Draft Staff Report

Including the Substitute Environmental Documentation

Procedures for Discharges of Dredged or Fill Materials to Waters of the State

[Proposed for Inclusion in the Water Quality Control Plans for Inland Surface Waters and Enclosed Bays and Estuaries and Ocean Waters of California]

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State Water Board Staff, Mather Field vernal pool, April 2009

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1. ACRONYMS AND ABBREVIATIONS

APA	Administrative Procedure Act
BU	Beneficial Use
CALFED	California Bay-Delta Program
CBC	California Biodiversity Council
CCC	California Coastal Commission
CCR	California Code of Regulations
CDF	California Department of Forestry and Fire Protection
CDFW	California Department of Fish and Wildlife
CEQA	California Environmental Quality Act
CERES	California Environmental Resources Evaluation System
CIWQS	California Integrated Water Quality System
CNDDB	California Natural Diversity Database
Corps	United States Army Corps of Engineers
CRAM	California Rapid Assessment Method
CWA	Clean Water Act
CWMW	California Wetland Monitoring Workgroup
DPW	Department of Public Works
DWR	Department of Water Resources
EIR	Environmental Impact Report
ELI	Environmental Law Institute
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FY	Fiscal year
GHG	greenhouse gas
HCP	Habitat Conservation Plan
Hydromod TAC	Hydromodification Technical Advisory Committee
ICC	Interagency Coordinating Committee
IPCC	Intergovernmental Panel on Climate Change

LCP	Local Coastal Program
LEDPA	least environmentally damaging practicable alternative
LTS	Less Than Significant
MOU	Memorandum of Understanding
NCCP	Natural Community Conservation Plan
NI	No Impact
NOD	Notice of Determination
NOP	Notice of Preparation
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resource Conservation Service
NWP	Corps nationwide permit
OAL	Office of Administrative Law
SCH	State Clearinghouse
SCWRP	Southern California Wetlands Recovery Project
SED	Substitute Environmental Documentation
SEZs	stream environment zones
SFEI	San Francisco Estuary Institute
SWANCC	Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers
SWRCB	California State Water Resources Control Board
T&E	threatened and endangered
TAT	Technical Advisory Team
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WDR	Waste Discharge Requirements
WEF	Water Education Fund

2. EXECUTIVE SUMMARY

The State Water Resources Control Board (State Water Board) prepared this Staff Report, including Substitute Environmental Documentation (SED) (Staff Report) to evaluate the potential environmental effects of adopting the proposed *Procedures for Dredged or Fill Material to Waters of the State* (proposed Procedures) and comply with other requirements related to the development and adoption of water quality control plans and policies for water quality control. Previous drafts of the proposed Procedures have been referred to by the State Water Board as the *Water Quality Control Policy for Wetland Area Protection and Dredged or Fill Permitting*. However, the decision was made to convert the policy into a plan amendment to both the existing Water Quality Control Plan for Ocean Waters and forthcoming Water Quality Control Plan for Inland Surface Waters and Enclosed Bays and Estuaries of California. The title was shortened to better communicate to the public that the proposed dredged or fill procedures apply to all waters of the state, including both waters of the United States and waters of the state outside of federal jurisdiction, regardless of whether they meet the definition of a "wetland." In addition, by adopting the proposed Procedures as amendments to water quality control plans, they will automatically supersede any conflicting provisions in the regional water quality control boards' water quality control plans.[1]

The proposed Procedures consist of the following components: (1) a wetland definition, (2) wetland delineation procedures, and (3) procedures for application submittal, and the review and approval of Water Quality Certifications, Waste Discharge Requirements, and waivers of Waste Discharge Requirements for dredged or fill activities (henceforth collectively referred to as Orders). The State Water Board has developed the proposed Procedures and this report in compliance with existing regulatory requirements.

The State Water Board developed the proposed Procedures to address several important issues. First, there is need to strengthen protections for waters of the state that are no longer protected under the Clean Water Act (CWA) due to U.S. Supreme Court decisions, since the Water Boards have historically relied on CWA protections in dredged or fill discharge permitting practices. Second, there is inconsistency across the Water Boards in requirements for discharges of dredged or fill material into waters of the state, including wetlands. There is no single accepted definition of wetlands at the state level, and the Water Boards may have different requirements and levels of analysis with regard to the issuance of dredged or fill Orders. Third, current regulations have not been adequate to prevent losses in the quantity and quality of wetlands in California, where there have been especially profound historical losses of wetlands.

2.1 Program Background

The State Water Board has developed the proposed Procedures in the context of existing regulatory framework for the discharge of dredged or fill material to waters of the state. At the federal level, the CWA is the primary

[1] Water Code section 13170.

mechanism by which agencies regulate discharges to waters of the United States. The primary framework for protecting water quality at the state level is the Porter-Cologne Water Quality Control Act at Water Code section 13000 et seq. (Porter-Cologne Act), which requires waste discharge requirements (WDRs) for any discharge of waste that could affect the quality of waters of the state.[2]

Under the CWA, in order to discharge dredged or fill material into waters of the United States, applicants must obtain a CWA section 404 permit from the U.S. Army Corps of Engineers (Corps) and a section 401 water quality certification (401 certification) from the State Water Board or one of nine Regional Water Quality Control Boards (collectively, Water Boards) verifying that the project will comply with state water quality standards. In California, the Porter-Cologne Act requires that any discharge that could affect the quality of waters of the state, including waters that are not under federal jurisdiction, be permitted through WDRs. 401 certifications issued by the Water Boards also serve as WDRs under State Water Board Water Quality Order 2003-0017-DWQ.

