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A Review of Lessons Learned through the RAMP Working Group, Addendum to the Draft Statewide Framework

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**A Review of Lessons Learned through the RAMP Working Group, an  
Addendum to the Draft Statewide Framework**

Prepared for California Department of Transportation

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Photo Credit: Patrick Huber

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<b>GLOSSARY .....</b>	<b>3</b>
<b>INTRODUCTION .....</b>	<b>4</b>
CAVEATS .....	5
<b>RAMP STRUCTURE AND FUNDING .....</b>	<b>6</b>
MITIGATION HIERARCHY .....	6
FUNDING MECHANISMS.....	9
<i>General Comments</i> .....	9
<i>Revolving Funds</i> .....	10
<i>Sales Tax Measures</i> .....	10
<b>TECHNICAL METHODS - ESTIMATING MITIGATION DEMAND.....</b>	<b>11</b>
ESTIMATING TRANSPORTATION PROJECT FOOTPRINTS .....	11
ASSESSING IMPACTS ON SPECIAL-STATUS SPECIES AND THEIR HABITATS .....	12
<i>Listed Species and Suitable Habitat Types</i> .....	12
<i>Susceptible Land cover</i> .....	13
METHODS ASSESSMENT .....	15
<i>Overall</i> .....	18
<b>LEGAL, PLANNING AND POLICY FRAMEWORK .....</b>	<b>23</b>
IMPROVING EFFECTIVENESS AND EFFICIENCY .....	23
<i>Standardized Nomenclature</i> .....	23
<i>Improving Communication</i> .....	24
<i>Scoping Tools</i> .....	26
PARTICIPATING AGENCIES’ RECOMMENDATIONS AND OBSERVATIONS.....	28
<i>RAMP Structure and Funding</i> .....	28
<i>Communications</i> .....	29
<i>Technical</i> .....	30
<b>SOURCES.....</b>	<b>32</b>
<b>APPENDIX A AGENCY PROFILES.....</b>	<b>34</b>
FEDERAL HIGHWAY ADMINISTRATION .....	34
UNITED STATES ARMY CORPS OF ENGINEERS .....	36
UNITED STATES FISH AND WILDLIFE SERVICE.....	38
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY .....	40
CALIFORNIA DEPARTMENT OF FISH AND WILDLIFE.....	42
STATE WATER RESOURCES CONTROL BOARD .....	44
STRATEGIC GROWTH COUNCIL .....	47
<b>APPENDIX B STANDARD OPERATION PROCEDURE (SOP) FOR DETERMINATION OF MITIGATION RATIOS .....</b>	<b>49</b>
<b>APPENDIX C 2008 FINAL RULE ON COMPENSATORY MITIGATION FOR LOSSES OF AQUATIC RESOURCES.....</b>	<b>50</b>

## **GLOSSARY**

The following abbreviations are used:

CEQA – California Environmental Quality Act

CNDDDB – California Natural Diversity Database

CDFW – California Department of Fish and Wildlife

CRAM – California Rapid Assessment Method

CTC – California Transportation Commission

CWHR – California Wildlife Habitat Relationships

DWR – California Department of Water Resources

ECOS – Environmental Conservation Online System

EPA – Federal Environmental Protection Agency

ESA – Endangered Species Act

FHWA – Federal Highway Administration

GIS – Geographic Information System

HCP – Habitat Conservation Plan

NCCCP – Natural Community Conservation Plan

NEPA – National Environmental Policy Act

NFWF - National Fish and Wildlife Foundation

NHD – National Hydrography Dataset

RAMP – Regional Advance Mitigation Planning

SGC – Strategic Growth Council

SHOPP – State Highway Operation and Protection Program

SHRP 2 – Strategic Highway Research Program

SOP – Standard Operation Procedure

STIP – State Transportation Improvement Program

SWRCB – State Water Resources Control Board

TNC – The Nature Conservancy

USFWS – U.S. Fish and Wildlife Service

USACE – U.S. Army Corps of Engineers

## INTRODUCTION

This document is a review of insights and lessons learned in the years since the RAMP working group developed its Draft Statewide Framework (AECOM 2012). It has been developed by the University of California, Davis (UCD), and is intended primarily to supply additional perspective to Caltrans, through a synthesis of information gathered during an impact analysis for a pilot project, from a series of interviews with agency personnel, from a project developed for the Transportation Research Board by UCD, and from ongoing discussions in RAMP's multi-agency working group.

The Draft Statewide Framework can be used as a benchmark from which progress in advancing regional planning principals into the ongoing maintenance and development of California's infrastructure, particularly its transportation networks, can be measured. Since the posting of the Draft Statewide Framework to the RAMP working group website, subsequent activities by working group members have included the issuance of state contracts for compensatory mitigation sites, impact studies, legislative initiatives and analyses, and ongoing discussions within and among the various agencies involved. Observations in this report are derived from that progress as well as interviews with personnel from a wide range of state and federal agencies, from a technical review of the methods used, and from other ongoing efforts such as the federal SHRP 2 program.

The report contains three sections:

First, the structure and funding prospects for RAMP are examined. These issues represent some of the most difficult hurdles to implementing RAMP, as the current structure of funding and infrastructure project timelines are limiting factors to both bundling multiple projects' mitigation needs and establishing mitigation in advance of the transportation project programming. The mitigation hierarchy and the advantages and drawbacks of employing different mitigation approaches is discussed, followed by an overview of potential funding options for a RAMP. This section most closely corresponds to the Statewide Implementation chapter in the Draft Statewide Framework (AECOM 2012).

Second, from a technical standpoint, there have been lessons learned related to performing an impact assessment, including the datasets needed, geoprocessing techniques and appropriate buffer distances for transportation projects. These are discussed in the Technical Methods - Estimating Mitigation Demand section. Additionally, an assessment on the methods used in the impact report of this project was done using two planned transportation projects in the Sacramento Valley that had mitigation requirements fulfilled during the time frame of this project. We were able to compare our estimated results with the final mitigation amounts determined by Caltrans and the regulatory agencies. That comparison is also described in the Technical section of the document. Following the methods assessment is a discussion on standardizing nomenclature as an overall recommendation, and specific areas where standardization could be easily utilized. This is followed by a consideration of environmental scans in general and an overview of different online scoping tools available at the state and federal level. This section coincides with the Establishment and Use of Regional Assessment Areas chapter in the Draft Statewide Framework.

Third, is the Legal, Planning and Policy Framework section, areas of improving effectiveness and efficiency are explored, including standardizing language, communications, both within agencies and between Caltrans and outside agencies, and the use of scoping tools. Three areas where improvements can be made regarding communications are discussed: between divisions within agencies; between the headquarters staff that comprise the Work Group and regional district staff; and within headquarters, between staff to the upper management decision makers. This section also includes Participating Agencies' Recommendations and Observations. These recommendations are organized into three main points: RAMP structure and funding, communications, and technical. This section most closely resembles the Legal, Planning and Policy Framework section in the Draft Statewide Framework.

### **Caveats**

The observations herein are intended to be informative for Caltrans, and to provide some context useful to personnel within the agency to continue the development of advance mitigation planning. However, the observations presented do not represent the official policies of Caltrans, the State of California or the Federal Highway Administration. The contents of the report are the interpretation of the state of RAMP as of early 2015 by the UCD authors, who are responsible for the facts and accuracy presented herein. This report does not constitute a standard, specification, or regulation.

## **RAMP STRUCTURE AND FUNDING**

Regulatory and infrastructure agencies have somewhat different yet overlapping views on how compensatory mitigation should be dealt with, and there is general support for the concept of integrating a regional approach into the mitigation process. Additionally, some federal guidelines stipulate directly how certain types of mitigation should be undertaken, such as using a watershed approach in the case of wetland impacts. This section of the report addresses some perspectives on the different pathways that mitigation takes and their implications for RAMP, and funding mechanisms that may help to support a RAMP are also described.

### **Mitigation Hierarchy**

The ‘Mitigation hierarchy’ refers to the order in which mitigation is required to be handled by infrastructure agencies, and which is outlined in the April 10, 2008, *Compensatory Mitigation for Losses of Aquatic Resources*, final rule issued by USACE and EPA, and in CEQA (Appendix C). The first two required steps for dealing with environmental impacts from infrastructure projects were acknowledged by nearly all agencies that were interviewed for this project: avoid and minimize. There is some concern that RAMP guidelines do not clearly state these two steps as part of the process, because they are the most important actions that can be taken to enhance habitat conservation, and because the RAMP approach is designed to assess the potential unavoidable impacts from projects for the purpose of acquiring compensatory mitigation. This also points to a need by Caltrans for assurances from regulatory agencies that if compensatory mitigation is acquired through the RAMP process in excess of what is eventually needed, that the additional credits could be used at a later date.

Further discussion with the different agencies also revealed that Habitat Conservation Plans (HCPs), Natural Community Conservation Planning (NCCPs), endangered species recovery plans, Greenprints, landscape connectivity maps, and other regional conservation assessments can be useful tools in identifying areas that should be avoided or impacts minimized for transportation projects. The assessment of potential impacts by using such information could permit examination of alternate alignments for road projects, to avoid the environmentally sensitive areas, given that the RAMP scoping process can be pushed far enough ahead of respective projects to be considered in the design phase.

Once avoidance and minimization have occurred and if compensatory mitigation is needed, there are a number of considerations that need to be weighed in order for permitting agencies to decide how, where and how much compensatory mitigation is needed. Such compensatory mitigation needs to be managed in perpetuity. The first two options for compensatory mitigation are mitigation banks and in-lieu fee programs. These have benefits and disadvantages that make each of them more suitable depending on the circumstances, described below. A third option, permittee-responsible mitigation, which requires that Caltrans develop its own compensatory mitigation sites, is generally thought to be a last resort, if other options are not available. Caltrans is currently not well situated to operate such facilities for the long term, and there is general

consensus among infrastructure and regulatory agencies that this is a less desirable pathway than the other two.

Mitigation banks are third party entities that for a fee take on much of the responsibility of providing a comparable habitat conservation area to compensate for the environmental impacts of a project. By purchasing bank credits to offset impacts, the need for Caltrans to establish an approved mitigation site and monitor the area in perpetuity is no longer needed as part of the transportation project's planning, which can greatly reduce permit processing time, allowing for more expedient delivery of the transportation project. The purchase of such credits includes the cost of an endowment for management in perpetuity. Drawbacks include the possibility that there may not be a mitigation bank with the appropriate credits within the area of the project, necessitating the creation of such.

