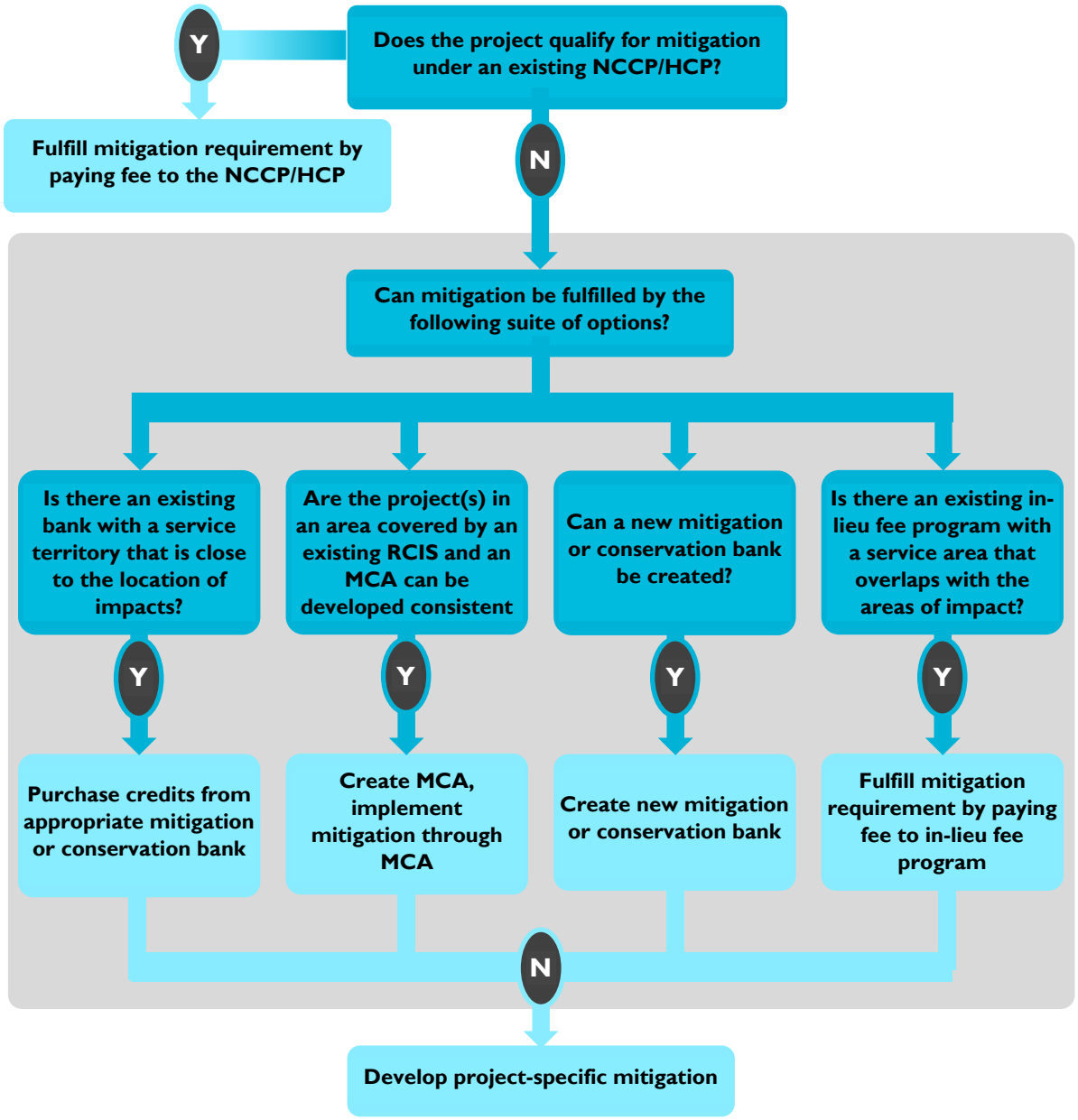
Implementation: Secure or generate mitigation credits for use in the future.

As mentioned, if a strategic advance mitigation option exists that enables project proponents to secure mitigation credits immediately, that is likely to be the most efficient option. Participating in an NCCP/HCP, purchasing credits from a bank, or purchasing/using available credits from an MCA will satisfy compensatory mitigation needs.

If no such option exists, project proponents can invest in advance mitigation actions consistent with regional conservation goals by using an approved RCIS to site mitigation actions in high priority conservation areas, thereby creating an MCA for a suite of advance mitigation actions, create mitigation or conservation banks, through mechanisms like a request for proposal.

To be considered RAMP investments, implementation strategies and mechanisms must be forms of advance mitigation, contribute to regional conservation priorities, implemented with the concurrence of applicable natural resource agencies, and will create mitigation credits or values before infrastructure or project impacts occur. In many cases, RAMP mitigation actions can be implemented by providing funding and support to appropriate partners, entering into agreements with the partners regarding how a mitigation action will be implemented, and enabling the partner to implement the mitigation. For example, RAMP managers or project proponents could issue “requests for proposals” that invite partner organizations and entities to submit proposals for habitat or aquatic resource conservation actions for future predicted mitigation needs that align with RAMP goals. RAMP managers or project proponents could create mitigation values or mitigation credits by contributing funding and support for large-scale conservation actions implemented by RAMP partners, including but not limited to habitat protection or wetland restoration actions, creating mitigation values or mitigation credits from only a portion or phase of the larger conservation action. This approach can both increase the efficiency of RAMP implementation and increase the ecological success of the large-scale conservation action and the RAMP mitigation action.

[59] https://marxansolutions.org/




*Mitigation Prioritization Decision Tree. Credit: East Bay RAMP Sub-Regional Assessment*

## Science and Methods

The following outlines the methods for developing conservation assessments and estimating potential impacts of infrastructure projects, focusing on transportation given that there are established methods in current use. The basic approach for identifying estimated impacts is the intersection of modeled infrastructure project footprints and natural resource spatial layers, with co-benefit information providing information on impacts to and benefits of potential RAMP investments to help with prioritization.

## Conservation Assessments

Science-based conservation assessments include data and analysis that describes and maps the distribution of conservation values and co-benefits across a region. Once developed, a conservation assessment can provide an objective, science-based process, and suite of data on which to estimate future development projects' impacts and to provide a tool to assist RAMP stakeholders in prioritizing lands for restoration, protection and enhancement for advance mitigation purposes. Models exist for conservation assessments, such as conservation reserve designs in NCCP/HCPs, Caltrans' Regional Advance Mitigation Needs Assessments[60], the Conservation Assessment of Orange County[61] created to support OCTA's M2 Environmental Mitigation Program, and Biodiversity in Los Angeles (BAILA)[62].

Incorporated in conservation assessments are essential strategies to protect biodiversity. These strategies can guide development of conservation assessments and help identify priority mitigation actions. As described in the *Draft Pathways to 30x30 in California* report, those strategies include:

- Protect areas that are adjacent or linked to existing conserved areas to support large, interconnected landscapes and seascapes
- Ensure conservation of habitats that represent the full diversity of California's ecosystems, especially rare or remnant habitat types
- Restore degraded habitats, especially for rare ecosystems
- Target areas with high species richness, endemism (species only found in one place), and species rarity
- Prioritize places that support exceptional biocultural significance, which account for the interconnected nature of people and places.

### MITIGATION WIZARD

RAMP is a science-based process that relies on conservation and infrastructure data, models and approaches that align with regulatory agency policies and priorities. The methods require capacity, expertise and tools to conduct the analysis and process to determine mitigation demand, supply, opportunities and co-benefits. The Mitigation Wizard is a new, freely accessible tool embedded in the Bay Area Greenprint that was developed to enable RAMP opportunities in the San Francisco Bay Area. With regulatory and transportation agencies as advisors, the Mitigation Wizard is a web-based decision support tool that helps users identify the potential impacts of their projects on special-status species and sensitive habitats, and then evaluate potential conservation or restoration project areas to offset them. Users can then run the areas through the Bay Area Greenprint to understand projects' areas co-benefits, helping to make mitigation investments that support multiple benefits.