When the Corps issues individual section 404 permits, applicants are subject to comprehensive review under the U.S. EPA's 404(b)(1) "Guidelines for Specification of Disposal Sites for Dredge or fill Material (federal Guidelines)." Under these regulations, the applicant must demonstrate that the following three sequential steps have been taken to reduce impacts to federal waters: 1) all practicable measures to avoid impacts must be exhausted; 2) minimization measures must be incorporated into the project design to further reduce any remaining impacts; and 3) if after all practicable avoidance and minimization measures have been applied, the applicant must provide compensatory mitigation for any unavoidable impacts. One of the requirements set forth by the federal Guidelines is that the applicant is required to provide an alternative analysis which is used by the Corps to select the least environmentally damaging practicable alternative (LEDPA) for the project. General permits issued by the Corps address specific classes of dredged or fill discharge activities that are similar in nature and/or involve the same or similar types of possible adverse effects which would cause only minimal environmental effects. The Corps issues a variety of general permits, including regional general permits (which cover a specific geographic area), programmatic general permits (for existing local, state or other federal programs) that protect waters of the United States to the standards of the CWA section 404 program, and nationwide general permits which cover types of activities such as linear transportation crossings, bank stabilization activities, and aquatic habitat restoration, establishment, and enhancement projects.

For Corps-issued general permits, an applicant need only qualify for the permit since the permit is already issued. For some general permits, the applicant notifies the Corps before initiating dredged or fill activities to water of the U.S. (notification is not required for select permits), and for others, the applicant can notify the Corps after initiating activities. When the Corps issues a general permit, all project review requirements of the federal Guidelines, including the alternatives analysis requirement, are satisfied for the applicant at a programmatic level.

[2] Water Code §§ 13260, 13263.

The Water Boards have issued 401 certifications for some general permits issued by the Corps. These include, but are not limited to, regional general permits for emergency projects and some classes of Nationwide permits that are exempt for review under California's Environmental Quality Act (CEQA). If an applicant believes a project qualifies to enroll under a 401 certification for a Corps general permit, the applicant need only file a Notice of Intent (NOI) for review by the Water Boards. Otherwise, the project proponent would submit an application for an individual 401 certification.

Description of Proposed Procedures

The proposed Procedures consist of the following main components: (1) a statewide wetland definition (2) delineation procedures and (3) procedures for regulation of discharges of dredged or fill material that apply to all waters of the state (including wetlands).

Wetland Definition

The statewide wetland definition is intended to provide clear and consistent direction for determining whether an aquatic feature is a wetland. This definition does not affect the meaning of "waters of the state" as it pertains to the Water Boards' jurisdiction pursuant to the Porter-Cologne Act, nor does it modify the current authorities of the Water Boards to protect water quality. Rather, a statewide wetland definition would provide consistent identification standards for certain types of aquatic features that are sometimes difficult to identify in the field, and for which current policy does not provide adequate guidance. It is important to note, however, that regardless of whether an aquatic feature meets the wetland definition criteria, it may not qualify as a water of the state under the jurisdiction of the Water Boards. Whether a wetland feature is also a water of the state under the jurisdiction of the Water Boards must be decided on a case-by-case basis by Water Board staff, as is presently the situation. In other words, the adoption of the wetland definition under this proposed Procedures do not automatically extend the Water Board's jurisdiction to every aquatic feature meeting the definition.

Delineation Procedures

The proposed Procedures provide wetland delineation procedures, by incorporating the established delineation procedures set forth by the Corps. The Corps' delineation procedures will be used to determine if an area meets the wetland definition in the proposed Procedures.

Dredged or Fill Procedures

The proposed Procedures supplement existing application submittal and review requirements for the regulation of discharges of dredged or fill material into all waters of the state (regardless of whether the waters of the state in question also meet the definition of wetlands). It would establish procedures for the Water Boards' review and approval of individual 401 certifications and WDRs (collectively, Orders) for these discharges. The Water Boards may issue an Order if, in general, an applicant has shown that:

- A sequence of actions was taken to first avoid, then to minimize, and lastly mitigate for adverse impacts to waters of the state;
- The potential impacts will not contribute to a net loss of the overall abundance, diversity, and condition of aquatic resources in a watershed;

- The discharge of dredged or fill material will not violate water quality standards and will be consistent with all applicable water quality control plans and policies for water quality control; and
- The discharge of dredged or fill material will not cause or contribute to significant degradation of the waters of the state.

The Water Boards would require an applicant to comply with the proposed "State Supplemental Dredged or Fill Guidelines (State Guidelines)," included in Appendix A of the proposed Procedures. The State Guidelines include relevant portions of the federal Guidelines. Full integration of the federal Guidelines was not possible due to jurisdictional and procedural differences. Therefore, relevant sections of the federal Guidelines were retained and non-applicable sections were excluded. Global changes and/or deletions were made to translated federal terms to the state equivalent, and account for existing state regulations.