In-lieu fee programs are another type of third party mitigation that can be used where there is an approved in-lieu fee program in place. Formal programs or agreements are established with the U.S. Army Corps of Engineers (USACE) in consultation with other agencies. They operate similarly to mitigation banks except for the requirement of banks to have advance development. In-lieu fee programs, on the other hand, usually initiate mitigation projects after collecting fees, resulting in considerable lag time between permitted impacts and the establishment of compensatory mitigation projects. However, if seed money is used to fund projects, compensatory mitigation could be completed before the impacts occur, thereby reducing or eliminating temporal loss. Prior to the 2008 Mitigation Rule, in-lieu fee programs were not required to provide the same financial assurances to ensure long-term mitigation success as mitigation banks. Therefore there is greater uncertainty associated with in-lieu fee programs versus mitigation bank credits, regarding the implementation of mitigation projects (EPA, 2008). The 2008 Mitigation Rule, however, now holds in-lieu fee programs to same performance standards as mitigation banks and requires the same financial assurances.

However, in-lieu fee programs are sometimes a more practical solution than mitigation banks for example where mitigation options are limited because there are not enough mitigation banks, or credits available. For example, one of the objectives of the Sacramento District In-lieu Fee Program is to provide mitigation alternatives “in areas underserved by mitigation banks or where the Sacramento District determines that the available mitigation bank credits are not applicable to the impacts to be mitigated” (<http://www.nfwf.org/ilf/Pages/home.aspx>; NFWF, 2012). The 2008 Final Rule did, however, specify that in-lieu fee programs must follow the same process as that for mitigation banks, including going through the interagency review team process.

The recent Sacramento District California In-Lieu Fee Program, was developed by the National Fish and Wildlife Foundation (NFWF) and approved in 2014 in compliance with the 2008 Final Rule and approved for use by the USACE Sacramento District, EPA, National Marine Fisheries Service, SWRCB, the Central Valley Regional Water Quality Control Board and the Lahontan Regional Water Quality Control Board. The program makes credits available to satisfy



compensatory mitigation needs for permittees for impacts to aquatic resources. The types of credits in this program are for: vernal pool credits, aquatic resource credits for impacts to wetlands, other waters of the U.S. and California, and to aquatic species in 17 areas that are based on individual river systems.

Permittee-responsible mitigation is used when mitigation bank credits or in-lieu fee programs are unavailable, or cannot be created within the timeframe of projects through a request for proposal (RFP) process, although generally the RFP process moves faster than permittee-responsible mitigation. The latter approach has been attempted by California Department of Water Resources. There are also circumstances in which permittee-responsible compensatory mitigation may be the most appropriate option, based on watershed needs, aquatic resources, or other reasons. However, there may be increased risk and uncertainty, temporal loss, or other drawbacks associated with this approach. The low priority is due to a number of drawbacks to purchasing land for mitigation needs. First, identifying suitable areas and willing sellers can be time consuming. The purchase of land through Department of General Services is highly regulated. Once in state ownership, the state is also liable if anyone should be on the property and be injured. The property will also likely need additional work to create, restore or enhance the land in order for it to be considered admitted as mitigation. The land purchase process itself can take much longer to complete than buying credits or in-lieu fees, slowing down the timeline considerably. Additionally, the permittee must also set up endowment funding for long-term management, monitoring, and reporting, requiring additional time.

There are some potential benefits, however, to directly purchasing land for mitigation purposes. For example, there could be benefits as to the location of the mitigation site to be purchased, if there is an opportunity, for example, to purchase a highly prized area deemed a priority by multiple agencies via a greenprint, HCP or NCCP. These considerations are not necessarily taken into account in the siting of typical mitigation banks.

There are some risks for Caltrans in purchasing land. There is a risk that the needed credits are only on properties with more land than needs to be purchased, which could lead to acquisition of larger parcels that could not be credited as mitigation in later times. The ability to evaluate the potential credits on any given parcel of land would possibly reduce this risk

The location of compensatory mitigation is another important aspect that requires consensus among different agencies and regulators. As mentioned above, the 2008 Final Rule on Compensatory Mitigation for Losses of Aquatic Resources suggests that compensatory mitigation for impacts to wetlands should be completed within the same watershed as the project with the impact. This view of mitigation fits well within the regional goals of RAMP, and can be incorporated into mitigation portfolio modeling. However, there are logistical difficulties that could arise when attempting to execute advance mitigation across jurisdictional boundaries. For example, funding mitigation across county boundaries or between multiple Caltrans districts could prove difficult. And while establishing a NCCP or setting up mitigation for multiple

projects within a county is still beneficial and more regional than the current project-by-project system, habitat conservation at an even larger scale could be more valuable.

Another debate within some agencies has been the potential tradeoff of proximity to impact vs. ecological benefit in the establishment of mitigation projects. Often the areas just outside of where transportation projects are occurring are located in urban areas, which might have lower conservation priorities than more rural or transitional areas where projects are not occurring. There is discussion of whether quality of mitigation should trump distance from the site where impacts are occurring. However, current wetland regulations call for mitigation to generally occur within the same watershed as the impacts requiring mitigation.

## **Funding Mechanisms**

One of Caltrans' most challenging obstacles to furthering advance mitigation as a programmatic effort is a lack of sustainable funding sources that can be used outside of transportation project funds and that could be made available in advance of the transportation project for planning or for capital costs. While other models of financing advance mitigation can be examined for a potential fit with Caltrans' existing procedures, there are internal structures that make borrowing another agency's or state's financial mechanism a difficult task. There are, however, some suggestions for finding a funding source for advance mitigation on the part of California agency employees who work closely with RAMP that are reported below for consideration in the 'general comments section'. In addition there are two other broad categories: revolving funds and sales tax measures. Note that the majority of agency comments are in the third chapter of this report, but that we include some general comments here, when they relate to funding mechanisms.

## **General Comments**

One suggestion was to mandate a percentage of all project funding be spent on compensatory mitigation. This would allow funds to be available to purchase mitigation credits before transportation projects have been programmed.

Another option suggested by California Department of Fish and Wildlife (CDFW) would be to have state-sponsored in-lieu fee programs akin to North Carolina's Ecology and Enhancement Program (EEP) or Florida's Department of Transportation's in-lieu fee program. Similar to the Sacramento District California In-lieu Fee Program (<http://www.nfwf.org/ilf/Pages/home.aspx>), this option would allow for the implementation of mitigation associated with regional planning as well as meet the needs in areas where mitigation options are more limited.

Agencies that have purchased land for mitigation needs for one project often carry excess land beyond what was necessary for that project. In those cases, it can be difficult to use the land for additional projects in a timely manner, or the costs for maintaining the land could be significant.

A suggestion was to allow agencies to sell additional credits or land they own on an open market, internally within their agency for other projects' mitigation, or to mitigation banks should their funding source for the purchase allow reimbursement. Current regulations allow for the "sale" of credits to Caltrans districts; a wider market would require legislative change.

Last a cautionary comment was, there should be careful consideration about linking a RAMP to an expiring funding source. Many General Obligations bond measures have expiration dates and bonds cannot be sold after a set date that the voters approve (by a statewide ballot).

## Revolving Funds

Environmental revolving accounts have been established by other State DOTs (Washington and North Carolina are two examples) as a way to provide a funding source for advance mitigation that rests outside of the transportation project and thus is not as bound by the project timeline. In the case of Washington DOT, the environmental revolving account, called Advanced Environmental Mitigation Revolving account or AEMRA, had initial seed money for the state's motor fuel account. Loans could be made from the account to pay for advance mitigation projects and then repaid using the transportation project funding at a later time when those funds could be released (Sciara, 2015).

For North Carolina, the funding component and compensatory mitigation approach are part of a larger Ecosystem Enhancement Program (EEP) which was created to programmatize environmental mitigation for the North Carolina Department of Transportation. The program has been revised and expanded over time to include 4 ILF programs. The Ecosystem Restoration Fund acts as a revolving fund in that funds can be drawn from two accounts – one for transportation-related projects and one for all other parties – to pay for compensatory mitigation and then the entity using the funds will be billed by the EEP on a quarterly basis. Funds are transferred to the Ecosystem Restoration Fund based on a 7-year estimate of mitigation needs (Sciara, 2015). There is also a dedicated in-lieu fee program for the state which manages mitigation fulfillment, which is detailed in the In-Lieu Fee Program section (<http://portal.ncdenr.org/web/eep/in-lieu-fee-programs>).

## Sales Tax Measures

Another method of funding mitigation in advance of a programmed transportation project is through a dedicated fund set up through a local tax measure. Two California counties, Orange County and San Diego County, have secured funds for the mitigation needs of multiple projects through sales tax measures.

The Environmental Mitigation Program in Orange County was established in 2006 when voters in that county approved Measure M, which secured funds for the acquisition, restoration and management of lands to mitigate for 13 freeway projects in the county described within an

existing HCP. This effort included using conservation priorities already identified during the HCP planning process.

The TransNet Transportation Investment Plan was sponsored by SANDAG and approved by San Diego voters in 2014. This sales tax measure has allocated \$850 million of the total \$14 billion for advance mitigation, to support acquisition, restoration and management for 11 major transportation projects under an HCP plus funding for local agencies to mitigate local projects (Sciara, 2015).

These programs depend largely on effective communication between collaborating entities and have also benefitted from sharing information with other jurisdictions. Because both plans are relatively new, there is little information of the long term benefits, shortcomings or other outcomes of the programs. However, these programs in general have allowed these counties to satisfy the mitigation requirements of infrastructure projects at lower costs and in advance of project impacts, while also providing for the restoration and preservation of larger parcels of land with greater habitat integrity.

## **TECHNICAL METHODS - ESTIMATING MITIGATION DEMAND**

Some needs for refinement of technical methods regarding RAMP have been identified. During the environmental impacts assessment on the pilot region of this project, some specific suggestions as well as areas of caution were noted. These are divided into two categories: transportation project estimates and impacts to species, habitat, and aquatic resources. This section also includes the methods assessment, which is a comparison of our methods and estimates with actual mitigation needs required for two transportation projects in the pilot area.