OCTA's M2 Environmental Mitigation Program developed criteria to guide acquisition, restoration and management of mitigation properties[63]. The criteria include information for biological assessments,

[60] https://dot.ca.gov/programs/environmental-analysis/biology/advancemitigation
[61] http://www.octa.net/pdf/CBIReport_final.pdf (2009)
[62] https://www.scienceforconservation.org/assets/downloads/BAILAreport_FINAL.pdf
[63] https://www.fhbp.org/PDFs/Resources/Resources/M2/OCTA-M2-Evaluation-Criteria.pdf

information to ensure alignment with land use and support from local governments, communities and regulatory agencies, information to help leverage co-benefits, and potential constraints.

At a basic level, data is assembled that represents biodiversity in the region, the conservation goals and objectives and existing conservation plans. Those data include: habitat, threatened and endangered species, special-status species, natural communities, habitat connectivity and climate resilience. Regulatory agencies should be consulted when identifying data for a conservation assessment to ensure the assessment incorporates the agencies' relevant data, policies and priorities. Examples of data to support RAMP conservation assessments include:

*Biodiversity, habitats, species richness*

- California Department of Fish and Wildlife Areas of Conservation Emphasis II
- Threatened and Endangered Species (CDFW)
- High and Very High Species Biodiversity Areas (CDFW)
- Very High and High Species Biodiversity Areas (CDFW)
- US Fish and Wildlife Service Critical Habitat
- National Marine Fishery Service Critical Habitat'
- Audubon Society Important Bird Areas
- Data from NCCP/HCPs
- Wetlands (NWI) and Vernal Pools (CDFW)
- Individual mitigation species models based on land on cover (CDFW VEGCAMP, CWRH), known occurrences (CNDDB) and observations (eBird, iNaturalist, GBIF, HerpMapper)
- Species requiring mitigation (TNC)
- Species biodiversity rank (CDFW)

*Habitat connectivity*

- Habitat connectivity and critical linkages (SC Wildlands, TNC)
- Fish passage barriers (CDFW)
- Regional Habitat Connectivity (TNC)
- Resilient Connected Network (TNC)
- Wildlife movement Barrier Priorities (CDFW)

*Plans and existing conditions*

- Land cover data (CDFW VEGCAMP, CWHR)
- Protected Areas and conservation easements (GIN)
- Farmland Mapping and Monitoring Program (DOC)
- Conservation plan density (Huber)
- Watersheds (USGS)
- Ecoregions (US EPA)
- Native American Reservations (SCAG)

## Co-benefits and Leveraged Opportunities

While RAMP focuses on actions to compensate for unavoidable impacts on special-status species, habitats, waters of the State, wetlands, and natural communities, RAMP investments to protect, restore or enhance resources can yield co-benefits that make RAMP investments attractive to communities and the regulated community. Examples of co-benefits include climate mitigation and resilience, water quality and supply, addressing past environmental harms to vulnerable populations such as Black, Indigenous and People of Color (BIPOC), access to parks and open space particularly for disadvantaged and underserved communities, public health benefits, and flood risk reduction. Multi-benefit conservation mapping tools, like greenprints, enable efficient and effective analysis for assessing the co-benefits of protecting, restoring or enhancing specific sites that have been identified as suitable for advance mitigation investments.

Water Resources: While RAMP incorporates compensatory mitigation for Waters of the State and U.S., wetlands and water quality, advance mitigation actions such as restoring riparian areas, protecting areas of high groundwater recharge and enhancing floodplains can yield co-benefits related to water availability, water quality, healthy freshwater habitats, and reduce climate risks to communities and ecosystems. Data that support water availability, conservation, quality and resilience goals include:

- Adjudicated groundwater basins (CA DWR)
- Hydrogeologically Vulnerable areas (CA State Water Board)
- Impaired waterways and waterbodies (U.S. EPA)
- Municipal drinking water supply watersheds (TNC)
- Critically Overdrafted Groundwater Basins (CA DWR)
- Priority Groundwater Basins (CA DWR)
- Water Stress (USGS)
- Water Quality Index (U.S EPA)
- Altered streams (USGS)
- Water quality monitoring sites (USGS)
- Groundwater recharge (USGS)
- Points of diversion (CA State Water Board)
- Runoff (USGS)

Climate mitigation and resilience: RAMP investments can reduce greenhouse gas emissions through carbon sequestration and avoided conversion, support community and ecological resilience and reduce climate risks. Data that support climate mitigation and resilience include:

*Carbon sequestration*

- Soil carbon (Hengl et al. 2017)
- Urban above-ground carbon (UC Davis)
- Wildland carbon (CARB)

*Resilient ecosystems*

- Refugia (UC Davis)

- Resilient Areas for Biodiversity (TNC)

*Resilient communities*

- Sea level rise (NOAA, TNC)
- 100 Year Floodplain (FEMA)
- Historic Wildfires (CAL FIRE)
- Fire Hazard Severity Zones (CAL FIRE)

Environmental Justice and Equity: Environmental Justice (EJ) is about equal and fair access to a healthy environment, with the goal of protecting underrepresented and poorer communities from incurring disproportionate negative environmental impacts. The SCAG region is demographically and economically diverse and displays the extremes in household income. The region includes heavily urban and entirely rural areas, as well as terrain that in some instances make achieving air quality goals challenging. A range of economic and social impacts such as health outcomes, education, employment, housing conditions, rates of incarceration and life expectancy vary vastly in this region based on race, income, and census tract. Institutional and system racism experienced by these communities continues to impact their access to more mobile, sustainable and prosperous futures in Southern California. The history of both the United States and California shows how race has played a role in the disparities and inequities that people of color experience today. Connect SoCal is designed to create region-wide benefits that are distributed equitably, while ensuring that any one group does not carry the burdens of development disproportionately. It is particularly important that Connect SoCal considers the consequences of transportation projects on low-income and minority communities, and avoids, minimizes or mitigates disproportionately high and adverse human health and environmental impacts on low-income and minority communities.[64]

RAMP can play a role in supporting EJ and Equity goals to the extent feasible and supported by the applicable resource agencies. RAMP processes can meaningfully involve vulnerable and underrepresented communities in advance mitigation decisions and projects; incorporate environmental justice and equity information early in impacts assessments to better allow for avoidance and minimization of impacts on low-income and minority communities; align advance mitigation investments to address EJ and equity needs such as access to open space, clean water and climate risk reduction; and prioritize location of advance mitigation projects close to the expected areas of impacts.

Models exist to incorporate EJ and equity into compensatory mitigation plans and projects. OCTA's criteria includes proximity to underserved areas and cultural and historical sites. The San Francisco Bay Conservation and Development Commission adopted policies[65] to better incorporate EJ and equity into mitigation decisions.