Compliance under the Proposed Procedures

On average, 80 percent of dredged or fill Orders issued by the Water Boards are individual section 401 water quality certifications for Corps' section 404 permits. Since the proposed Procedures largely incorporate the federal Guidelines, much of the avoidance, minimization and mitigation procedures of proposed Procedures are already applied under the federal Guidelines and the Corps' current practices.

Another 19 percent of projects are regulated by general orders issued by the Water Boards for discharges that impact waters of the state that are also under federal jurisdiction or discharges to waters of the state only. When developing general orders, the Water Boards conduct programmatic analyses and include requirements to ensure that discharges that qualify for coverage under the general orders have only minimal impacts on aquatic resources. The Water Boards also review individual projects to determine whether they qualify for enrollment under these general orders. The proposed Procedures do not include any new requirements for general orders issued by the Water Boards.

The remaining one percent of Orders are WDRs for discharges to waters of the state that are not under federal jurisdiction. The proposed Procedures include requirements that apply to individual WDRs for discharges of dredged or fill materials to waters of the state that are outside of federal jurisdiction.

Finally, all of the Water Boards are currently applying all or some of the elements of the proposed Procedures to individual Orders. However, it is not possible to determine the full extent of each of the Water Boards' requirements simply by reviewing Basin Plans and existing Orders. This inconsistency, which creates uncertainty for the regulated community, is one of the main reasons for proposing these Procedures – to make regulation of dredged or fill materials to waters of the state consistent across the Water Boards.

2.2 Environmental Impacts

The environmental impacts associated with the proposed Procedures are evaluated in this Staff Report on a programmatic level. As such, this Staff Report is not as detailed as an environmental document that would be used to analyze an individual discharge of dredged or fill material project that would be regulated under the proposed Procedures. The State Water Board expects future environmental reviews of projects that are subject

to the proposed Procedures to identify project-specific environmental effects. At that time, the lead agency must identify any project-specific significant environmental effects, and adopt all feasible alternatives and mitigation for these effects. If no feasible mitigation or alternatives are available, the lead agency must adopt a statement of overriding considerations before approving the project, as required by CEQA.

Staff cannot predict the exact nature of environmental effects associated with future individual projects because such forecasting would require knowledge of future projects (e.g., scope, scale, location, and design) throughout the state.[3] However, the programmatic environmental impacts assessment may be representative of the types and magnitude of project-specific environmental effects. The State Water Board intends for the proposed Procedures to provide consistent identification of wetlands, and to strengthen efforts to avoid and minimize impacts to all waters of the state, through consistent application submittal and review requirements. This consistency may result in a greater avoidance, minimization, and compensation for impacts to waters of the state and reduction of discharges of dredged or fill materials, potentially resulting in the protection and retention of a greater proportion of aquatic resources relative to existing regulatory practice.

Further, given the relatively small number of projects that might be regulated differently under the proposed Procedures, compared to the existing regulatory framework, the State Water Board has determined that the programmatic environmental effect on all environmental impact categories will be less than significant, or there will be no impact. As such, the proposed Procedures will not result in any cumulatively considerable impacts when combined with other past, present, or reasonably foreseeable related projects.

2.3 Analysis of Alternatives to the Proposed Procedures

Although the proposed Procedures would not have any significant effects, the State Water Board considered a range of alternatives to the proposed Procedures, as suggested by various stakeholders. These alternatives address applicability of the proposed Procedures (no procedures, adoption of procedures for non-federal waters only, and administration of CWA section 404 program for all waters), the wetland definition (no statewide wetland definition, one two or three parameter definition), wetland delineation methods, procedures for the regulation of discharges of dredged or fill materials (no uniform permitting procedures, uniform permitting procedures based on Corps procedures). Ultimately, however, the requirements of the proposed Procedures represent the best option for meeting the objectives of the Water Boards while avoiding significant impacts.

[3] According to 23CCR3777(c), the "environmental analysis shall take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites, but the board shall not be required to conduct a site-specific project level analysis of the methods of compliance, which CEQA may otherwise require of those agencies who are responsible for complying with the plan or policy when they determine the manner in which they will comply."

2.4 Economic Considerations

The State Water Board expects that the proposed Procedures would affect a very small number of applicants each year differently than the regulatory baseline. Nonetheless, this Staff Report analyzes and explains potential costs of implementing the proposed Procedures.

The proposed Procedures provide flexibility as to the extent of the required environmental analysis associated with application submittal and review requirements. For example, if a project will have a minimal impact on water quality, then the Water Boards may waive certain requirements.

Under existing regulatory practice, applicants are likely to compile extensive documentation of environmental impacts, site design, stormwater controls, mitigation strategies, and other relevant factors, especially if the project is subject to review under CEQA. As such, analysis to examine alternatives that would avoid or minimize impacts to waters of the state may represent a small portion of the costs of the existing analysis. Projects that are less complex may not be subject to CEQA review. As such, the level of effort that would be needed would likely be commensurate with the scope and potential for adverse environmental impacts on the aquatic environment.

An environmental analysis for an individual project may or may not result in identifying alternate project designs that avoid or minimize adverse environmental impacts, including cumulative impacts. Whether such analyses leads to project design alterations with implications for overall project costs is also unknown. Design changes associated with avoiding areas recurrently inundated with water could lead to costs (e.g., if permit applicants are required to move the project to a more expensive upland lot away from wetlands) or cost savings (e.g., if design or site alterations lead to less extensive alterations or construction).