### **Estimating Transportation Project Footprints**

A critical first step in estimating project impacts is using an appropriate buffer of the existing roadway to adequately capture the area likely to be affected by the construction process. The buffer represents the distances from the edge of existing infrastructure that the new project will occupy (or if all work will remain within the existing footprint, then it is zero). A reference table used for the pilot regional impact assessment is the result of several iterative collaborations between Caltrans staff and UCD researchers in an effort to derive accurate buffer distances for a wide range of project types that Caltrans develops. Despite the work that has taken place in arriving at these distances, more work remains in order to assess the accuracy of these numbers, and to ensure that all types of construction deployed by Caltrans are represented in the reference table.

A further consideration for RAMP projects being undertaken in other regions (i.e. outside the pilot project area in the Central Valley) is to revisit this table in light of the differences in geology, geomorphology, etc. between California's heterogeneous regions. For example, adding a lane in the steep and geologically unstable Coast Ranges could result in a larger project footprint than a similar project in the flat Central Valley, particularly when cut and fill is required, which is not an activity we noted in the pilot area. Documentation from previous

projects could prove helpful in this regard, and Caltrans' reference manual, the Highway Design Manual (<http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.htm>) may also provide useful guidance.

Another systematic improvement to conducting regional impact assessments would be the availability of a good road dataset in GIS to use as a starting point. The RAMP methods require using delineation of roads to conduct the impact analyses. This frequently requires analysts to make lines that represent the roads from post mile dots available within Caltrans as georeferenced points, in order to make 2-dimensional portrayals of roads, and then calculate the footprints of additional construction. If the linear features of Caltrans' network were already in a highly accurate GIS format, then there could be significant value and time savings during data preparation for RAMP analysis that supports the impact assessment. For example, road data would be more easily translatable to buffered areas if line data consistently matched the centerline for two-lane roads and were separated for roads with large medians between lanes flowing in opposite directions. Likewise, while bridge data exist for California in the form of points, it would be easier to create buffered areas if those were represented as line segments. It is possible that these datasets are already available to Caltrans staff (however we did not encounter the source for these data) or could be easily developed.

### **Assessing Impacts on Special-Status Species and Their Habitats**

The projection of regional mitigation needs in a RAMP process requires reasonably accurate models of listed-species (and other special-status species) habitat as well as the locations of habitats and vegetation/habitat types that typically require mitigation when impacted. The approach outlined in the associated "2015 Mitigation Needs Assessment for Transportation Projects for the Sacramento Valley Pilot Project for Regional Advance Mitigation Planning" ("Impacts Assessment") and "A Reference Manual for Caltrans Staff on Regional Advance Mitigation Impact Assessment Methods" ("Guidance Manual"), as well as this report, was developed through several years. Methods reported in those documents, to use biological data were developed at the statewide level and in several regional-scale projects (Thorne et al. 2009, Huber et al. 2009, Thorne et al. 2014). However, there are still improvements to be made in the RAMP methodology that could increase the accuracy of predicted impacts.

### **Listed Species and Suitable Habitat Types**

Selecting the list of species and habitats to assess is a relatively straight-forward exercise with a few exceptions. Federal and state listed species should be included, as well as open water, wetlands, riparian forest, and oak woodlands land cover types. In addition to these resources (which should be assessed in all RAMP projects), some species should be added to the list that are not formally listed. These are typically candidate or other special status species. Caltrans biologists should coordinate with regional CDFW staff to determine the full list of species and habitats to be included in the analysis.

Once the analysis species and habitats are identified, CWHR is generally a useful resource for selecting appropriate land cover types to be treated as potential habitat. While the current methodology calls for the selection of land cover types that have a "High" rating in any of the size or stage classes in CWHR, CDFW staff should be consulted to determine if there are other land cover classes that should be added to the set.

The species-specific impacts rely on CNDDDB data. While this dataset is a valuable statewide repository of known occurrence data, it is not a comprehensive list of all species' locations. However, it is the best available data on a statewide scale. There are gaps in coverage, especially for those species with large ranges or are highly mobile. Perhaps more general range models should be used for these species, such as those found in the CWHR database.

Another area of uncertainty in the current RAMP methods lies in the use of 2- and 4-mile buffers around CNDDDB points used to identify likely occupied habitat. It is currently an open question whether or not these are reasonable distances to use for the purpose of modeling anticipated impacts. More work needs to be undertaken in ground-truthing these assumed buffer distances, as is illustrated in the analysis in the Methods Assessment (below).

## Susceptible Land cover

### *Wetlands*

Wetlands often are a problematic resource to analyze for identification of potential impacts. Regulatory agencies have strict definitions of the hydrologic and ecological characteristics for the delineation of wetlands; however typical land cover datasets are not created using these same parameters. Further, the spatial scale of wetland occurrence does not always lend itself to regional evaluation; wetlands can be much smaller than typical minimum mapping units in geospatial datasets and thus may not be identified in impact assessments such as those described here for the RAMP process. Further research is warranted concerning potential discrepancies between modeled impacts and measured impacts.

### *Waters of the U.S. and State of California*

Waters of the U.S. and the State of California have been identified using land cover datasets in RAMP analyses. However, many of these aquatic features are small and could potentially be missed if a dataset's minimum mapping unit is larger than the surface area of the water feature.

### *Riparian*

Riparian forests are another general landcover type that requires mitigation for impacts under California law. This is often a relatively straight-forward ecological community and is likely to be able to be identified using landcover data, especially of a fine-scale nature.

### *Oak Woodlands*

Oak woodlands generally are better delineated in land cover data than are several other classes such as wetlands. However, there are some areas of ambiguity. First, there are questions concerning the gradation from oak to grassland and how the classification into these land cover types might affect the impact estimation. Second, oaks often are a component of riparian forests; it is unclear in these instances whether impacts will be considered to be to oak woodlands or to riparian forests by regulatory agencies.

### *Vernal Pools*

Vernal pools are not specifically mentioned in state or federal law, but they generally fall into the category of wetlands. In addition, many vernal pool complexes in California contain state- and/or

federally-listed plant or animal species, so mitigation for impacts is required under ESA/CESA. These ecological features are generally very fine-scale and thus are often not included in land cover datasets. However, general vernal pool complexes often do appear in land cover datasets, so combinations of these polygons and land cover data can be used to potentially effectively delineate pools and their connected uplands.

### *Farmland*

Farmland is not a biological resource, however in some situations mitigation may be required for impacts from transportation projects. Regulations in California's coastal zone prioritize conservation of farmland, but beyond this area, efforts should be made to determine the necessity of assessing farmland impacts in a RAMP process. Most of the farmland preservation needs would be found through local planning documents, like a General Plan.

### *Stream Crossings*

The original approach developed for the RAMP analysis for assessing impacts to streams was to catalog the number of waterway crossings by transportation projects. This method produces an inventory of crossings, it does not account for either the size of the waterway or the area of impact specific to project types. Therefore an area of impact analysis has been added to the RAMP analysis methodology. This enables impacts to be calculated in a similar fashion to those associated with special-status species and their habitats. Calculation of stream area impacts is a relatively recent advance in systematic impacts modeling, and further testing is needed to validate the approach.

For stream area calculations, waterway width is systematically determined by stream order. While this serves as a moderately successful modeling strategy, there are several aspects that should be addressed in future analyses to improve accuracy. First, stream order information used in the Impacts Assessment, and that is generally available, is from the NHDPlus dataset, a national hydrographic dataset ([http://www.horizon-systems.com/nhdplus/NHDPlusV2\\_home.php](http://www.horizon-systems.com/nhdplus/NHDPlusV2_home.php)). Not all waterways in NHD are featured in NHDPlus, especially small or ephemeral streams. Additional effort should be used to either find other data to fill in the stream order gaps or methods should be developed to account for these aquatic features. Second, while average waterway widths by stream order can be approximated, there is typically considerable variation in the widths of streams. More effort should be undertaken to determine if there are other stream characteristics that could be used to refine the stream order-based data. Finally, the stream widths derived in the Impacts Assessment are specific to the northern portion of the Sacramento Valley; other regions may very well have different average widths.

### *Salmonid Fish Impacts*

Locations of salmonid impacts are relatively straight-forward to estimate. However, mitigation associated with these impacts is generally not area-based but rather based on the number of individual fish affected. While this is very difficult to model at the broad spatial scales of a RAMP assessment, a simple count of the number of intersections between projects and salmonid habitat results in an impact assessment usable for identifying mitigation strategies. As long as up-to-date distribution data are used, this approach should be adequate for the RAMP process.

## Methods Assessment

One of the major outstanding questions associated with RAMP work to date concerns the accuracy of the impact assessments and whether the methods developed will adequately identify the impacts as measured by field biologists. If the methods successfully reproduce field-based measurements, or if they differ in readily understandable ways, they can be used with a degree of certainty in impact assessment. However, they will need to be modified if they do not perform with consistency.

In order to begin assessing the accuracy of the methods in the RAMP pilot area, we compared modeled impacts with those measured in the field by Caltrans biologists (Table 1). We selected projects that had previously been modeled in the regional assessment as well as had already been subjected to environmental review. Two projects met these requirements. This small sample size does not allow for rigorous methods testing; however these projects do begin to shed light on strengths and shortcomings of the current RAMP methods detailed in the Impacts Assessment.

The two projects analyzed were:

- EA 03-0F690 (Flag Canyon Bridge)
- EA 03-36690 (Rio Bonito Project)

EA 03-0F690 is a bridge replacement project in Butte County (Figure 2). EA 03-36690 is 4.6 mile long shoulder widening project, also in Butte County (Figures 3 and 4; Table 1).

### *Wetlands*

Estimated impacts using regional GIS data missed the wetlands that were found at both project sites. Neither project site overlapped NWI-identified wetlands. Wetlands identified at EA 03-0F690 were likely classified as part of the riparian forest ecosystem in the VegCAMP land cover dataset, while those at EA 03-36690 were likely part of a vernal pool grasslands complex. This situation is currently a difficult one to address. Characteristics used to define wetlands for mapping purposes can vary between mapping efforts. Without a wetlands spatial dataset based on a regulatory definition, it is likely that wetlands will be underreported in RAMP impact assessments using the current methods. Additionally, further work with land cover maps by RAMP analysts could permit identification of land cover types that should be counted as wetlands for the purposes of a RAMP assessment, but which were not labeled as such by the vegetation mappers.