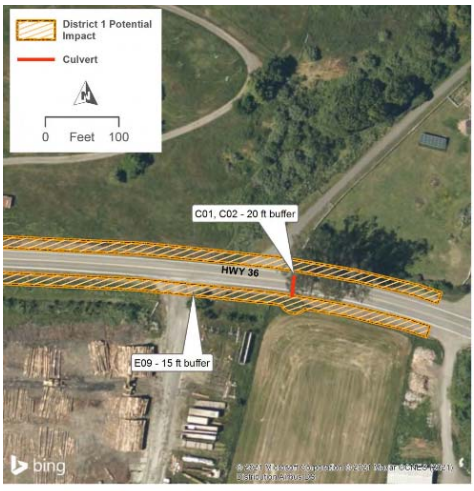
[64] Adapted from SCAG's Environmental Justice Toolbox: https://scag.ca.gov/sites/main/files/file-attachments/toolbox_environmentaljustice_final.pdf?1621573326
[65] See https://www.bcdc.ca.gov/cm/2019/1017BPA2-17SocialEquityEnvJusticeRec.pdf

Data that support EJ and equity goals include:

- CalEnviroScreen Pollution Burden (CA EPA)
- Communities of Concern (SCAG)
- Disadvantaged Communities (CA OEHHA)
- Environmental Justice Areas (SCAG)
- Healthy Places Index (SCAG)
- Publicly accessible recreational lands (GIN)
- Water Quality Index (US EPA)
- Toxic Release Inventory Facilities (CA EPA)
- Trails (composite of county, state, national data)
- Park access equity (Trust for Public Land)
- Urban Heat Island (UC Davis)
- Sequestration of NO2 and PM2.5 by vegetation (Gopalakrishnan et al. 2018)
- Priority Landscapes for Tree Planting (TNC)
- Urban Heat Island Gap (TNC)

## Infrastructure Assessments to estimate potential impacts

An important element of RAMP to guide advance mitigation investments for future projects is to estimate impacts to species, habitats, waters, wetlands, and natural communities that require mitigation. Predictive impact models – called transportation assessments -- are in use by transportation agencies, notably Caltrans, to provide an order-of-magnitude range of estimates for impacts on regulated resources. Agencies can then work to avoid and minimize potential impacts, reducing their mitigation obligation; if the impacts are unavoidable, agencies then can identify opportunities for advance mitigation that would address their future mitigation obligations. While the predictive models are most in use by transportation agencies, the approach can be adapted for other infrastructure projects and private development projects. The methods in use by Caltrans as described in Statewide Advance Mitigation Needs Assessment Report for SHOPP projects[66], generally follow those described by Thorne, et. al (2015)[67].



Project EFIS 0113000090 in Humboldt County
Activity Category: Safety – Collision Reduction
Back PM 0.1, Ahead PM 1.6

Once the scope of the region is determined, GIS files are developed of potential future projects that could possibly require mitigation. For each selected project, a footprint is estimated by applying two buffers to the project centerlines (for linear features) and center points (for features such as freeway interchanges). Project footprints are then developed using information such as location,

[66] https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/2020-q2-samna-report.pdf

[67] Thorne, J. H, Bjorkman, J., Boynton, R. M, & Huber, P. R. (2015). 2015 Mitigation Needs Assessment for Transportation Projects for the Sacramento Valley Pilot Project for Regional Advance Mitigation Planning. *UC Davis: Information Center for the Environment*. Retrieved from https://escholarship.org/uc/item/3cn8f3mz

extent and type of project. The buffer widths are based on models developed by Thorne, et. al and adapted/revised by Caltrans.[68]

The project footprints are overlaid with the conservation assessment/data including habitat and species models in GIS to estimate potential impacts from projects on habitats, species and natural communities. Results can be calculated for a range of potential impacts if more than one model is used as was done in the Bay Area Transportation Assessment.[69] These methods include the assumption that all resources within the footprints would be impacted by project construction. Because avoidance and minimization efforts will be used to reduce the overall impacts but cannot be easily spatialized, it is assumed that there is some degree of overestimation associated with the impact estimations. As noted, results should be considered for planning purposes only and not for permitting purposes.

Once the potential impacts of projects on habitats and species are developed, projected mitigation demand is then calculated. Mitigation needs often include a multiplier to the actual measured impacts. These ratios are species-and context-specific and determined by natural resources agencies during the normal environmental review process. Because these are not typically known in advance of environmental assessments of proposed projects, a generalized mitigation ratio (for example, 2:1) can be applied as a placeholder to help identify mitigation demand and can be adjusted.

Once the mitigation demand is determined, software tools like Marxan can be used to identify a portfolio of mitigation sites that meet predicted mitigation needs and conservation goals. Outreach to natural resource agencies, stakeholders and potential collaborators is also important to consider potential advance mitigation opportunities that align with agencies' priorities and policies and support potential partners' goals.

### SPOTLIGHT: TRANSPORTATION CORRIDOR AGENCIES

The Transportation Corridor Agencies (TCA) in Orange County has long been involved in mitigation to compensate for the impacts of the toll roads on habitats and species, and cites protecting open space areas, habitat connectivity and the wildlife within as one of the TCA's highest priorities. TCA was an early partner in and financial contributor the Orange County Central/Coastal NCCP/HCP that was approved in 1996 – one of the earliest NCCP/HCPs plans in the region. To date, TCA has conserved and restored over 2,000 acres of coastal sage scrub, wetlands, riparian and saltwater marsh at 17 different Orange County locations. It has also implemented wildlife-friendly undercrossings and fencing to protect mountain lions, deer and other species from being harmed on the roads. Today, the NCCP/HCP is managed by the Natural Communities Coalition which coordinates the land management, monitoring and research across the nearly 38,000-acre Reserve System. TCA continues to manage and restore open space and mitigation sites and monitors the use of the wildlife corridor projects.

See TCA environment for more information.

[68] https://dot.ca.gov/-/media/dot-media/programs/environmental-analysis/documents/env/2020-q2-samna-report.pdf see page 5-6

[69] Huber, P.R., 2019. *Bay Area Regional Advance Mitigation (RAMP): Impacts and Mitigation Needs Assessment Update.* Prepared for: The Nature Conservancy.

Data needed to support infrastructure assessments for potential impacts and to guide advance mitigation locations and activities include:

- GIS data that represent relevant projects to be assessed
- Conservation information included in the Conservation Assessment, such as habitat models, land cover data, species information, waters and wetlands data (see above for list).

## Partners and Collaborators

One of the benefits of RAMP is that it can broaden the opportunities for engagement with potential partners and collaborators who can help identify potential advance mitigation opportunities, reduce potential risks, and build broader support for potential advance mitigation projects. It can also increase transparency of actions. In many cases, the selection of RAMP implementation mechanisms and mitigation actions will be carried out under state or federal programs that require public review and comment. For example, the development of RCISs and MCAs includes requirement for public notice, review, and comment.

In addition to public engagement, RAMP can provide an opportunity for the public to learn about the program and its implementation. In fact, it is a best practice to pro-actively engage stakeholders and the public through committees or working groups. For example, OCTA has an Environmental Oversight Committee, the Western Riverside County Regional Conservation Agency has a Stakeholders Committee and a Board of Directors, and SANDAG has an Environmental Mitigation Program Working Group to help guide implementation of their respective advance mitigation programs.

In general, partners and collaborators can be organized around the functional workings of a RAMP initiative. Engagement would depend on the potential projects, natural resources, geographically based stakeholders and potential partners. They include:

- Those who need mitigation: Infrastructure agencies (transportation, energy and water), cities and counties (public works), housing developers
- Those who approve mitigation/the regulatory agencies: CDFW, USFWS, USACOE, USEPA, NMFS, Coastal Commission, Regional Water Boards.
- Those who supply and/or manage mitigation: habitat agencies, mitigation/conservation bankers, MCA sponsors, conservancies, land trusts, open space and park districts, cities and counties.
- Interested stakeholders: Local governments to ensure consistency with local land use, community members who care about local land use decisions

### Outreach conducted and feedback from partners and collaborators

SCAG and The Nature Conservancy staff interviewed potential partners and collaborators, with a focus on county transportation commissions (CTCs) given the potential opportunities and history of RAMP in the SCAG region and state. The interviews included:

- Ventura County Transportation Commission
- Riverside County Transportation Commission/Regional Conservation Authority
- Orange County Transportation Authority
- LA Metro
- San Bernardino County Transportation Commission
- Imperial County Transportation Commission
- Caltrans Districts 7 and 8
- Brightline West
- WRA/Land Veritas Mitigation Banking
- Transportation Corridor Agencies
- Friends of Harbors, Beaches and Parks

Comments and feedback from CTCs and Caltrans were largely positive toward RAMP and highlighted the potential benefits of RAMP, including:

- Addresses data gaps on conservation and potential impacts, providing input on land use, sharing data that is often hard to access and understand.
- Enhances cross-jurisdictional and cross-county collaboration and can help establish common approaches to achieving shared goals.
- Encourages continued collaboration between SCAG and CTCs to address mitigation at all scales, including project-by-project, at a county and regional where appropriate.
- Could provide incentives and more robust funding for advance mitigation.
- Provides solutions for reducing the impacts of projects.
- Increases information sharing, transparency and communications among agencies, partners, agencies and the public.
- Support for a multi-county approach, especially when collaborating across Caltrans Districts for development of conservation plans incorporating multiple species.
- Encourages collaboration with the environmental community and helps build support for projects.