Since impacts to waters of the state are currently subject to compensatory mitigation requirements, the proposed Procedures are not likely to significantly change compensatory mitigation requirements on a statewide basis. However, there may be some minor increases or decreases in compensatory mitigation project requirements at the project level. For example, if the proposed Procedures result in a decrease of impacts to waters of the state for an individual project, there may be a decrease in the quantity of compensatory mitigation that would be required for those impacts. As such, there may be some indirect cost savings to project developers due to avoided compensatory mitigation requirements. For some individual projects, the converse may be true.

3. ORGANIZATION OF DOCUMENT

This Staff Report to identifies and evaluates potential adverse impacts to the environment of adopting the proposed Procedures and to propose necessary measures to reduce any potential adverse impacts to a less than significant level. This Staff Report includes the following sections:

- Section 4: Introduction – provides an overview of the purpose of the report and a discussion of the regulatory requirements fulfilled by this Staff Report.

Section 5:

- Project Background – provides background information for the proposed Procedures, including the regulatory background, Water Board program information, wetland importance and trends, and existing wetland regulations and initiatives in California.
- Section 6: Project Description – provides an overview of the project need, objectives, location, and methods of compliance with the proposed Procedures.
- Section 7: Project Location

Section 8: North Coast Hydrologic Region

A majority of the surface water in the North Coast hydrologic region is committed to environmental uses because of the "wild and scenic" designation of most of the region's rivers. Average annual precipitation in this hydrologic region ranges from 100 inches in the Smith River drainage to 29 inches in the Santa Rosa area.

Waterbodies that provide municipal water include the Smith, Mad, and Russian Rivers. Areas providing agricultural water are more widespread than those for domestic, municipal and industrial use, as they occur in all of the hydrologic units within the region. Many of the smaller communities and rural areas are generally supplied by small local surface water and groundwater systems. Water recreation occurs in all hydrologic units on both fresh and salt water, attracting over ten million people annually. Coastal areas receiving the greatest recreational use are the ocean beaches, the lower reaches of rivers draining to the ocean, and Humboldt and Bodega Bays. The Russian, Eel, Mad, Smith, Trinity, and Navarro Rivers and Redwood Creek provide the most freshwater recreational use.

Groundwater aquifers in the northeastern portion of the North Coast hydrologic region consist primarily of volcanic rock aquifers and some basin-fill aquifers. Coastal basin aquifers are predominantly found in the southern portion of this hydrologic region and along the northern coast. In general, though, a large percentage of this region is underlain by fractured hard rock zones that may contain localized sources of groundwater.

San Francisco Bay Hydrologic Region

Major rivers in the San Francisco Bay hydrologic region include the Napa and Petaluma, which drain to San Francisco Bay. Although this is the smallest hydrologic region in the state, it contains the second largest human population. Coastal basin aquifers are the primary type of aquifer system in this region.

These aquifers can be found along the perimeter of San Francisco Bay extending southeast into the Santa Clara Valley, as well as in the Livermore Valley. The northeastern portion of this region, which includes the eastern Sacramento–San Joaquin Delta, is underlain by a portion of the Central Valley aquifer system. The remaining areas in this region are underlain by fractured hard rock zones.

Central Coast Hydrologic Region

Groundwater is the primary source of water in the Central Coast hydrologic region, accounting for approximately 75% of the annual supply. Most of the freshwater in this region is found in coastal basin aquifers, with localized sources of groundwater also occurring in fractured hard rock zones throughout the region.

South Coast Hydrologic Region

The South Coast hydrologic region is divided among 3 Regional Water Boards because it is the most populous area of the state: Los Angeles, Riverside, and San Diego. Groundwater supplies approximately 23% of the region's water in normal years and about 29% in drought years. Like the Central Coast hydrologic region, the majority of aquifers in this region are coastal basin aquifers. In the eastern central portion of the region includes lies a small section of basin and range aquifer and the remainder of the region is comprises fractured hard rock zones.

Central Valley Hydrologic Region

The Central Valley hydrologic region is the largest in California, and encompasses the three subregions described below.

Sacramento River Hydrologic Subregion

The Sacramento River hydrologic subregion includes the entire drainage area of the Sacramento River, the largest river in California, and its tributaries. Groundwater in the northern half of this hydrologic subregion is, for the most part, contained in volcanic rock aquifers and some basin-fill aquifers. The southwestern half of this subregion is underlain by part of the Central Valley aquifer system. The remaining areas that comprise the southeastern half of the subregion and portions of the northern half of the subregion are underlain by fractured hard rock zones. Surface water quality in this hydrologic subregion is generally good. Groundwater quality in the Sacramento River subregion is also generally good, although there are localized problems.

San Joaquin River Hydrologic Subregion

A portion of the Central Valley aquifer system underlies nearly all of the eastern half of the San Joaquin River subregion, while the western half of this subregion consists of fractured hard rock zones. The groundwater quality throughout this hydrologic region is generally good and usable for most urban and agricultural uses, although localized problems occur.

Tulare Lake Hydrologic Subregion

A small area at the southern end of the Tulare Lake subregion is underlain by basin and range aquifers, while a majority of the western half is underlain by a portion of the Central Valley aquifer system. The eastern half, once again, consists of fractured hard rock zones.

Lahontan Hydrologic Region

The Lahontan hydrologic region encompasses two subregions: the North Lahontan and the South Lahontan.