### *Waters of the U.S. and State of California*

The modeling approach indicated approximately three times as much open water to be impacted in EA 03-0F690 than did the field-based method. Aerial imagery indicated relatively high accuracy in identifying waters using the stream order-based buffer. Therefore, the discrepancy is likely due to a larger modeled project footprint than was actually impacted during project construction. The footprint model developed for the RAMP pilot project includes buffers of 100 feet for bridge construction (Figure 1). The actual footprint is likely less than this area. In EA 03-



36690 there is only a very minor discrepancy between the two approaches with the measured impact being 0.03 acres while the modeled impacts did not find any area of overlap. Minimum mapping units of most land cover datasets will likely not pick up impacts of this scale. Avoidance and minimization measures could also have contributed to the discrepancy.

### *Riparian*

As in the Waters of the U.S. (above), the modeling approach indicated approximately three times as much riparian habitat to be impacted in EA 03-0F690 than did the field-based method. Aerial imagery indicated relatively high accuracy in identifying riparian habitat using the stream order-based buffer. Therefore, the discrepancy is likely due to a larger modeled project footprint than was actually impacted during project construction. The footprint model developed for the RAMP pilot project includes buffers of 100 feet for bridge construction. The actual impact was likely substantially less than this area.

### *Vernal pools*

A major discrepancy was found between measured and modeled impacts to vernal pool complexes in EA 03-36690 (5.32 acres measured compared to 0.0 modeled). This is of concern because vernal pools are among the most sensitive California habitats, are frequently associated with listed species, and there are a limited number of vernal pools that might be used for mitigation. There are several possible reasons for the discrepancy between the field-measurements and the RAMP projections. First, the modeling approach selects typical vernal pool-associated land cover types from within polygons identified as vernal pool complexes. In this case, the overlap between the project footprint and the vernal pool and land cover type GIS polygons contained land cover polygons classified as “Urban” and “Agriculture”. Field measurements identified these areas as vernal pool impacts. However, even if these areas were classified as vernal pool impacts in the modeling, they only totaled 0.63 acres. Therefore, it appears likely that the 15 foot buffer associated with shoulder widening projects in the modeling approach was not sufficient in this case to capture the full extent of impacts (Figures 2 and 3). Additional buffers may be needed to fully capture the various effects associated with construction activities. Field measurements of temporary impacts were twice those of direct impacts; these temporary impacts are likely harder to capture with the current buffers used to estimate project footprints than are direct impacts. In addition, some vernal pools are difficult to map using imagery because they are shallow and can appear to be no more than undulations in the landscape. Most regional GIS data, including the Holland statewide vernal pool GIS layer, which is considered the most authoritative source available, do not include these types of features.

No vernal pool impacts were modeled or measured in EA 03-0F690.

### *Farmland*

Farmland impacts were identified in both modeled and measured assessments in EA 03-36690. The estimates in both methods were nearly identical. At first glance, this suggests that the estimated project footprint and land cover data were accurate. However, given the uncertainty about the buffer distance assigned to this project (see vernal pools above), a different explanation is suggested. Aerial imagery reveals that one parcel classified as “Agriculture” in the land cover

dataset, in fact appears to be a restoration site of some sort. This parcel is the vernal pool polygon described above. Therefore, it is likely that the buffer used to estimate the project footprint is too narrow, but in this case accuracy issues were offset by counting the restoration site as farmland. This then points to two future needs in the current RAMP methodology: 1) up-to-date land cover data (difficult, as this is a continually changing target); and b) further refinement of project buffers or the determination of additional buffers by project type and biological resource potentially affected.

#### *Giant garter snake*

There was a field-measured impact of 46.22 acres to giant garter snake (GGS) habitat in EA 03-36690, the majority of which were temporary (32.99 acres), and no impacts to GGS in the other project. The modeled impacts (14.22-14.38 acres) were very similar to the measured direct impacts; however the model did not capture the temporary impacts well. This suggests that while the 15 foot buffer associated with shoulder widening may be relatively accurate in terms of new permanent disturbed area, it does not capture the land required to stage the construction project which could then be restored after project completion. While this temporary area may not require as much mitigation as permanently impacted areas, it should in the future be taken into consideration when estimating project impacts. Currently temporary impacts are not included in the RAMP impact assessment methods.

#### *Swainson's hawk*

Estimated impacts to Swainson's hawk habitat were the least accurate modeling results. EA 03-36690 had 20.97 acres of measured impacts to hawk habitat, but the models did not estimate any impacts. The reason for this was the lack of recent CNDDDB records for the hawk in the vicinity of the project. Using a CNDDDB-based approach for habitat modeling for wide ranging species such as Swainson's hawk is likely to result in issues such as this. Systematic and comprehensive habitat modeling throughout the species' range would likely result in much better impact estimates. However, these models are resource- and time-intensive to develop. Instead of relying on the development of new habitat models in RAMP efforts, perhaps treating all appropriate land cover types within a planning area as potential habitat might be the preferred method of addressing this issue.

No field-measured or modeled impacts were associated with EA 03-0F690.

#### *Tricolored blackbird*

The RAMP model estimated 0.31 acres of impacts to tricolored blackbird habitat in EA 03-0F690 while none were measured in the field. It is unclear whether the discrepancy lies with an overestimation of blackbird habitat by the model or a lack of recognition of habitat by biologists due to distance from an existing blackbird colony. This suggests further investigation of local habitat use by the species may be warranted.

No field-measured or modeled impacts were associated with EA 03-36690.

## Overall

There were several instances of modeled impacts closely paralleling measured impacts. However, there were several improvements to current RAMP methods that could bolster the accuracy of the modeled assessments in advance of road projects:

- Further investigation of the extent of impacts associated with specific project types or specific biological resources. The buffer distances used in the RAMP pilot should be better refined. This is likely to be especially true when RAMP is used in new regions.
- Indirect and temporary impact estimations need further refinement.
- Wide-ranging species that can use a variety of habitat types may need to be modeled differently than those with limited ranges or those with higher site fidelity.
- Vernal pool modeling should be modified to include the full polygons provided in available GIS datasets rather than refined by land cover type.
- Improved wetlands, crop type, and general land cover datasets should be incorporated in RAMP projects as they become available.
- More comparisons should be made when possible between modeled and measured impacts. This will help increase the accuracy of RAMP methods.

The accuracy assessment conducted here is the first of its kind, and additional comparisons will likely greatly improve the performance of RAMP assessments. There is ongoing discussion within Caltrans about the need to balance impact projections. A major concern has been that an assessment that identifies more impacts than actually occur, which could expose Caltrans to overspending on environmental credits. For example, 38 projects were identified in this region, but only 18 of those required permits. A systematic GIS approach to impacts projections may thus lead to an overestimate of mitigation need.

However, the accuracy assessment presented here indicates that the opposite may be true, and that efforts within the RAMP methods to constrain impacts can lead to under-estimations. Under-estimations of the extent of impact are much more detrimental to Caltrans' mitigation process, as it could result in the need for more mitigation than planned for. We recommend conducting accuracy assessments on a series of completed or ongoing projects from each Caltrans district, to calibrate the RAMP models locally, to develop better confidence in the outputs, and to promote the methods among Caltrans staff.

Project 03-0F690 - Flag Canyon Bridge



Figure 1. Estimated project footprint and some of the potential impacts.



Project 03-36690 - Rio Bonito Project



Figure 3. Close up of vernal pool complex and estimated project footprint.

**Table 1.** A comparison of measured impacts associated with completed road projects and the estimates derived from the methods detailed in the Impacts Assessment. “Perm” refers to permanent impacts, and “Temp” refers to temporary impacts. “Estimated” are the modeled impacts from the RAMP assessment document. All numbers are in acres. Cells lacking numbers should be read as “0.0”; these were excluded from the table for clarity.

Resource	EA 03-0F690 (Flag Canyon Bridge)					EA 03-36690 (Rio Bonito Project)						
	Direct (ac)		Indirect		Total	RAMP Estimated	Direct		Indirect		Total	RAMP Estimated
	Perm	Temp	Perm	Temp			Perm	Temp	Perm	Temp		
Wetlands	0.10				0.10		0.49	0.82			1.31	
Waters of the U.S./ CA State		0.11			0.11	0.30						0.03
Riparian		0.12			0.12	0.32						
Vernal pools							1.79		3.53		5.32	
Farmland							14.16				14.16	14.35
Giant garter snake							13.23	32.99			46.22	14.22-14.38
Swainson's hawk							6.89	14.08			20.97	
Tricolored blackbird						0.31						

## **LEGAL, PLANNING AND POLICY FRAMEWORK**

One of the goals of implementing a RAMP effort is to streamline the process of fulfilling mitigation obligations from transportation projects. From completing the initial impact assessment on the pilot area, we encountered several areas where improvements could be made. These are discussed in the following section, Improving Effectiveness and Efficiency. In addition, comments from outside agencies were compiled and organized by subject in Participating Agencies' Recommendations and Observations, with the complete profiles for each agency in Appendix A.

### **Improving Effectiveness and Efficiency**

There were some observations made during the process of the impact assessment of the pilot region that could improve the effectiveness and efficiency of this practice, especially standardizing language, improving communication and implementing web-based environmental scoping tools.

#### **Standardized Nomenclature**

The mitigation required for a transportation project is guided by many different factors related to the project: specific location, degree of avoidance and minimization accomplished, surrounding environment, slope, conditions of the existing road and roadbed are just a few examples. However, for the purposes of creating standard protocols to estimate mitigation needs at the initial phases of a RAMP assessment, some generalizations about the size and scope of each project are necessary to create an overall footprint for each road project, so that it can be used to assess other environmental layers in a GIS. One difficulty has been identifying a standard transportation project descriptor that is specific enough to properly assign an appropriate footprint.