Concerns expressed by CTCs and Caltrans about establishing a RAMP initiative in the region include:

- Potential duplication and/or conflicting mitigation efforts between regional, county, and local approaches.
- May hold a gap in direct application to local conditions.
- Timing on implementation of advance mitigation could be delayed or slowed based on an organization's priorities. More organizations involved can increase complexities.

Suggestions from CTCs and Caltrans on establishing a RAMP initiative in the region include:

- RAMP can be valuable across multiple sectors, not just transportation, and can help achieve the goals of Connect SoCal.

- There should be a menu of mitigation options and flexibility in approaches for counties – one size does not fit all.
- Be sure to focus on water resources in addition to biological resources.
- There should be transparent engagement with CTCs, partner agencies, and other infrastructure agencies.
- Consider different structural models depending on the scope of a RAMP initiative, including a joint powers authority.
- Consider pilot program to address specific needs where there currently is a gap in advance mitigation plans. For example, an initiative to address declining and potential listing of species and large habitats, such as mountain lions and Joshua trees (both currently candidates for listing).

Feedback from other organizations include:

- RAMP can bring private and public entities together toward a common goal.
- RAMP increases public awareness of environmental resources.
- Support for a multi-county approach, especially to address gaps in RAMP plans and advance mitigation mechanisms.
- Support for development of a credit system that could provide consistency across management of multiple mitigation banks.
- Strong interest in collaborating on advance mitigation, specifically multi-agency advance mitigation projects.
- Support for conservation assessments and greenprints to provide easy access to environmental, climate, environmental justice, and other data.

## Scope, Scale and Models

SCAG's region is vast, covering six counties, 191 cities and spanning over 25 million acres. The region includes geographic diversity, with five ecoregions and dozens of watersheds. Established plans in the region are largely organized by jurisdictions and managed by local governments, with the exceptions of Caltrans' Regional Advance Mitigation Needs Assessments and the Desert Renewable Energy Conservation Plan. While many plans have jurisdictional boundaries, conservation values and dynamics often transcend jurisdictional boundaries, such as habitat connectivity, wildlife corridors, ecological climate migration, large sensitive habitats, climate risks (wildfire, flooding, sea level rise). In addition, linear infrastructure such as roads, rail lines and transmission lines, travel through jurisdictions. Thus there may be a need to consider RAMP at a larger scale, to encourage collaboration among existing plans' agencies, share information, consider partnerships, identify gaps in advance mitigation plans and provide other support.

That said, there are limitations with scope and scale of advance mitigation activities due to the regulatory nature of compensatory mitigation and established policies. Compensatory mitigation must be designed to offset unavoidable adverse impacts on habitats, species, and aquatic resources.

Regulatory agencies support equivalence, or the principle that offsets should provide habitat, functions, values, and other attributes that are similar in type ("in-kind") and proportionate to those affected by the project. There may be some instances where "out-of-kind" offsets may be appropriate, such as when offsets can benefit a habitat type of conservation values that are of higher significance than those affected by a project, and offsets demonstrably provide a greater contribution to landscape-level conservation goals.

Given the complexity of compensatory mitigation, mitigation principles have been suggested by organizations as best practices, and many have been embedded in policies. Principles such as landscape-level approach and context, mitigation hierarchy, larger scale, equivalency, durability, assurance, additionality, scientific, location and advance mitigation are often cited as important to ensure successful mitigation.[70]

Thus, the scope and scale of advance mitigation activities are guided by resource agency approvals and limitations but can also be flexible and designed to meet the goals of the needs.

## Models

The following are models can be instructive when considering a how SCAG can support RAMP in the SCAG region.

*OCTA Measure M2, SANDAG TransNet:*

- Type: established RAMP programs for a defined set of transportation projects through sales tax initiatives
- Administration: managed by transportation agencies, guided by an oversight committee, or working group, final decisions on mitigation rest with regulatory and transportation agencies
- Planning: conservation assessments, conservation reserve designs for MSHCP (OCTA transitioned to an NCCP/HCP, SANDAG prioritizes investing in the MSHCP but is not bound by it)
- Funding: sales tax for transportation, set-aside for mitigation in the measures; draw-down model for defined projects in the measures

Both OCTA[71] and SANDAG[72]'s advance mitigation programs were initiated by sales tax measures for the defined list of transportation projects. As mentioned earlier, OCTA set aside $243.5 million representing 5% of the cost of the freeway improvement projects in the measure. SANDAG's TransNet measure identified $850 million for mitigation: $650 million for advance mitigation of regional and local transportation projects (determined by estimating the cost of mitigation for each project) and $200 million for regional habitat acquisition, management and monitoring, based on expected cost savings (or economic benefit) from advance mitigation. Both programs and policies emphasized the benefits of buying land early at lower costs and in larger parcels and use it for future needs. Both programs achieved cost savings due to the flexibility advance funding provided them to time acquisitions for favorable real estate market conditions and avoid cost escalations, and to identify land acquisitions with

[70] See NEBA Mitigation Principles, TNC Mitigation Principles and USFWS ESA Compensatory Mitigation Policy 2016
[71] http://www.octa.net/About-OC-Go/OC-Go-Environmental-Programs/Environmental-Mitigation-Program/
[72] https://www.keepsandiegomoving.com/EMP-Group/EMP-intro.aspx

high conservation values. Both programs take a comprehensive approach to compensatory mitigation and permitting, engaging regulatory agencies regulating species and terrestrial habitats and agencies regulating water, wetlands, and aquatic species – an important element for transportation agencies.

*Western Riverside MCSHP and Coachella Valley MSHCP*[73]*:*

- Type: Natural Communities Conservation Plans/Habitat Conservation Plans
- Administration: public agencies (Western Riverside County Regional Conservation Authority and Coachella Valley Conservation Commission – joint powers agency)
- Planning: Detailed science and conservation planning to identify a conservation reserve design and priority
- Funding: state and federal planning grants for development of the MSHCPs, development fees for permitting provided by project proponents, federal and state habitat conservation funding for plan implementation (unrelated to mitigation).

As mentioned above, NCCP/HCPs are federal and state habitat conservation plans designed to achieve multi-species landscape scale conservation goals while providing streamlined environmental permitting for development projects that participate in the plan. The SCAG region includes four approved MSHCPs. In addition to the two highlighted here, the OCTA NCCP/HCP is the outgrowth of the M2 Environmental Mitigation Program, and the Orange County (Central/Coastal) NCCP/HCP was approved in 1996. Due to the decades-long regulatory coverage and scientific and management complexities, the planning and development of NCCP/HCPs is a difficult process and takes many years to complete. Once approved, though, NCCP/HCPs are the most successful, highly efficient, and effective regional advance mitigation planning tools available.