The North Lahontan hydrologic subregion consists of the western edge of the Great Basin, and water in the region drains eastward toward Nevada. Groundwater in the northern half of this subregion is primarily contained in basin-fill and volcanic rock aquifers, with some fractured hard rock zones. The southern half of this region is dominated by fractured hard rock zones, but small segments of basin and range aquifers also exist in this part of the subregion.

In general, the water quality in the North Lahontan hydrologic region is good. In basins in the northern portion of the region, groundwater quality is widely variable. The groundwater quality along these basin margins tends to be of higher quality, but the potential for future groundwater pollution exists in urban and suburban areas where single-family septic systems have been installed, especially in hard rock areas. Groundwater quality in the alpine basins ranges from good to excellent.

The South Lahontan hydrologic subregion is bounded on the west by the crest of the Sierra Nevada and on the north by the watershed divide between Mono Lake and East Walker River drainages; on the east by Nevada and the south by the crest of the San Gabriel and San Bernardino mountains and the divide between watersheds draining south toward the Colorado River and those draining northward. The subregion includes all of Inyo County and parts of Mono, San Bernardino, Kern, and Los Angeles Counties.

The South Lahontan hydrologic subregion contains numerous basin and range aquifers, separated by fractured hard rock zones. Although the quantity of surface water is limited in the South Lahontan hydrologic subregion, the quality is very good, being greatly influenced by snowmelt from the eastern Sierra Nevada. However at lower elevations, groundwater and surface water quality can be degraded, both naturally from geothermal activity, and as a result of human-induced activities. Drinking water standards are most often exceeded for TDS, fluoride, and boron content. Groundwater near the edges of valleys generally contains lower TDS content than water beneath the central part of the valleys or near dry lakes.

- Environmental Impacts – describes the potential environmental impacts of the proposed Procedures.
- Section 9: Cumulative Impacts – describes the potentially cumulatively considerable impacts of the proposed Procedures in combination with past, present, and reasonably foreseeable future projects.

- Section 10: Issues and Procedures Alternatives – describes a reasonable range of potentially feasible alternatives that would attain the basic objectives of the proposed Procedures.
- Section 11: Economic Considerations

4. INTRODUCTION

This section provides an overview of the steps necessary for adoption of the proposed Procedures. Section 4.1 provides the purpose of the Staff Report for the proposed Procedures. Section 4.2 outlines the scoping process for the proposed Procedures. Section 4.3 describes the State Water Board's compliance with CEQA and public noticing requirements. Steps taken to obtain scientific peer review for specific elements of the proposed Procedures are outlined in Section 4.4. The rationale for providing an economic analysis as part of the Staff Report is described in Section 4.5. Sections 4.6 - 4.8 describes the proposed Procedures adoption process. Section 4.9 sets timing for implementation of the proposed Procedures after adoption.

4.1 Purpose of Staff Report

The State Water Board must comply with the California Environmental Quality Act (CEQA)[4] when adopting water quality control plans and policies. CEQA, adopted as state law in 1970, is meant to inform citizens and decision makers about all potential significant environmental impacts of a project (e.g., water and air quality, wildlife and habitats, public health and safety). The CEQA process also includes a thorough public review of the project and its potential impacts.

State Water Board staff prepared this Staff Report in compliance with the California Code of Regulations (CCR), title 23, §3775, et. seq. to identify, evaluate, and minimize potential adverse impacts to the environment of adopting the proposed Procedures. The Secretary for Natural Resources has certified the State Water Board's water quality planning process as an environmental regulatory program[5] meeting CEQA. The CCR[6] requires the State Water Board to prepare a report that, at a minimum, contains:

(1) A brief description of the proposed project (proposed Procedures);
(2) An identification of any significant or potentially significant adverse environmental impacts of the proposed Procedures;
(3) An analysis of reasonable alternatives to the proposed Procedures, and mitigation measures to avoid or reduce any significant or potentially significant adverse environmental impacts; and
(4) An environmental analysis of the reasonably foreseeable methods of compliance.

This Staff Report fulfills the State Water Board's requirements for preparation of an environmental document for public review, and is part of the substitute environmental documentation required to support the proposed Procedures. Other relevant documents used in the development of the proposed Procedures will be included in the administrative record, and will be made available on the State Water Board's website for the proposed Procedures.[7]

[4] Pub. Res. Code, CWC §13147 et seq.
[5] Cal. Code Regs. tit. 14, §15251(g).
[6] 23 CCR §3775 et seq.
[7] The State Water Board's website can be accessed at: http://www.waterboards.ca.gov/

4.2 CEQA Scoping

Public participation is an essential part of the CEQA process. Early consultation with the public and other agencies, also called scoping, provides the opportunity to identify the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in the environmental document.

The State Water Board held a public CEQA scoping meeting for the proposed Procedures on April 5, 2007. That initial effort was subsequently abandoned, and a new approach was developed (initiated by Resolution 2008-0026 in April 2008). New scoping sessions were held on July 18, 2008.[8]

On January 5, 2011, the State Water Board released an initial study of potential environmental impacts (State Water Board, 2011), and posted notice of its intent to hold a second round of scoping meetings on January 31, 2011 and February 8, 2011. Scoping also included formal consultation with agency and academic wetland scientists who were convened as a Technical Advisory Team (TAT); consultation with representatives from other regulatory agencies with authorities related to surface water permitting; and various informational stakeholder outreach meetings. These scoping efforts are described in more detail below.