For the GIS data for planned transportation projects, RAMP projects typically start with a spreadsheet of projects from each major funding source: STIP, SHOPP and CTC. Many of the fields are easily cross comparable: an identification number, general location information such as district, county and route, specific post mile start and end points, a text field describing the project location, and a text field describing the actual project. For SHOPP projects, a program code consisting of a component code and task code are included, which are standardized, although not descriptive enough to identify an appropriate buffer for estimating the total project footprint. An example of a project code is 201.010 Safety Improvements (Collisions Reduced). STIP and CTC projects have a CTC Project Category and Tier, which again are standardized, but not descriptive enough to use for defining project footprints. Project descriptions are much more specific and helpful in determining footprint buffers, but these are not standardized, and often describe multiple treatments or actions within one project. For example, a project description might be "Widen shoulders, install traffic signals and upgrade barriers." These actions would all have a different estimated footprints associated with them, and it is difficult to ascertain specifically where along the project route each is scheduled to occur.



One recommendation is to add a standardized project description for the purpose of defining a project's footprint estimate. If planned projects are to have multiple treatments, such as widening shoulders for one section and upgrading barriers throughout, separate rows should be created for each action, and the specific post mile location information should be modified to reflect only the section of road with that action, if that information is known.

Additionally, it would be beneficial to align these standardized project descriptions with other departments within Caltrans, so that the estimates can be understood system-wide. For example, the Highway Design Manual already describes in detail specifications for different road project types, and has in many cases minimum distances for certain project types or equations for calculating such distances. If more information could be gathered and included for the planned projects, such as speed limit and vehicle volume, Highway Design Manual equations could be incorporated into the buffer estimates, resulting in a more accurate assessment.

### **Improving Communication**

The RAMP Work Group made an explicit effort at outreach to agencies and organizations external to the work group. Numerous groups have been briefed on both the Draft Statewide Framework and on the pilot project over the course of the past several years. These efforts were relatively effective at introducing non-involved parties to the goals of the RAMP process.

However, there remains work to be done, especially in the current pilot area. There are organizations important to regional land use decisions (e.g. local transportation agencies, regional land trusts, and other non-governmental organizations) that have not received a background briefing on RAMP. In order to create a more seamless conservation strategy in the region, in which mitigation can play an important role, greater outreach needs to take place.

Perhaps a larger gap in the RAMP communications efforts so far, however, has been internal to the agencies that comprise the Work Group. There are several classes of communications needs internal to Caltrans: between divisions within agencies; between the headquarters staff that comprise the Work Group and regional/district staff; and within headquarters, between environmental staff and upper management decision makers. Similar needs are found within the resource agencies.

Most of the communications of RAMP goals and processes has taken place with biological staff within agencies that comprise the Work Group. While these personnel groups are certainly essential to be brought up to speed on RAMP, they are not a sufficient subset of employees to make RAMP a programmatic approach to infrastructure mitigation. Others within Caltrans include real estate, engineering, design, accounting, and legal departments, transportation planners, project managers, and program managers should also receive about the benefits of and parts they have to play in RAMP. Effective communication should be developed for outreach to these groups to help RAMP become "business as usual" within the agencies.

Much of the success of RAMP to date can be attributed to specific individuals within the agencies and the Work Group deciding that this approach to mitigation is worth pursuing. While there are few intra-agency mandates that dictated participation in the development of the RAMP approach, some individuals chose to pursue the establishment of RAMP within the context of traditional mitigation approaches. These individual decisions have provided much of the support for the more formalized RAMP process in place at this time. While it is somewhat unclear how to bring about a network of RAMP advocates, or champions, incentives at the Caltrans district and state level as well as increased and improved outreach, communication, and information sharing could contribute to this goal.

Further, while some departments within Caltrans headquarters are acquainted with or actively participate in RAMP, this is infrequently the case at the regional levels. Because RAMP implementation will need to take place at the district scale, it is crucial that communication strategies be developed to not only bring regional staff up to speed on RAMP, but also to market the benefits of a RAMP approach in order to facilitate adoption of RAMP as a best practice for staff trying to implement projects.

One potential communications product would be a set of webinars designed for specific departments or offices. These would provide the relevant important points without overwhelming time-limited staff with the full breadth of information on all RAMP details. While webinars are likely not sufficient as stand-alone communication, if coupled with face-to-face outreach they could serve as useful tools for both providing information and explaining the benefits of a RAMP approach.

Last, there has been a concerted effort on the part of headquarters staff within agencies to promote a shift toward programmatic advance mitigation practices. However, the benefits of advance mitigation have not yet overcome the necessary changes to accommodate a shift in statewide practices. Detailing some of the practical aspects of how advance mitigation could be accomplished, such as through the Draft Statewide Framework, and other efforts outlining the business case (Sciara, 2015) that can be made for advance mitigation have added to the sense of feasibility of the process. While this is an ongoing effort, more examples and detailed protocols for both project execution and financial handling of advance mitigation can only improve the communication between these two groups.

To make RAMP implementable on the ground, these kinds of project champions should be developed at the regional level within the agencies. Examples of outcomes from this can be found in Caltrans District 5, where regional staff have helped implement local RAMP activities (some even preceding the formal establishment of RAMP itself) resulting in successful mitigation in places such as Elkhorn Slough. In the case of Elkhorn Slough, there were difficulties in both transferring property to a long-term land manager and in utilizing additional mitigation credits leftover from the original transportation projects, although ultimately the land transfer was accomplished and the additional credits will be available to Caltrans. Examples of

advance mitigation attempts using the current system can offer lessons as to where changes may need to occur in the planning and execution of mitigating land in order to translate this process into a programmatic approach.

## **Scoping Tools**

The implementation of RAMP requires that an environmental scan be used in order to assess likely impacts, gauge potential mitigation needs, and locate potential portfolios of high quality sites for mitigation activities. There are two general ways to accomplish this goal: having agency GIS staff perform geospatial analysis using available GIS data, or (2) using an online, early scoping tool.

Using geospatial data layers to assess possible environmental impacts from a transportation project is likely the preferred option, as the data can be customized to fit the exact areas of project, the data layers can be updated as new data become available, and multiple geoprocessing tools can be used in the analysis. Drawbacks to this method include acquiring the necessary data layers and having the staff time to perform the analysis, since this method is generally more time consuming than using an online tool. Further, there could be inconsistencies in methods or data used between districts or individual users. CDFW's BIOS is one tool that could be used to distribute the geographic data. Other data libraries, such as Cal-Atlas and ARB's Geographical Information System (GIS) Library, are also excellent resources for acquiring data.

Using an online environmental scoping tool can also be used for geospatial analysis of impacts. Some of the benefits of using such a tool include: the availability of background and environmental data; ease of use even for those unfamiliar with GIS, having multiple projects under one profile for comparison; and the ability for multiple users to access the data without versioning issues. There are some drawbacks to using one of the available tools currently online. First, the background and environmental data that are preloaded on the web tool may not be sufficient for a complete environmental scan. Often the data that are available through an online scoping tool are national or statewide datasets, which may miss important local or regional environmental features. Some tools allow for additional layers to be uploaded, which would resolve that issue. Another drawback is that some tools will only allow the user to analyze one transportation project at a time which, for the RAMP process, would require further analysis using an outside program. Some examples of online tools include EcoAtlas, NEPAassist (EPA), ESA Webtool (FHWA), and IPaC (USFWS). Finally, having the natural resource data available online still requires that the transportation project footprints be developed and inserted, because spatial projections of impacts (as opposed to visual inspection) are needed.

The online tool EcoAtlas is where aquatic resource assessment data from California Rapid Assessment Method (CRAM) are stored. CRAM is a procedure for assessing and monitoring the conditions of wetlands in California that uses a four-step process that can be performed by a team of 2-3 trained practitioners, and as more areas are screened, more wetland data are made

available on EcoAtlas. This method can also be used to assess the performance of compensatory mitigation projects and restoration projects in the state.

## **Participating Agencies' Recommendations and Observations**

One of the goals of this project was to coordinate the mandates and processes for the state and federal agencies in order to find ways to accommodate the implementation of advance mitigation practices. For this purpose we interviewed key personnel who are informed about advance mitigation protocols at their agencies or who are directly involved in the regulatory process, for their perspective and about the perspectives of their respective agencies. They were asked about the opportunities and impediments they saw from their agency's point of view to implementing RAMP, and recommendations about how to make RAMP work within their agency. The information gathered during these interviews was summarized into seven agency profiles: Federal Highway Administration, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, California Department of Fish and Wildlife, State Water Resources Control Board and Strategic Growth Council (see Appendix A). In addition, four interviews were also conducted with Caltrans staff with jobs that are at least partially related to advance mitigation or regional planning and one interview with DWR staff who are pursuing advancement of advance mitigation at their agency.

Agency staff had recommendations in the areas of funding, communications and technical improvements.

## **RAMP Structure and Funding**

One of the largest obstacles to establishing a RAMP has been the lack of a funding mechanism to sustain the upfront cost of mitigation before a transportation project has been programmed. This point was repeated by outside agencies as well as within Caltrans. There were several suggestions as to how Caltrans could structure mitigation projects to allow for the initiation for RAMP or simply to expedite mitigation reimbursement.

Many of the agencies (California Department of Fish and Wildlife (CDFW) and the Federal Highway Administration (FHWA), and State Water Resources Control Board (SWRCB)) stressed the preference of using mitigation banks or in-lieu fee programs to help in regards to assurances as well as avoiding the potentially higher costs of permittee-responsible mitigation. This follows with the 2008 Final Rule on Compensatory Mitigation for Losses of Aquatic Resources, issued by U.S. Army Corps of Engineers (USACE) and U.S. Environmental Protection Agency (USEPA), which emphasizes the following preferred sequence for compensatory mitigation after impacts have been avoided and minimized to the extent possible:

1. mitigation bank
2. in-lieu fee program
3. permittee-responsible mitigation

The SWRCB strongly recommended use of the Sacramento District California In-Lieu Fee Program (National Fish and Wildlife Foundation or NFWF) by Caltrans, where possible. This

program was developed in compliance with the 2008 Final Rule and approved for use by the USACE Sacramento District, USEPA, National Marine Fisheries Service, SWRCB, the Central Valley Regional Water Quality Control Board and the Lahontan Regional Water Quality Control Board in 2014. The program makes credits available to satisfy compensatory mitigation needs of permittees for impacts to aquatic resources, including wetlands. There are two types of credits: vernal pool credits and aquatic resource credits for impacts to wetlands, other waters of the U.S. and California and aquatic species in 17 areas that are based on individual river systems.