*Caltrans AMP:*

- Type: Ongoing program of advance mitigation for state (SHOPP) and regional transportation (STIP) projects supported by a self-sustaining revolving fund, established by SB 1 (2017) and guided by SB 103 budget trailer bill (2017).
- Administration: Caltrans Advance Mitigation Program.
- Planning: Caltrans developed its planning process by guidelines, includes a Statewide Advance Mitigation Needs Assessment and a Regional Advance Mitigation Needs Assessment that incorporates conservation information and future transportation projects.
- Funding: SB 1 established the Advance Mitigation Fund in Caltrans, funded by no less than $30 million/year of SHOPP and STIP funding for four years.

SB 1 established an Advance Mitigation Program at Caltrans with the primary goal of "…address[ing] long-term future biological mitigation needs resulting in improved environmental, economic and project delivery outcomes." The purpose of the legislation is to: 1) accelerate transportation project delivery; 2) enhance communications between Caltrans and stakeholders to protect natural resources through project mitigation, to meet or exceed applicable environmental requirements, and to mitigate, to the

[73] https://www.cvmshcp.org/

maximum extent required by law, environmental impacts from transportation infrastructure projects; ensure Caltrans consults with the CA DFW on all aspects of the program, and to enhance communications with the other natural resource agencies and other stakeholders; and to ensure that the Advance Mitigation Account is self-sustaining.[74] Caltrans and all relevant regulatory and resource agencies have signed a Statewide Advance Mitigation MOU[75] outlining processes. To date, Caltrans has developed RAMNAs for 6 districts and more are in development. The first advance mitigation project that was approved for funding is in District 8 (San Bernardino County) for 42 desert tortoise credits, 1 wetland credit and 27 desert ephemeral wash credits at a cost of $8.1 million, expected to benefit four future transportation projects.

The legislation enables regional transportation agencies to benefit from the program, but their role is currently limited. Caltrans identifies the Geographic Areas of Interest based on potential SHOPP advance mitigation needs and does not assess regional transportation projects for potential impacts, given the sheer volume of projects and staff capacity. Caltrans is including potential STIP projects from regional transportation agencies to be included in RAMNAs. Caltrans indicates it would offer to sell advance mitigation credits to other transportation agencies only if Caltrans is unable to use them, limiting the opportunities for shared mitigation projects. Given the complexity of the program and the early nature of implementation, Caltrans continues to iterate to deliver on the goals of the program. That said, Caltrans staff note that they are already seeing benefits in achieving the goals of the program through the planning process, collaboration internally and externally with partners and stakeholders.[76]

*North Carolina Ecosystem Enhancement Program/Division of Mitigation for CWA 404:*

- Type: State mitigation program for water resources mitigation.
- Administration: Division of Mitigation, NC Department of Environmental Quality
- Planning: Multi-scale watershed planning approach.
- Funding: State DOT funding established the initiative; today funding for mitigation actions are provided through In-Lieu Fee programs.

Prior to initiating advance mitigation, traditional project-by-project water resource mitigation obligations were shown to significantly delay projects undertaken by the North Carolina Department of Transportation (NCDOT). To address this issue, over 10 state and federal level resource agencies started to meet in 2001 to find a more programmatic approach to resolve mitigation requirements. The solution was an innovative 2003 partnership between the USACE, North Carolina Department of Environment and Natural Resources and NCDOT that established the Ecosystem Enhancement Program. Today, the Division of Mitigation Services (DMS) is a NC Department of Environmental Quality initiative that restores and protects streams, wetlands and riparian buffers while offsetting unavoidable environmental damage from economic development. DMS developed four In-Lieu Fee mitigation programs that private and public developers can use to meet state and federal compensatory mitigation requirements for water resources only: streams, wetlands, riparian buffers and nutrients. DMS uses

[74] Caltrans AMP 2021 Report to the Legislature
[75] 2021 Statewide Advance Mitigation MOU
[76] Personal communication with Caltrans advance mitigation staff from Districts 7 and 8, 9/9/2021

receipts from the In-Lieu Fee programs to work with state and local partners and willing landowners to identify and concentrate mitigation resources in areas where they will have the greatest benefit to the watershed guided by a multi-scale watershed planning approach. NCDOT is a regular user of the DMS to advance their projects in a timely and cost-effective manner.[77]

*Colorado Department of Transportation Shortgrass Prairie Initiative (2002- 2022)*:

- Type: program limited to advance programmatic clearance for 20 years of highway projects in large scale shortgrass prairie habitat for three listed species and 20 species in decline, to aid in their recovery to help prevent listing.
- Administration: CDOT and Colorado Division of Wildlife.
- Planning: Ecoregional planning by The Nature Conservancy.
- Funding: CDOT provided funding for advance mitigation, established an Environmental Revolving Fund, repaid by assessing transportation projects that receive a benefit.

The FHWA, Colorado Department of Transportation, the US FWS, Colorado Division of Wildlife and The Nature Conservancy came together to design an impact assessment and advance mitigation process to aid in the recovery of declining species on Colorado's Eastern Plains. The Initiative provided programmatic clearance for CDOT activities on the existing road network for twenty years, addressed 3 species and 20 species that were not listed as threatened or endangered, but were at threat of becoming listed in the future, and covered 90,000 acres of right-of-way in four of CDOT's six regions. The agencies invested resources on a comprehensive and proactive conservation plan (rather than a project-by-project approach) to help alleviate the need for further listings and improve project delivery certainty. Conservation experts and the CO Division of Wildlife identified habitat conservation sites based on prior eco-regional planning. Implementation mechanisms identified in the Memorandum of Agreement included Biological Assessments, Biological Opinions, HCPs, Candidate Conservation Agreements, Conservation Banks or Safe Harbor Agreements. The project resulted in programmatic clearance with 1:1 mitigation ratio, regulatory streamlining, cost savings and more effective habitat and species preservation.[78] CDOT provided funding for outside parties to acquire properties with the intent that the transportation projects would reimburse the state for mitigation credits as they were used. CDOT created an Environmental Revolving Fund which was repaid by assessing transportation projects that received a benefit from an advance mitigation project.

*Regional Conservation Investment Strategies / Mitigation Credit Agreements*

- Type: RCIS is a conservation investment strategy; an MCA is an advance mitigation instrument
- Administration: A public agency sponsors development of an RCIS; any entity (public or private) can develop an MCA.
- Planning: An RCIS is the planning context for conservation goals and objectives and integrates infrastructure and land use information.

[77] https://deq.nc.gov/about/divisions/mitigation-services
[78] https://trid.trb.org/view/726668

- Funding: Funding is available to prepare an RCIS through the Wildlife Conservation Board; project proponents would likely fund Mitigation Credit Agreements.

As mentioned earlier, an RCIS is a voluntary, non-regulatory conservation planning tool that identifies habitat needs, conservation values, goals, and objectives in a defined region. Once an RCIS is approved by CDFW, an entity can develop a Mitigation Credit Agreement and create advance mitigation credits by implementing the conservation or habitat enhancement actions identified in the RCIS. The credits may be used as compensatory mitigation for impacts under CEQA, CESA, and the Lake and Streambed Alteration Programs. In the SCAG region, the Antelope Valley RCIS is approved, and the San Bernardino County RCIS is under development, led by the San Bernardino County Transportation Authority. There are currently three MCAs under development in California. CDFW is expected to issue draft guidelines in the coming year.

## Funding and Financing

One of the benefits of RAMP is reduced costs of mitigation. Research from UC Davis summarizes the categories of potential cost savings which may be achieved through the RAMP approach, through: avoided mitigation costs (by acquiring land early avoiding escalating prices, or timing conservation actions with favorable real estate cycles); economies of scale (by bundling mitigation for larger conservation actions with fewer administrative actions); avoided procedural costs and delay.[79] Interviewees for this White Paper also aligned RAMP's role in enabling certainty of actions and reduced project risks with cost savings. Existing programs in Southern California have seen cost savings from RAMP approaches.