The State Water Board received comment letters from 66 individuals or agencies during the noticed comment period from January 5, 2011 through May 20, 2011 as follows:[9] sixteen from business and industry interest groups; sixteen from environmental advocacy groups; two from federal agencies; twenty-five from regulated California state and local agencies; and three from other California state regulatory agencies. The State Water Board staff has since regularly consulted with various groups of interested parties, and other State and federal agencies. In addition, 8,023 form letters were received in September 2011, from members or supporters of environmental advocacy groups. The alternatives to the proposed Procedures that the State Water Board considered were largely based upon comments and alternative proposals received from various stakeholder groups and interested persons as an early part of the public process.

Technical Advisory Team

Water Board staff recognized very early in the proposed Procedures development process that independent scientific analysis would be needed to support key policy elements, especially the consideration of a wetland definition for use in the Water Quality Certification program, statewide. In the summer of 2008, the San Francisco Estuary Institute (SFEI) was contracted to convene a TAT whose purpose would be to recommend a wetland definition and wetland delineation methods to Water Board staff. This TAT was given the mission to:

> "…compare existing alternative wetland definitions, classification systems, and delineation methods in terms of their ability to protect the State's wetland resources, beneficial uses, and ecological services…[and] to (1) assemble existing definitions, classification systems, and

[8] Information about the scoping meetings are located on the State Water Board's web site at http://www.waterboards.ca.gov/water_issues/programs/cwa401/wrapp.shtml#historical

[9] Notices, the initial study, presentations, public comments, and other Information about the 2011scoping meetings and public comments are posted on the State Water Board's web site at http://www.waterboards.ca.gov/water_issues/programs/cwa401/wrapp.shtml#recent

delineation methods; (2) compare them in terms of comprehensive wetland protection; (3) recommend choices; and (4) illustrate our deliberations with case studies."

SFEI appointed Josh Collins, PhD, to lead this effort. Dr. Collins in turn recruited a team of respected scientists with extensive experience in wetland science and policy. Team members were drawn from research institutes, private consulting practice, and from state, federal and local agencies, including senior staff of the Corps. Water Board staff liaisons from the State Water Board and the San Francisco Bay Regional Water Quality Control Board were assigned to the TAT to participate in the deliberations and to provide a communication channel between the TAT and Water Board staff.

The TAT fulfilled its assigned duties through a well-documented process in which existing wetland definitions from around the U.S. and the world were compared. Special attention was given to definitions in use for wetland regulatory programs. The TAT found that creation of a new definition would better serve the purposes of the proposed Procedures than existing definitions. After the TAT recommended a definition to Water Board staff, it turned its attention to wetland delineation methods, and ultimately recommended the Corps' wetland delineation method to the Water Board for application under the proposed Procedures.

The TAT's methods and results are presented in a series of four technical memoranda to the Water Board. These memoranda were released and revised between June 2009 and September 2012. The final versions of these memoranda were published after consultation with Water Board staff and consideration of peer review comments. Water Board staff have used these memoranda in the development of the proposed Procedures.

Interagency Coordinating Committee

Water Board staff conducted routine consultation with other regulatory agencies with authorities pertaining to wetlands in the development of the proposed Procedures. This consultation was conducted through an Interagency Coordinating Committee (ICC) that was convened for this purpose. The ICC consisted of senior staff representatives from the agencies listed in Table 4-1 below, including the Assistant Deputy Director for the Division of Water Quality at the State Water Board and the Assistant Executive Officer of the San Francisco Bay Regional Water Quality Control Board, and senior scientists from SFEI. Six meetings of the ICC were convened, as shown in Table 4-1.

Table 4-1: Agencies Participating in the Interagency Coordination Committee

State Agencies	**Federal Agencies**
California Department of Fish and Wildlife (formerly Fish and Game)	U.S. Army Corps of Engineers, Sacramento, San Francisco and Los Angeles Districts
California Department of Forestry and Fire Protection	U.S. Environmental Protection Agency – Region 9
California Coastal Commission	U.S. Fish and Wildlife Service
	U.S. Department of Agriculture – Natural Resources Conservation Service

Table 4-1: Interagency Coordination Committee Meetings and Key Agenda Topics	
Meeting Dates	**Key Agenda Topics**
November 21, 2008	Presentation of procedures development goals and ideas; Introduction of draft wetland definition
August 27, 2009	Discuss first draft definition
May 20, 2010	Summary of procedures; Presentation of proposed delineation method.
Nov. 18, 2011	Presentation of TAT Memo 4 – Delineation; Summary of Water Boards steering committee decisions on development of procedures.
March 15, 2012	Presentation of proposed wetland definition as revised in response to peer review; Summary of current proposals
August 16, 2012	Review key provisions; Comparison to Corps regulations; implementation strategy

The ICC members provided many helpful and informative recommendations to Water Board staff. Most comments were focused on how implementation of the proposed Procedures might be in conflict with those agencies existing regulatory programs. These comments were carefully considered by Water Board staff in the drafting of the proposed Procedures.

Informal Stakeholder Outreach

Opportunities for outreach occurred when various organizations invited State Water Board staff to make presentations on the proposed Procedures and its development process. Individuals and representatives of interest groups also requested meetings with staff to present concerns, ideas, and opinions regarding the proposed Procedures. These are listed in Table 4-2.