Some recommendations dealt with reorganizing the process by which Caltrans fulfills mitigation. The FHWA suggested that if Caltrans could restructure their project programming so that mitigation was termed a stand-alone project, then multiple transportation projects' mitigation needs could be bundled and the funding could be reimbursed by FHWA in advance. FHWA also recommended Caltrans develop programmatic agreements with regulatory agencies (USFWS, USACE, Regional Water Quality), which would also allow costs for mitigation to be reimbursed more quickly. The Strategic Growth Council (SGC) recommends a two-pronged approach: first, with the development of pilot projects that allow for the full development of the protocols and with the assembly of the necessary participants to complete RAMP within set areas. This component would help to iron out many of the administrative, communication, and financial details of how to complete RAMPs in different parts of the state. Second, the SGC recommends making the RAMP approach more programmatic within Caltrans. This could be accomplished through the identification of points in the process of project delivery where protocols can be improved to incentivize the adoption of regional planning principles into the environmental mitigation process.

## Communications

Some of the broader suggestions for furthering RAMP include establishing programmatic agreements with the different agencies, such as U.S. Fish and Wildlife Service (USFWS) and the Department of California Fish and Wildlife (CDFW), or at least more alignment with other agencies when it comes to mitigation, as well as overall improving communication and outreach to other agencies.

There were also some specific recommendations on how to improve communication and alignment with other agencies. For example, California Department of Fish and Wildlife (CDFW) suggested that Caltrans begin engaging with their agency earlier on in the process, and continue talks throughout the mitigation assessment. From the perspective of USFWS, there is a need to show FWS field offices how to implement RAMP and operate the available tools, something that would necessitate better outreach.

Another suggestion was made by the U.S. Environmental Protection Agency (USEPA), to add responsibilities related to RAMP into the liaison job descriptions of Caltrans employees stationed at other agencies. These key personnel play an important role already in communicating between agencies, and could be well-positioned to collaborate on RAMP processes. Additionally, within

Caltrans there could be areas of communications improvement, such as including engineers, budgeting and programming into RAMP planning and discussions. It was recognized that for some agencies, such as CDFW, the liaison is already working on RAMP-related efforts, but that this could be more explicit for the liaisons in other agencies.

## Technical

In the area of technical improvements, there were several recommendations made by agency staff to help streamline the process of impact assessment as well as improve the overall quality of the assessment. For improving consistency and simplifying the process of impact assessment, the Standard Operation Procedure (SOP) for Determination of Mitigation Ratios was a document recommended by U.S. Army Corps of Engineers (USACE) and the State Water Resources Control Board (SWRCB). This document (see Appendix B) was created by the Department of the Army under Section 404 of the Clean Water Act and provides a checklist that determines mitigation ratios in a transparent fashion so that there is more agreement between Caltrans and the Agency over the mitigation ratio, as well as agreement between agencies (SWRCB and USACE). The checklist asks questions regarding:

- Mitigation site location
- Net loss of aquatic resource surface area
- Type conversion
- Uncertainty
- Temporal loss

Each section gives a score depending on the answer given, resulting in a final number that will translate to a mitigation ratio.

To improve the overall data quality and assessment output, there were several recommendations pertaining to online tools, platforms and data sources that could be helpful for advance mitigation planning. The Strategic Growth Council (SGC) recommended the development of an integrated data platform that would allow Caltrans and other agencies to assess the potential impacts from portfolios of projects. More specifically, USEPA and CDFW suggested using greenprints to focus attention to a particular area and calling to attention areas where several types of impacts (terrestrial and wetlands) overlap. The USFWS and CDFW recommended the use of Natural Community Conservation Plans (NCCP) and Habitat Conservation Plans (HCP). Additionally, with NCCPs and HCPs, as they represent efforts on the parts of other agencies toward regional-level conservation planning, it would be beneficial to have RAMP be compatible with and complement these existing plans.

Performing environmental impact estimations on all planned projects was another recommendation, made by CDFW, with the argument that in doing so, Caltrans could demonstrate they are practicing avoidance and minimization. There were some specific webtools and publically available datasets also mentioned to assist with an environmental scan. Datasets

mentioned by name include (with the recommending agency in parenthesis) California Natural Diversity Database (CNDDDB) (CDFW, USFWS), Areas of Conservation Emphasis (ACE-II) (CDFW), and The Nature Conservancy (TNC) boundaries (CDFW). Some webmapping tools or online portals include CDFW's Biogeographic Information and Observation System (BIOS) viewer (CDFW), USFWS Critical Habitat Mapping Services, maintained by Environmental Conservation Online System (ECOS) (USFWS), EcoAtlas (SWRCB), a mapping tool for aquatic resources, which includes the California Rapid Assessment Method (CRAM) database and is maintained by the San Francisco Estuary Institute. It should be noted that online tools are also of interest to the FHWA, which has piloted a test tool through the SHRPII program. The current status of that tool is unclear, but it was based on ARC-online, and could present an opportunity for Caltrans to collaborate with FHWA.



## SOURCES

- AECOM. 2012. *Draft Statewide Framework for Regional Advance Mitigation Planning in California*. Sacramento, CA.
- Environmental Protection Agency. 2008. Compensatory Mitigation for Losses of Aquatic Resources; Final Rule. Federal Register, Vol. 73, No. 70.
- FHWA. 2000. Federal Guidance on the Use of In-Lieu-Fee Arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act. <http://www.fws.gov/habitatconservation/Corps%20In-lieu-fee%20guidance.pdf>
- Fisher, Leah. 2014. Mitigation Banks & In-lieu Fee Programs. Presentation on June 27, 2014. U.S. Army Corps of Engineers.
- Huber, P.R., D.R. Cameron, J.H. Thorne, T.M. Frink. 2009. *Regional advance mitigation planning: a pilot study integrating multi-agency mitigation needs and actions within a comprehensive ecological framework*. Technical paper for ICOET Conference, Duluth, MN.
- National Fish and Wildlife Foundation. 2012. Sacramento California In-Lieu Fee Program Prospectus. [http://www.spk.usace.army.mil/Portals/12/documents/regulatory/public\\_notices/201200286\\_NFWF\\_ILF\\_Prospectus\\_23OCT12.pdf](http://www.spk.usace.army.mil/Portals/12/documents/regulatory/public_notices/201200286_NFWF_ILF_Prospectus_23OCT12.pdf)
- Sciara, G.C, J. Bjorkman, J. Lederman, J.H. Thorne, M. Schlotterbeck, M. Wachs. 2015. *Setting the Stage for Statewide Advance Mitigation in California: Statewide Advance Mitigation Funding and Financial Strategies (SAMFFS) Task 2 Project Background Report*. Internal report to Caltrans.
- Thorne, J.H., P.R. Huber, E.H. Girvetz, J. Quinn, M. McCoy. 2009. Integration of regional mitigation assessment and conservation planning. *Ecology and Society* 14(1).
- Thorne, J.H., P.R. Huber, E. O'Donoghue, M.J. Santos. 2014. The use of regional advance mitigation planning (RAMP) to integrate transportation infrastructure impacts with sustainability; a perspective from the USA. *Environmental Research Letters*, 9(6):065001.
- United States Environmental Protection Agency. 2008. Compensatory Mitigation for Losses of Aquatic Resources. Vol 73, No. 70.
- United States Environmental Protection Agency. *Mitigation Banking Factsheet*. Accessed on December 5, 2014. <http://water.epa.gov/lawsregs/guidance/wetlands/mitbanking.cfm>



## **APPENDIX A Agency Profiles**

### **Federal Highway Administration**

**Agency Mission:** To improve mobility on the Nation's highways through national leadership, innovation, and program delivery.

Relationship/Dealings with Caltrans:

- Financial and technical assistance.
- NEPA assignment for a handful of projects that were left with FHWA when NEPA was assigned to Caltrans in 2007.

Pertinent Law/Authority:

- Federal-Aid Highway Program in Title 23, United States Code (23 U.S.C.): supporting State highway systems by providing financial assistance for the construction, maintenance and operations of the Nation's highway network. Local government own and operate about 75% of the Nation's highway network.
- Moving Ahead for Progress in the 21<sup>st</sup> Century Act (MAP-21): language for encouraging the development of programmatic mitigation plans to help identify mitigation needs earlier in the transportation planning process to streamline future project reviews and target conservation in a more effective manner.
- Clean Air Act of 1977 includes a provision to ensure that transportation investments conform to a State's air quality implementation plan (SIP) for meeting Federal air quality standards. SIPs are developed via interagency consultation which include Caltrans, EPA, FHWA, FTA, local transportation agencies and air quality agencies.

Permits or Agreements :

- None.

Preferred Sequence of Mitigation (ex. Avoid/Minimize, then Bank, then In-Lieu Fee, etc.):

- FHWA is required to first avoid and minimize first.
- The use of mitigation banks or in-lieu fee programs are encouraged because they do not require endowments and avoid land holdings.

Programs, Datasets, Webtools, or other Features Recommended by Agency:

- The Federal Guidance on the Use of In-Lieu-Fee arrangements for Compensatory Mitigation under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act.
  - Contains a list of suggested inclusions for a formal ILF agreement with the Corps Jurisdiction and ILF sponsor

1. Geographic service area
2. Accounting procedures
3. Methods for determining fees and credits
4. A schedule for conducting the activities that will provide the compensatory mitigation
5. Performance standards for determining success of mitigation sites
6. Reporting protocols and monitoring plans
7. Financial, technical and legal provisions for remedial actions and responsibilities (contingency funds)
8. Financial, technical and legal provisions for long-term management and maintenance
9. A provision that clearly states that the legal responsibility for ensuring the mitigation terms of the permit conditions are fully satisfied rests with the ILF sponsor
10. A closed schedule for completing the ILF mitigation. This ensures that the mitigation will be accomplished in a timely way, and will avoid long-term accounting/auditing problems.

Recommendations for Caltrans to Further Advance Mitigation:

- Make mitigation a stand-alone project, then multiple projects' mitigation needs could be bundled and the funding could be reimbursed by FHWA in advance.
- Have a programmatic agreement with regulatory agencies (USFWS, USACE, Water Boards), which would allow costs for mitigation to be reimbursed more quickly.