- OCTA anticipates specific transportation projects would have had to incur an additional $700,000 to $2.5 million (in 2018 dollars) in mitigation-related costs and unknown schedule risks had the environmental mitigation program not been in place.[80]
- Efficiencies generated from the Western Riverside County Multi Species Habitat Conservation Plan has resulted in an estimated $390 million in savings part through expediting freeway and road projects by as many as five years and through efficiency in conservation actions.[81]
- In 2013, SANDAG reported that land acquisition costs per acre were roughly half the original estimates, and that mitigation requirements were fulfilled for all the high-priority projects included in the TRANSNET Ten Year Early Action Program in six years.[82]

The complexity of mitigation processes, data limitations, the variability of real estate cycles and market costs make it difficult or impossible to estimate generalized cost savings. That said, available reports on

[79] Task 3 Report: The Business Case for Advance Mitigation in California. (2015) Final Research Report UCD-ITS-RP-15-03. Sciara, Gian-Claudia; Stryjewski, Elizabeth; Bjorkman, Jacquelyn; Thorne, Jim; Schlotterbeck, Melanie. https://escholarship.org/content/qt1v80g85w/qt1v80g85w_noSplash_8487658cf7b79c3c63b3f22af987549c.pdf
[80] See page 36, OCTA Measure M2 Quarterly Progress Report, Q2 of FY2021-2022 https://www.octa.net/pdf/M2FY21-22Q2Report.pdf
[81] RCTC/RCA Workshop Presentation August 28, 2017.
[82] https://www.keepsandiegomoving.com/Libraries/Lossan-doc/2285-EMP_Brochure-Dec2013_4WEB_1.sflb.ashx

advance mitigation almost always cite cost savings (from elements such as avoided cost escalation, faster project delivery, economies of scale, reduced risk) as a major benefit of the approach.[83]

Robust funding availability is an important part of RAMP given its regional and advance features. Mitigation is typically included in the cost of a project and disbursed after environmental review and mitigation requirements are identified. RAMP requires no new funding – projects' costs include estimated mitigation funding. Funding RAMP requires a *shifting* of mitigation dollars – from funding embedded in each project to aggregated funding and available in advance. A typical (e.g., non-RAMP) mitigation funding approach is for one project (vs. aggregated projects) and at the end of a project's development timeline (vs. in advance). In addition, infrastructure and development projects typically have several funding sources with their own rules and restrictions making funding projects a complicated art. Thus, initiating mitigation actions to support estimated impacts for a suite of projects in advance of environmental review is difficult to do, especially with existing funding streams and funding processes. This is particularly relevant for transportation projects. As such, current processes do not support RAMP effectively or efficiently. As a UC Davis research report on RAMP for Caltrans notes, "Finding the financial means to achieve successful implementation of advance mitigation is challenging and requires adapting and developing appropriate strategies and modifying organizational and legal barriers that block the capabilities of existing institutions."[84] That said, advancements over the recent years have created opportunities and solutions to make it easier, though more work needs to be done.

Funding needs for RAMP include three cost categories: planning and administration, capital costs for mitigation actions and stewardship of mitigation lands.

Planning and administration are important activities to ensure a strong planning framework for RAMP investments, efficient and effective administration and management of the activities or program. Depending on the scope of RAMP activities and management structure, planning and administration activities may include planning documentation development or updates as necessary (such as the conservation and impacts assessments), stakeholder engagement, financial projections and budgeting, database management, template and necessary agreement creation and consultant oversight.

The costs associated with mitigation actions are typically capital costs, which include the associated activities that are required for mitigation projects. The specific needs will be determined by the type of mitigation action that is most appropriate. For example, the elements will differ if purchasing credits at an existing mitigation or conservation bank or participating in an NCCP, or agency sponsored mitigation or conservation bank, or developing and implementing a Mitigation Credit Agreement. For mitigation approaches involving an agency-sponsored, partial or full-delivery bank, costs could include (but not limited to): purchase of land or conservation easements, restoration and enhancement costs, legal and real estate documents and fees, technical memoranda/reports on the site(s), development of restoration/engineering plans and management and monitoring plans.

[83] Ibid.

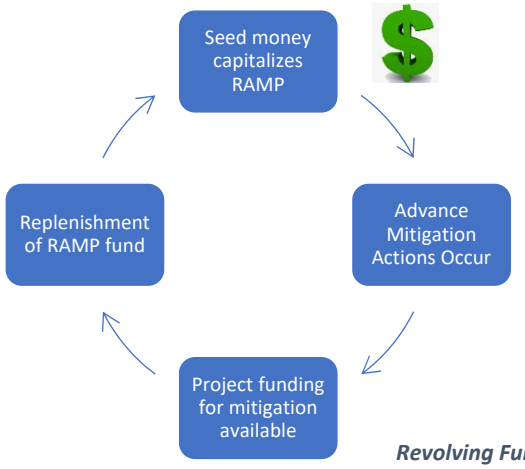
[84] Task 4 Report: Funding and Financial Mechanisms to Support Advance Mitigation. (2015) Final Research Report UCD-ITS-RP-15-04. Lederman, Jaimee; Wachs, Martin; Schlotterbeck, Melanie; Sciara, Gian-Claudia. https://escholarship.org/uc/item/9pg390n3

Compensatory mitigation requires stewarding the mitigation lands in perpetuity, often funded by an endowment. Without a long-term management and stewardship commitment, mitigation lands may become degraded through inappropriate uses, invasion of exotic species, wildfires, or other unanticipated events. The biological features that the mitigation sites were designed to protect can be lost without active stewardship, monitoring, and the means to implement adaptive management if needed. Endowments are the typical mechanism used to support long-term management. Income generated by endowments cover the costs of management tasks such as invasive species control programs, fence maintenance, signage, fire management, monitoring and reporting, adaptive management, and administrative expenses such as personnel, accounting, legal, and insurance. RAMP facilitates improved efficiency and lower costs, due to such factors as better understanding of needs, economies of scale, time savings, and less frequent need to make critical mitigation purchases under duress[85].

## Funding Frameworks

There are three primary approaches for funding RAMP that align with regional/multiple projects and advance features: revolving fund, one-time set aside for defined projects and programmed funds. It is important to note that advance mitigation investments must be for a suite of projects and cannot be tied to specific transportation projects because that would hinder multi-project planning and would preclude mitigation for anticipated impacts years before project implementation – in other words, an advance mitigation investment for one project would be considered pre-decisional.

The first funding approach, a self-sustaining revolving fund requires a capital investment into an account that is expended for future mitigation credits. Under this scenario, mitigation properties or credits are purchased initially using seed money, then, as project environmental documents are finalized and mitigation actions are agreed upon, the project funds would cover the cost of the mitigation. Those funds would be re-deposited in the fund to purchase more mitigation for future projects. This non-depleting fund allows a sustained approach to support advance planning for long-term mitigation and conservation work. Caltrans' Advance Mitigation Program uses this approach with capital from SB 1 (from SHOPP and STIP) to infuse an Advance Mitigation Account with no less than $30 million over four years.




***Revolving Fund***

The second funding approach, a one-time set aside for defined projects requires a source of funds that is available in advance for mitigation for a suite of projects. As the mitigation is implemented, that source is reduced until it is expended. OCTA's Mitigation Program for M2 Freeway Projects and SANDAG's TransNet Environmental Mitigation Program employ this framework. Both OCTA and SANDAG's programs were established by voter approved sales tax measures, which included a set aside of roughly 5 percent of the cost of defined projects in the measures. The

[85] UC Davis Institute for Transportation Studies, 2014

funding was available early in the measures' program, allowing acquisition, restoration, and management actions to be implemented in advance of project development.