Table 4-2: Outreach Meetings and Presentations with Interested Groups		
Date	**Group/Event**	**Topics**
May 20, 2008	Northern California Conservation Partners meeting with staff	Advocates for mitigation planning and banking businesses met with staff to describe concerns and ideas from the mitigation banking industry
July 23, 2008	Bay Planning Council regular meeting and workshop	Staff delivered a presentation on the proposed procedures as one agenda item.
October 30, 2008	Urban Water Institute 7th Annual Clean Water Conference	Staff delivered a presentation on the proposed procedures as one program topic.
February	Road Ecology Management	Staff delivered a presentation on the proposed procedures as

26, 2009	Conference for Caltrans staff	one program topic.
February 7, 2010	San Francisco Bay Wetlands Monitoring Group – Volunteer Monitoring Workshop	Staff delivered a presentation on aspects of the proposed procedures pertaining to wetland monitoring.
June-July 2010	Informal stakeholder meetings	Meetings to hear comments on potential procedure issues with stakeholders representing: (1)agriculture, timber and range; (2)business; (3)environmental; (4) federal and tribal; (5) public health; and (6) local agencies
April 2013	Informal stakeholder meetings	Meetings to hear comments on proposed Procedures with stakeholders representing: (1) business; (2) utilities; (3) environmental; and (4) wetland restoration
April-May 2016	Informal stakeholder meetings	Meetings to discuss any outstanding issues prior to public release

Next Steps in the Public Process

The proposed Procedures, draft Staff Report, and other relevant information will be circulated for public comment, and presented and considered by the State Water Board at public meetings in 2016. If adopted, the regulatory provisions of the proposed Procedures must be approved by the Office of Administrative Law (OAL), and a Notice of Decision and fees must be submitted to the California Resources Agency. The State Water Board would also submit the adopted Procedures and supporting documentation to the United States Environmental Protection Agency (USEPA) for informational purposes.

4.3 State Clearinghouse

The State Clearinghouse (SCH) was established in 1973, as a division of the Governor's Office of Planning and Research. SCH coordinates the distribution and State-level review of CEQA documents,[10] and provides information and assistance on the environmental review process. Public agencies that are responsible for preparing CEQA environmental documents for proposed projects must make those documents available for public review. All Notices of Preparations (NOPs), draft Environmental Impact Reports (EIRs), and draft Negative Declarations for projects that involve a California state agency or area of statewide, regional, or area-wide significance must be submitted to SCH. [11] SCH distributes these documents to relevant California state agencies and coordinates the transmittal of California state comments back to the Lead Agency. The minimum review period for EIRs is 45 days. If a project requires discretionary approval from a State agency, a Notice

[10] The CEQA Guidelines, Cal. Code Regs. tit. 14, §15000 et seq., describes the SCH's roles and responsibilities regarding environmental review.
[11] Cal. Code Regs. tit. 14, §15205 and §15206.

of Determination (NOD) must also be filed with SCH.[12] The filing of the NOD begins a 30-calendar-day statute of limitations on court challenges to the project approval under CEQA. The SCH maintains a searchable computerized information system ("CEQAnet") of all environmental documents it processes, which is available for use by other State agencies, local governments, and project applicants.[13]

Exempt regulatory programs, such as the Water Boards' water quality planning process, are not required to use the SCH. The Water Boards are independently responsible for noticing, posting, and circulating environmental documents to the public and relevant State and federal agencies. However, exempt regulatory programs may submit documents to SCH in order to widen the circulation of the documents and ensure broader public participation. Accordingly, the SCH is being used for the posting and circulation of environmental documents for the proposed Procedures, in addition to posting the documents on the State Water Board's program website[14] and emailing interested parties. The State Water Board has filed a NOP (1/7/2011) for an initial study checklist and a draft EIR[15] with SCH, and has posted notice of CEQA scoping meetings through SCH.

4.4 Peer Review

State law (Health and Safety Code §57004) requires that when departments in the California Environmental Protection Agency (including the State Water Board) adopt plans, policies, amendments or regulations that have a scientific basis, the scientific data and analysis which serve as the basis for the regulation must undergo peer review. The State Water Board provides strict guidelines for these peer reviews.[16] The peer reviewer's responsibility is to determine whether the scientific findings, conclusions, and assumptions are based upon sound scientific knowledge, methods, and practices. Peer reviewers must not have been involved in any way with the development of the state agency proposal. The number of reviewers and the specialties represented should be appropriate to the complexity of the issue.

The State Water Board has contracted with the University of California to provide independent scientific peer review services prior to adoption of any regulation. The results of the peer review, along with staff analysis of the reviews, are made available to the public and become part of the administrative record of the regulatory action.

The proposed Procedures largely includes dredged or fill permitting procedures that are based on policy considerations, not scientific considerations. However, two aspects of the proposed Procedures are based on scientific findings, conclusions, or assumptions: a) a wetland rapid assessment method that is consistent with the requirements of the proposed Procedures, and b) the proposed wetland definition and delineation methods. The State Water Board submitted the rapid assessment method and wetland definition for external scientific peer review to verify that the scientific findings, conclusions, and assumptions are based upon sound scientific

[12] Cal. Code Regs. tit. 14, §15075.
[13] See http://www.ceqanet.ca.gov/.
[14] See http://www.waterboards.ca.gov/water_issues/programs/cwa401/wrapp.shtml.
[15] See SCH # 2011012009.
[16] See http://www.waterboards.ca.gov/water_issues/programs/peer_review/

knowledge, methods, and practices. The peer reviews were successfully accomplished in 2010 and 2011, respectively.