Agency Contact for Advance Mitigation Assistance:

Shawn Oliver, Environmental/ROW Team Leader Transportation Engineer, 650 Capital Mall, Suite 4-100. 916-498-5048. Shawn.Oliver@dot.gov.

Larry Vinzant, Senior Environmental Specialist, 650 Capital Mall, Suite 4-100. 916-498-5040. Larry.Vinzant@dot.gov.

## **United States Army Corps of Engineers**

**Agency Mission:** “Deliver vital public and military engineering services; partnering in peace and war to strengthen our Nation’s security, energize the economy and reduce risks from disasters.”

The Regulatory Program is committed to protecting the Nation's aquatic resources, while allowing reasonable development through fair, flexible and balanced permit decisions. The Corps evaluates permit applications for essentially all construction activities that occur in the Nation's waters, including wetlands.

### Relationship/Dealings with Caltrans:

Caltrans is required to work with USACE to fulfill requirements under Section 10 of the Rivers and Harbors Act and Section 404 of the Clean Water Act. USACE evaluates permit application for proposed work in navigable waters of the U.S. and for the discharge of dredged and/or fill material into waters of the U.S. During the permit evaluation, USACE must ensure that impacts to waters of the U.S. are avoided and minimized to the maximum extent practicable, and that unavoidable impacts are compensated.

### Pertinent Law/Authority:

- Clean Water Act (CWA) – Section 404
- Rivers and Harbors Act – Section 10
- 2008 Final Rule on Compensatory Mitigation for Losses of Aquatic Resources, issued by USACE and USEPA, which emphasizes a watershed approach in selecting compensatory mitigation project locations.
- USACE uses the Standard Operation Procedure (SOP) for Determination of Mitigation Ratios, a document created by the South Pacific Division of USACE under Section 404 of the Clean Water Act. This document includes a checklist that determines mitigation ratios in a transparent. The checklist asks questions regarding:
  - Mitigation site location
  - Net loss of aquatic resource surface area
  - Type conversion
  - Uncertainty
  - Temporal loss

Each section gives a score depending on the answer given, resulting in a final number that will translate to a mitigation ratio.

### Permits or Agreements :

- Section 404 Permit. This allows the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative which would have less adverse impacts.

- Section 10 Rivers and Harbors Act Permit.

Required Sequence of Mitigation (ex. Avoid/Minimize, then Bank, then In-Lieu Fee, etc.):

- Avoidance
- Minimization
- Compensatory Mitigation

Programs, Datasets, Webtools, or other Features Recommended by Agency:

Recommendations for Caltrans to Further Advance Mitigation: None

Agency Contact for Advance Mitigation Assistance:

USACE: Lisa M. Gibson, Regulatory Permit Specialist, U.S. Army Corps of Engineers,  
Sacramento District. 1325 J St., Room 1350, Sacramento, CA 95814-2922.

[lisa.m.gibson2@usace.army.mil](mailto:lisa.m.gibson2@usace.army.mil)

## United States Fish and Wildlife Service

**Agency Mission:** “Our mission is to work with others to conserve, protect and enhance fish, wildlife and plants and their habitats for the continuing benefit of the American people.”

Relationship/Dealings with Caltrans:

The Endangered Species Act (ESA) is designed to regulate a wide range of activities affecting plants and animals designated as endangered or threatened, and the ecosystems upon which they depend. With some exceptions, the ESA prohibits activities affecting these protected species and their habitats unless authorized by a permit from U.S. Fish and Wildlife Service (FWS), depending on the species that the action may affect. Permitted activities are designed to be consistent with the conservation of the species.

The FWS Endangered Species program, located in each of the Field offices, issues permits for native endangered and threatened species. Permits or Authorizations issued by the Endangered Species program include:

- Section 7 ESA *Incidental Take Authorizations* are required when Federally-associated activities will result in take of threatened or endangered species. A Biological Assessment is required when requesting a Section 7 Consultation. This Authorization ensures that the effects of the authorized incidental take are adequately minimized and mitigated.
- *Incidental take permits* (Section 10(a)(1)(B) of ESA) are required when non-Federal activities will result in take of threatened or endangered species. A habitat conservation plan or "HCP" must accompany an application for an incidental take permit. The habitat conservation plan associated with the permit ensures that the effects of the authorized incidental take are adequately minimized and mitigated.

FWS permits are also required under the federal Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act.

Pertinent Law/Authority:

- Federal Endangered Species Act (ESA) – Section 7 and 10. This Act requires federal agencies to ensure that infrastructure projects do not jeopardize the continued existence of federally listed species or result in the loss of habitat for these species. Section 7 of the Act provides regulations when activities are authorized, funded, or carried out by a Federal Action Agency, while Section 10 provides regulations for private lands.
- Migratory Bird Treaty Act. This Act protects migratory bird species from harm, including the removal of nests.
- Bald and Golden Eagle Protection Act. This Act protects bald and golden eagles from disturbance, including habitat loss.

Permits or Agreements :

- Biological Assessment required under Section 7 of the Federal ESA for terrestrial species and non-anadromous/marine fish.

Preferred Sequence of Mitigation (ex. Avoid/Minimize, then Bank, then In-Lieu Fee, etc.):

- Avoidance
- Minimization
- Compensatory Mitigation
  - This could be accomplished through Habitat Conservation Plans (HCP)
  - USFWS-approved conservation banks
  - Permittee responsible mitigation

Programs, Datasets, Webtools, or other Features Recommended by Agency:

HCPs, CNDDDB, connectivity data, rare natural communities, species' Recovery Plans, and critical habitat boundaries

Recommendations for Caltrans to Further Advance Mitigation:

- Better outreach. The field offices need to be engaged to make RAMP work. Better communication is needed to show the field offices how to implement RAMP and operate the available tools.
- Consistency with the USFWS approach. RAMP needs to be compatible with the approaches that USFWS has in place for landscape level conservation planning. This includes HCPs, and USFWS approved mitigation banks.

Agency Contact for Advance Mitigation Assistance:

USFWS: Roberta Gerson, Regional Transportation Coordinator, USFWS Region 8, Sacramento, CA. [roberta\\_gerson@fws.gov](mailto:roberta_gerson@fws.gov). 916-978-6191.



## **United States Environmental Protection Agency**

**Agency Mission:** The mission of EPA is to protect human health and the environment.

To accomplish this mission, the EPA: Develops and enforces regulations. When Congress writes an environmental law, the EPA implements it by writing regulations. Often, the EPA sets national standards that states and tribes enforce through their own regulations. If they fail to meet the national standards, the EPA can help them. The EPA also enforces regulations they develop, and helps companies understand the requirements.

Relationship/Dealings with Caltrans:

- Review authority for NEPA
- Review authority/veto authority for USACE permits
- Can recommend mitigation for impacts from actions related to transportation
- For 404 Permit
  - Develops and interprets policy, guidance and environmental criteria in evaluating permit applications
  - Determines scope of geographic jurisdiction and applicability of exemptions
  - Reviews and comments on individual permit applications
  - Has authority to prohibit, deny, or restrict the use of any defined area as a disposal site (Section 404(c))
  - Can elevate specific cases (Section 404(q))
  - Enforces Section 404 provisions

Pertinent Law/Authority:

- 2008 Final Rule on Compensatory Mitigation for Losses of Aquatic Resources, issued by USACE and USEPA, which emphasizes a watershed approach in selecting compensatory mitigation project locations.
- Clean Water Act, Section 401, Water Quality Standards for Wetlands.
- Clean Water Act, Section 404, Permitting.

Permits or Agreements :

- None.

Preferred Sequence of Mitigation (ex. Avoid/Minimize, then Bank, then In-Lieu Fee, etc.):

- From the 2008 Final Rule on Compensatory Mitigation for Losses of Aquatic Resources
  - Avoid then Minimize, then compensatory. Note no net loss of wetlands
  - Mitigation bank
  - In-lieu fee program
  - Permittee-responsible mitigation

Programs, Datasets, Webtools, or other Features Recommended by Agency:

- Greenprints are a useful tool and a good way to focus attention to a particular area, and calling to attention areas where several types of impacts (terrestrial and wetlands) overlap.

Recommendations for Caltrans to Further Advance Mitigation:

- Caltrans should consider adding RAMP/SAMI responsibilities and roles into the job descriptions of Caltrans' liaisons posted in other agencies, like USACE, EPA and USFWS.

Agency Contact for Advance Mitigation Assistance:

Clifton Meek, Life Scientist, U.S. EPA, Region 9. Environmental Review Section –  
Transportation Team. (415) 9723-3839. 75 Hawthorne Street, ENF 4-2, San Francisco, CA  
94105

## **California Department of Fish and Wildlife**

**Agency Mission:** The Mission of the Department of Fish and Wildlife is to manage California's diverse fish, wildlife, and plant resources, and the habitats upon which they depend, for their ecological values and for their use and enjoyment by the public.

### Relationship/Dealings with Caltrans:

Caltrans works with CDFW to determine whether or not there are impacts to natural resources under several state laws. If it is determined that there are impacts to resources, CDFW evaluates Caltrans' proposed mitigation actions to determine if those actions are satisfactory to compensate for the temporary or permanent loss of those resources.

CDFW is partnered with Caltrans at headquarters and in the regional and district offices to participate in the development of Caltrans' Statewide Advance Mitigation Initiative (SAMI).

### Pertinent Laws and Authority:

- CFG Code Sections 2080.1 and 2081 (b) and (c). Protects threatened and endangered species that are listed by both the federal Endangered Species Act and/or the California Endangered Species Act (CESA), by requiring consultation with the California Department of Fish and Wildlife in the event that an otherwise lawful activity may result in the "take" of any listed species. CDFW is authorized to issue an incidental take through permits or memoranda of understanding. CESA mandates that projects should not be approved that would jeopardize the continued existence of state-listed species if alternatives are available that would avoid jeopardy.
- California Environmental Quality Act (CEQA). CEQA provides for regulation of activities which may affect the environment. The focus is on preventing environmental damage.
- CFG Code Sections 1602 (Streambed Alteration). Notification is required before any activity that could divert, obstruct, or change the natural flow or bed, channel, or bank of rivers, streams, or lakes.
- Natural Community Conservation Planning Act of 2003 (CFG Code Sections 2800 - 2835)
- Mitigation and Conservation Banking (CFG Code Sections 1797 - 1799)

### Permits or Agreements :

- 2080.1 Consistency Determination
- 2081 (b) and (c) Incidental Take Permit
- 1602 Lake and Streambed Alteration Agreement

Preferred Sequence of Mitigation (ex. Avoid/Minimize, then Bank, then In-Lieu Fee, etc.)