The third funding approach is programming funding from future projects and making it available well in advance of project development. This is similar to the one-time set aside in that there is a defined list of projects with estimated costs of mitigation identified for the suite of projects. Since mitigation funds typically are included as part of a project, this would not require more funding; it is essentially separating the mitigation cost from a suite of projects and programming those funds as a mitigation project to be expended in advance of transportation project delivery. Caltrans uses this technique of identifying advance mitigation as a project that follows the traditional project approval process.

## Potential Sources of Funding

Funding to support RAMP could come from a number of sources. Generally, though, mitigation projects, including advance mitigation, is funded either upstream or downstream by the project that is responsible for the impacts. Thus, infrastructure and development projects are the source of funding for mitigation, including advance mitigation. That said, there are many sources of funds for transportation, infrastructure and development projects, and each source has its own advantages and limitations. What follows is a general list of potential sources of funding for RAMP.

Transportation funding at all levels (local, regional, state, federal, private) are eligible for mitigation activities. However, the nature of funding advance mitigation for multiple future projects does not fit the regular mode of transportation funding approvals, so there are complications that need to be addressed. While many of the current programs have resolved some of the issues, complications continue to exist.

- Federal transportation funds are generally eligible for mitigation on a per-project, reimbursable basis making implementation of RAMP difficult. While existing federal transportation policies and statutes support RAMP eligibility, the mechanics and accounting/bookkeeping of the federal-aid highway process (again, per-project, reimbursable) prevents a solution that avoids the complications. After productive discussions with FHWA, Caltrans opted to fund advance mitigation projects using the state's Advance Mitigation Fund (state only), and projects that use the credits from an advance mitigation investment can reimburse the Advance Mitigation Fund with federal transportation funds. This way, the federal funds reimburse past investments, and the use is on a per-project, reimbursable basis that is consistent with current FHWA practices.

- State transportation programs that can be used for advance mitigation include the Advance Mitigation Program funds managed by Caltrans, for SHOPP and STIP projects, established by SB 1 (Beall, 2017). Regional and county transportation agencies can partner with Caltrans on mitigation projects by planning together and purchasing mitigation credits that Caltrans creates. In the SCAG region, Caltrans district staff often help with environmental clearances of regional projects, so coordination may be easier. Since mitigation is an eligible project expense, other state transportation accounts, such as Local Streets and Roads, Active Transportation Program, accounts that provide funding for rail and transit and other projects in SB1, could be used to

subsequently purchase established advance mitigation credits, or participate in an existing NCCP/HCP for example, on a per-project basis, or along the lines of a RAMP approach through bundling mitigation funds for multiple projects.

- Local transportation funds have been used to initiate regional advance mitigation programs through sales-tax measures as was done in Orange, San Diego, and Riverside Counties.

- Regional transportation funds can support advance mitigation planning and projects, and support collaboration and coordination with partners, collaborators, and agencies.

Water infrastructure funding can also be used to participate in advance mitigation planning and projects, as mitigation is an eligible expense for water infrastructure projects. Water agencies have developed and implemented advance mitigation programs and projects to create habitat enhancement and mitigation sites. California Department of Water Resources (DWR) has funded advance mitigation projects to support the Central Valley Flood Protection Plan[86]. Currently, DWR's Delta Ecosystem Enhancement Bulk Credit Program[87] enables Reclamation Districts to acquire mitigation bulk credits at Westervelt Ecological Services mitigation bank. In another example, Reclamation District 108 sponsored the Mid-Sacramento Valley RCIS to encourage the development of Mitigation Credit Agreements that provide high quality habitat for focal species, meet important mitigation needs for state and local flood infrastructure maintaining agencies, and support local farmers in a new restoration economy.[88]

While conservation funding is not allowed to be used for mitigation, there may be opportunities to jointly fund a project using mitigation and conservation funds. This would allow the purchase, restoration or enhancement action that alone may exceed mitigation needs but is considered a conservation priority. A diversity of funding sources could also help fund elements of projects using different funding sources that are aligned with those purposes. For example, certain funds can be used for endowments but others (e.g., bond funds) cannot. Having a diversity of funding sources can help address certain needs. That said, a diversity of funding sources requires transparent accounting to ensure that mitigation funds are spent on mitigation needs.

External Financing relies on non-governmental organizations or private-sector parties to provide initial funds for advance mitigation actions, either in direct coordination with governmental agencies or developers or on a speculative basis. It requires the financial participant to believe that there will be a ready market for the project or the mitigation credits arising from the project[89]. The visibility of mitigation demand is critical to provide information to understand the market for future credits. Private capital is most viable to create mitigation or conservation banks, in-lieu fee programs and Mitigation Credit Agreements, which involve selling credits (for banks and potentially MCAs) and paying fees (in-lieu fee and NCCP/HCP programs) based on a known or anticipated pipeline of projects. RAMP impact

[86] Appendix B, Advance Mitigation, Central Valley Flood Protection Plan Conservation Strategy
[87] DWR Ecosystem Enhancement Advance Mitigation
[88] Mid-Sacramento Valley RCIS
[89] "Alternative Procurement, Financing, and Delivery of Advance Mitigation for Public Infrastructure Projects" (2014). Lloyd, Barbara A. and Martling, James W., Caltrans' P3 Financial Advisory Team Members

assessments, RAMNAs, Sub-regional Assessments[90] (as have been conducted in the Bay Area) and RCISs help to provide that transparency.

## Authorities, Potential Roles and Responsibilities

SCAG, a joint powers authority covering six counties in Southern California, is designated under state law as a Regional Transportation Planning Agency and a Council of Governments and under federal law, as a Metropolitan Planning Organization. SCAG develops long-range regional transportation plans including the sustainable communities strategy and growth forecast components, regional housing needs allocations and a portion of the South Coast Air Quality management plans. The 86-member Regional Council, the governing body, represents cities and counties in the region, and includes representation from Native American tribes and Air Districts. In addition, the six County Transportation Commissions hold the primary responsibility for programming and implementing transportation projects, programs and services in their respective counties.[91] While SCAG has expertise in land use and infrastructure planning, data and tool development and provision, funding, collaboration and convening, and alignment with state and federal statutes, SCAG does not implement infrastructure or development projects – those are implemented by the CTCs, cities, infrastructure agencies and developers.

### Potential roles for SCAG in a RAMP Initiative

With the above in mind, it is importation to consider potential roles and responsibilities for SCAG in a regional RAMP initiative that provides support, addresses existing gaps and needs, and adds value to existing partners and members (such as CTCs, Caltrans, cities and counties), as well as to habitat agencies, the mitigation community, environmental and EJ stakeholders, and others. Guided by feedback, the following are potential roles for SCAG in a RAMP initiative. SCAG could engage in one or more of the roles, depending on need, value to the effort and guidance and support from partners. In all of the roles listed below, SCAG would collaborate with the partners and collaborators to ensure the work helps deliver on the goals of RAMP.

Information provider: Consistent with SCAG's robust and innovative data and tool development, availability and provisioning, SCAG could provide a central location (or "one stop shop" as one interviewee called it) to host and support data and information that is necessary and supportive of RAMP, including information for the conservation and impacts assessments, multi-benefit information such as a greenprint, and tracking existing and potential advance mitigation activity. It could also develop a tool similar to the mitigation wizard in the Bay Area to enable infrastructure planners to easily engage in mitigation planning. Other information such as funding opportunities and templates could be provided.

Mitigation Planner: Given SCAG's expertise in long range and strategic planning, and support for infrastructure and conservation planning, SCAG could develop and maintain regional mitigation plans that include information on potential mitigation demand and supply that help to identify potential future mitigation needs and opportunities for the RAMP community.

[90] East Bay RAMP Sub-Regional Assessment and Santa Clara County Sub-Regional Assessment
[91] Adapted from the About Us page on SCAG's website.