- Avoidance
- Minimization
- Compensatory Mitigation
  - This is can be accomplished through a Natural Communities Conservation Plan (NCCP) where available and where Caltrans is a participating entity.
  - CDFW-approved banks
  - Permittee-responsible mitigation

Programs, Datasets, Webtools, or other Features Recommended by Agency:

Participate in NCCPs and utilize datasets or programs such as ACEII, TNC Conservation priorities, CNDDDB, BIOS, connectivity data, rare natural communities, and Route Scan

Recommendations for Caltrans to Further Advance Mitigation:

- Engage with CDFW early and often.
- Bring Caltrans engineers and project managers into the conversation in the pre-planning stages.
- Use mitigation banks which are CDFW-approved. Banks provide assurances and long-term endowments.
- Utilize an environmental scan mapping program to better site projects and to avoid or minimize impacts.
- Develop standardized drawings for modifications to culverts, bridges, overpasses and stand-alone wildlife crossings to address habitat fragmentation by improving connectivity.
- Propose wildlife crossings as part of the mitigation proposals.

Agency Contact for Advance Mitigation Assistance:

CDFW: Jennifer Garrison, Habitat Conservation Planning Branch, Sacramento, CA.  
Jennifer.Garrison@wildlife.ca.gov. 916-653-9779.

## State Water Resources Control Board

**Agency Mission:** The mission of the SWRCB is “to preserve, enhance and restore the quality of California’s water resources, and ensure their proper allocation and efficient use for the benefit of present and future generations”.

### Relationship/Dealings with Caltrans:

Section 401 of the Clean Water Act (CWA) requires any applicant for a federal 404 permit to obtain a certification from the state that a proposed discharge of dredged or fill material into waters of the U.S. complies with all applicable state water quality standards. The SWRCB is designated as the state water pollution control agency for all purposes under the CWA, and the SWRCB (or one of the nine Regional Water Quality Control Boards) must certify that any federal 404 permit will meet state water quality standards. Water Boards may deny or condition 404 permits as necessary to ensure compliance. Conditions may specify stormwater management, placement of culverts, fugitive dust control, good housekeeping practices, use of hazardous material, refueling practices, invasive species control, use of cofferdams, etc.

Water Board staff works with Section 401 applicants, such as Caltrans, to avoid and minimize impacts to aquatic resources, if possible. If a project will result in temporary or permanent loss of aquatic resources, Water Board staff will determine the amount, type, location, monitoring, and reporting of any required compensatory mitigation.

The California Porter-Cologne Water Quality Control Act of 1970 gives the Water Boards a very broad authority and duty to protect waters in the state from degradation under Water Code Section 13000. The California Water Code applies to a broader set of waters than does the federal CWA. It is within the Water Boards’ purview to regulate impacts to waters outside of federal jurisdiction using their independent authorities under state law. Under the Porter-Cologne Act, discharges of dredged or fill material to non-federal waters are regulated by Waste Discharge Requirements (WDRs).

Permitted actions must not cause a violation of any applicable water quality standards, including impairment of designated beneficial uses for receiving waters as adopted in any applicable water quality control plan or policy. Any violation of a section 401 certificate, NPDES permit, or WDR is subject to remedies, penalties, process, or sanctions as provided for under state and federal law.

### Pertinent Laws/Authority:

- The Porter-Cologne Water Quality Control Act provides the primary authority for protection of all waters of the state, which is defined as “any surface water or groundwater, including saline waters, within the boundaries of the state.”

- Clean Water Act.2008 Final Rule on Compensatory Mitigation for Losses of Aquatic Resources, issued by USACE and USEPA, which emphasizes a watershed approach in selecting compensatory mitigation project locations.
- SWRCB uses the Standard Operation Procedure (SOP) for Determination of Mitigation Ratios, a document created by the Department of the Army under Section 404 of the Clean Water Act. This document is essentially a checklist that determines mitigation ratios in a transparent fashion so that there is more agreement between Caltrans and the Agency over the mitigation ratio, as well as agreement between agencies (SWRCB, USACE and USEPA). The checklist asks questions regarding:
  - Mitigation site location
  - Net loss of aquatic resource surface area
  - Type conversion
  - Uncertainty
  - Temporal loss

Each section gives a score depending on the answer given, resulting in a final number that will translate to a mitigation ratio.

#### Permits or Agreements:

- Section 401 Certification for federal permits under Section 404 of the Clean Water Act that activity will comply with State water quality standards (the California Code of Regulations section 3830 et seq.) as determined by regional arms of the State Water Resources Control Board, the Regional Water Quality Control Boards.
- National Pollutant Discharge Elimination System (NPDES) storm water permit
- Waste Discharge Requirements (WDRs) for non-storm discharges

#### Preferred Sequence of Mitigation (ex. Avoid/Minimize, then Bank, then In-Lieu Fee, etc.)

- Avoidance
- Minimization
- Compensatory Mitigation

#### Programs, Datasets, Webtools, or other Features Recommended by Agency:

- Sacramento District California In-Lieu Fee Program (National Fish and Wildlife Foundation or NFWF). Developed in compliance with the 2008 Final Rule and approved for use by the USACE Sacramento District, EPA, National Marine Fisheries Service, SWRCB, the Central Valley Regional Water Quality Control Board and the Lahontan Regional Water Quality Control Board. The program makes credits available to satisfy compensatory mitigation needs for permittees for impacts to wetlands. There are two types of credits: vernal pool credits and aquatic resource credits for impacts to wetlands, other waters of the U.S. and California and aquatic species in 17 areas that are based on individual river systems.

- CRAM (California Rapid Assessment Method) to know the condition of the water body before impact, and helps determine what type of mitigation will be required for a permit to be issued.
- EcoAtlas is a webmapping tool that provides free public access to information about the quantity and quality of California wetlands. This is where the CRAM database is stored.
- The Standard Operation Procedure (SOP) for Determination of Mitigation Ratios.
- RipZET to help determine stream impacts

Recommendations for Caltrans to Further Advance Mitigation:

- Adopt a watershed approach to mitigation planning early on in the process.
- Take advantage of the Sacramento District California In-Lieu Fee Program for compensatory mitigation needs, where possible.

Agency Contact for Advance Mitigation Assistance:

SWRCB: Bill Orme, Senior Environmental Scientist, State Water Resources Control Board.  
(916) 341-5464, 1001 I Street, Sacramento, CA 95814

NFWF: Stephanie Tom Coupe, Senior Director IDEA. 1133 Fifteenth St., N.W., Suite 1100,  
Washington D.C. 20005. [Stephanie.TomCoupe@nfwf.org](mailto:Stephanie.TomCoupe@nfwf.org). (202) 857-0166.

## **Strategic Growth Council**

**Agency Mission:** California's Strategic Growth Council (SGC) coordinates the activities of State agencies and partners with stakeholders to promote sustainability, economic prosperity, and quality of life for all Californians. The Council is made up of secretaries and directors or their representatives from the major California state agencies.

**Relationship/Dealings with Caltrans:** The SGC interacts with Caltrans on several fronts. SGC is interested in urban and infrastructure planning, and has a renewed focus on integrated regional planning. In this vein SGC is interested in supporting Caltrans to improve efficiency and outcomes from environmental mitigation, and is supportive of the RAMP concept. Additionally, the SGC plays a central coordinating role in the development of high speed rail in California, which as a component of transportation also has ties to Caltrans.

**Pertinent Law/Authority:**

- SB 372 (2008) signed into law, creating Strategic Growth Council, a cabinet level committee tasked with coordinating the activities of state agencies to:
  - Improve air and water quality
  - Protect natural resources and agriculture lands
  - Increase the availability of affordable housing
  - Promote public health
  - Improve transportation
  - Encourage greater infill and compact development
  - Revitalize community and urban centers
  - Assist state and local entities in the planning of sustainable communities and meeting AB 32 goals

**Permits or Agreements:**

- None. As a coordinating body, none of the permits typically required for the development of infrastructure projects are actually issued by this organization.

**Preferred Sequence of Mitigation (ex. Avoid/Minimize, then Bank, then In-Lieu Fee, etc.):**

**Programs, Datasets, Webtools, or other Features Recommended by Agency:** The SGC recommends the development of an integrated data platform that would allow Caltrans and other agencies to assess the potential impacts from portfolios of projects.

**Recommendations for Caltrans to Further Advance Mitigation:** The SGC recommends a two-pronged approach, with the development of pilot projects that allow for the full development of the protocols and assembly of the necessary participants to complete a RAMP within set areas. This component would help to iron out many of the administrative, communication, and financial details of how to complete RAMPs. Second, the SGC recommends making the RAMP



approach more programmatic within Caltrans. This can be through the identification of points in the process of project delivery where protocols can be improved to incentivize the adoption of regional planning principles into the environmental mitigation process.

Agency Contact for Advance Mitigation Assistance:

Denny Grossman, Senior Advisor for Environmental Science and Policy.

[denny.grossman@sgc.ca.gov](mailto:denny.grossman@sgc.ca.gov). (916)322-2318

## **APPENDIX B Standard Operation Procedure (SOP) for Determination of Mitigation Ratios**

<http://www.spd.usace.army.mil/Portals/13/docs/regulatory/qmsref/ratio/12501.pdf>

## **APPENDIX C 2008 Final Rule on Compensatory Mitigation for Losses of Aquatic Resources**

[http://water.epa.gov/lawsregs/guidance/wetlands/upload/2008\\_04\\_10\\_wetlands\\_wetlands\\_mitigation\\_final\\_rule\\_4\\_10\\_08.pdf](http://water.epa.gov/lawsregs/guidance/wetlands/upload/2008_04_10_wetlands_wetlands_mitigation_final_rule_4_10_08.pdf)