Convener and coordinator: As the regional MPO and a joint powers authority composed of Southern California county and cities, SCAG hosts many working groups and collaborations with specific focus areas. The likelihood of successful RAMP outcomes is improved if existing and potential partners are engaged throughout the process. This engagement is particularly important to leverage the deep expertise that exists in the region from the many NCCP/HCPs and RAMP programs to share information, mentor emerging programs, catalyze new partnerships and potential initiatives, and provide guidance from lessons learned in the region. Critical to this effort would be efficient engagement with natural resource agencies for their guidance on the RAMP processes, data, and acceptance. Discussions could involve developing shared tools and information, identifying opportunities, supporting specific needs, exploring potential initiative or projects that transcend jurisdictional boundaries, and advocating for policies at the state and federal levels.

Hub for a mitigation marketplace: SCAG could host a 'mitigation marketplace' that connects those who need future mitigation (infrastructure, development) with potential suppliers of mitigation (bankers, habitat agencies, MCA sponsors, land trusts). Supporting the mitigation marketplace could be the mitigation planning, information and tools, collaboration with regulatory agencies, guidance on mechanisms and templates and access to funding.

Funder: While SCAG could fund any of the needed activities, it would be important to clearly identify the goals and objectives of a potential SCAG investment, and the gaps that such investment would close. Experience has shown that early access to robust funding is critical to ensure RAMP goals are met -- reduced costs for mitigation, larger more effective conservation, flexibility to invest during ideal market conditions, and expedited project delivery. An analysis of funding needs, sources and mechanisms would help identify opportunities, limitations, and barriers. Mitigation accounting and bookkeeping practices are important to ensure that funding is transparent and tracked to success metrics. Following the Caltrans AMP model, SCAG could establish a self-supporting revolving fund and provide seed funding to enable an ongoing program.

Uses of SCAG funding could include planning and engagement activities, advance mitigation and conservation actions. For example, funding could support existing programs in the region (such as NCCP/HCPs), capitalize RAMP projects (through mechanisms such as an MCA, banks), and close a funding gap for valuable acquisitions or restoration projects that are not entirely funded by mitigation requirements.

Mitigation sponsor: There may be opportunities for SCAG to take a more active role in advance mitigation if it is determined that there are gaps in mitigation plans, initiatives, projects or RAMP functionality in the region that could be addressed given SCAG's expertise, access to funding, and other benefits. For example, if provided with further direction from the Regional Council, SCAG could work with partners to:

- Sponsor an RCIS that would enable MCAs in regions that are not covered by RAMP plans.
- Develop/sponsor in-lieu fee programs, MCAs or banks in areas that are lacking RAMP mechanisms.

- Pilot RAMP for emerging conservation and mitigation challenges, such as habitat connectivity and potential listings of wide-ranging species (e.g., mountain lion and monarch butterfly), or large-scale habitat (e.g., Joshua Trees), that may not be adequately addressed in existing plans and programs.

### Partner Roles

A RAMP initiative would serve to leverage existing expertise from around the region to provide value and uplift to existing programs and fill gaps where they exist in capacity, planning and implementation. Staff from habitat agencies (e.g., those who administer the NCCP/HCPs), Caltrans advance mitigation, environmental planning staff from other transportation agencies, utilities and water agencies, regulatory agencies, land managers, land use planners, the conservation community, developers – each has a valuable role and expertise to play. Involvement would depend on each partner and collaborator's needs, expertise, and capacities to ensure efficient and effective engagement.

## Recommendations

While a number of regional advance mitigation planning plans and programs exist in the SCAG region, opportunities exist to address current gaps in RAMP coverage, planning tools, collaboration and coordination, capacity and funding. Given SCAG's regional scope, its existing partnerships and relationships, its robust data and infrastructure planning expertise, and its commitment to project delivery and conservation outcomes, SCAG is well positioned to support RAMP in the region. It is important to note that there is no intention for SCAG to assume total responsibility for RAMP in the region. All activities supported by SCAG would be voluntary, and promote flexibility in options and actions. As noted by many experts, given the size and diversity of the region, one size does not fit all. As SCAG, partners and collaborators explore more deeply the possibility of a RAMP initiative in the region, specific tasks can be pursued that can help inform decisions as the conversation continues. To that end, recommendations for SCAG to consider as potential next steps include:

### Finalize the draft Regional Advance Mitigation Program Policy Framework

The research and outreach presented in this white paper provides background information to support broader policymaking around SCAG's goals and potential role in supporting Regional Advance Mitigation in the SCAG region. Early findings from the white paper were shared at SCAG Regional Advance Mitigation—Advisory Taskforce Group meetings alongside presentations from implementing agencies that were engaged as part of the white paper development process. As SCAG finalizes the Policy Framework, the white paper should continue to serve as a resource for understanding the opportunities and challenges of pursuing RAMP, including the data needs and resources SCAG should consider in establishing a science-based approach and data policies to guide the development of the Greenprint tool. The Policy Framework can also guide staff in considering which of the following potential next steps are most valuable to pursue by providing clear policy direction on SCAG's goals and role in supporting RAMP.

## Identify the potential demand for advance mitigation

Initiate the planning process that will identify potential demand for advance mitigation in the region, including: 1) the resources (species, habitats, and natural communities) that may need compensatory mitigation in the future; 2) identified by county, ecoregion and watershed; and 3) advance mitigation plans and mechanisms that exist and current gaps. This would involve integrating a conservation assessment and an impacts assessment. In order to test this process, it may be prudent to limit the process by sector (e.g., transportation, or transportation and energy), by geography (e.g., a county not currently covered by a plan such as San Bernardino County to leverage its RCIS, an ecoregion or watershed) to test the approach and determine optimal scale. The result would give an order of magnitude mitigation demand and recommendations for potential RAMP projects.

## Evaluate regional network and collaborative opportunities

Evaluate regional network and collaborative opportunities through a study that would identify recommendations for potential RAMP initiative partnerships, structures, models, stakeholder engagement options, and methods. There should be careful consideration for the role of regulatory agencies in the effort given their deep expertise in conservation challenges and priorities, mitigation policies and process, and their position as decision makers and approvers of mitigation.

## Explore addressing gaps in RAMP plans and mechanisms

Identify gaps in RAMP plans and mechanisms and explore opportunities to close those gaps by supporting implementation agencies in developing new or partnership efforts. NCCP/HCPs, RCISs, RAMNAs (for Caltrans), in-lieu fee programs and mitigation/conservation banks currently exist in the region. Where there are gaps, consider supporting the development of plans such as RCISs to enable advance mitigation in the region.

## Financial assessment and modeling

Develop a paper on options for funding and financing RAMP in the SCAG region. The scope of this white paper was limited to identifying funding approaches and potential sources of funding for RAMP in the region. Further exploration is needed to identify potential funding needs, financial modeling for the funding approaches and a potential cost model that reflects the wide-ranging real estate values in the region. The complexities associated with these assessments and modeling are significant; limiting the scope to areas of interest and promising needs may be prudent.

## Consider supporting pilot project based on emerging needs

Research and conversations conducted to inform this white paper yielded many interesting ideas, one of which was to consider implementing a pilot project that may address a critical emerging need in the region that existing plans and programs are not currently equipped to handle: the possibility that wide ranging species – mountain lions and/or monarch butterflies, or Joshua Trees that exist on vast geographies in the region, may be listed as threatened or endangered. Early mitigation actions that protect such species could assist project proponents to get ahead of potential mitigation requirements and support conservation goals. A pilot project to support the health of such iconic species may also support public education goals on the benefits of RAMP. It would be important to assess interest from member agencies and transportation partners in leading a pilot supported by SCAG and to leverage

existing RAMP plans (such as San Bernardino RCIS) to test the processes and mechanisms, and secure early successes.