The peer review of the rapid assessment method[17] focused on the California Rapid Assessment Method (CRAM). This rapid assessment method is currently the most widely used in California for this purpose, and has proven to be a cost-effective and scientifically defensible rapid assessment method for monitoring the ecological conditions of various aquatic resource types found in California. It has also been used to assess the performance of compensatory mitigation projects and restoration projects. CRAM is a level 2 assessment method within the USEPA's three level framework for wetland monitoring where level 1 includes habitat mapping information and level 3 consists of intensive quantitative data collected to validate Level 1 and Level 2 information. The request for review considered the method itself, but also focused on the methods by which CRAM was developed, the proposed future development of the method, and the proposed quality assurance measures.

The peer review of a proposed Water Board wetland definition and delineation methods[18] focused on its application under the section 401 certification program in California and associated state regulatory efforts under The Porter-Cologne Act. The proposed definition and delineation methods draw upon CWA rules and procedures, but add considerations for application under The Porter-Cologne Act and for California's unique ecological conditions.

Peer reviewers' comments in both reviews provided many helpful recommendations that have been used to revise and improve the proposed assessment methods, definition, and delineation methods.

4.5 Economic Considerations

As discussed in Section 11, a formal economic analysis is not required for the proposed Procedures. Nevertheless, this Staff Report contains an analysis of possible costs to implement the proposed Procedures. This analysis is contained in Section 11 of this document.

4.6 Approval by OAL

The Administrative Procedures Act (APA)[19] establishes rulemaking procedures and standards for state agencies in California. The requirements set forth in the APA are designed to provide the public with a meaningful opportunity to participate in the adoption of state regulations and to ensure that regulations are clear, necessary, and legally valid. A regulation is a rule or standard of general application that implements, interprets, or makes specific the law enforced or administered by the agency that adopted the regulation. Substantial portions of the proposed Procedures meet the definition of a "regulation."

[17] The review and a staff analysis are available at http://www.waterboards.ca.gov/water_issues/programs/peer_review/cram.shtml
[18] The peer review documents are available at http://www.waterboards.ca.gov/water_issues/programs/cwa401/wrapp.shtml
[19] Govt. Code §11340 et seq.

State regulations must be adopted in compliance with regulations of OAL.[20] OAL reviews regulatory provisions of Water Quality Control Plans, Policies, and Guidelines for compliance with six standards set out in the APA.[21] These six standards are necessity, authority, reference, consistency, clarity, and non-duplication.[22]

To satisfy the "necessity" standard, the record for the proposed Procedures must contain substantial evidence demonstrating the need for the regulatory provisions, including a description of the public problem or other condition that each provision of the regulatory action is intended to address and the data that supports proposing the action. "Authority" is the provision of law which permits or obligates an agency to adopt, amend, or repeal a regulation. "Reference" means the statute, court decision, or other provision of law which an agency implements, interprets, or makes specific by adopting, amending or repealing a regulation. "Consistency" means being in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, or other provisions of law. "Clarity" is defined as "written or displayed so that the meaning of regulations will be easily understood by those persons directly affected by them." "Nonduplication" means a regulation does not serve the same purpose as a state or federal statute or another regulation. However, a regulation may duplicate or overlap a state or federal statute or regulation where necessary to satisfy the clarity standard, or where mandated or authorized by federal law.

OAL must make a decision within 30 calendar days of receiving a complete administrative record. OAL does not generally accept comments on proposed regulations during the review process. After OAL approves a proposed regulation adopted by a state agency, it files the regulation with the California Secretary of State and publishes it in the CCR.[23]

4.7 Submittal of Notice of Decision and Filing Fees

CEQA[24] requires state agencies and departments to submit a Notice of Decision to the Office of the Secretary for the California Natural Resources Agency for projects approved under a certified regulatory program. The CEQA Checklist with findings, adopted Resolution, final regulatory language, and proof of OAL approval are generally submitted with the Notice of Decision. The Notice of Decision is posted for public inspection for a period of not less than 30 days. Filing a Notice of Decision will result in a shorter statute of limitation for CEQA lawsuits.

The California Department of Fish and Wildlife (CDFW)[25] is a department within the California Natural Resources Agency that manages and protects the state's diverse fish, wildlife, plant resources, and native habitats. CDFW is responsible for consulting with agencies and providing the requisite biological expertise to review and comment on CEQA documents, and recommend mitigation measures. CDFW must be notified when a CEQA project involves fish and wildlife of the state, rare, and endangered native plants, wildlife areas, and ecological

[20] California Code of Regulations, tit. 1, §1-§280.
[21] Govt. Code §11353(b).
[22] Govt. Code §11349(a) through §11349(f).
[23] The CCR is available online at http://ccr.oal.ca.gov/
[24] 23 CCR §3781; Public Resources Code §21080.5
[25] See http://www.dfg.ca.gov/

reserves. CDFW collects a filing fee[26] for Certified Regulatory Programs) to offset the costs of reviewing environmental documents (e.g., the proposed Procedures, Staff Report, and CEQA Checklist). The filing fee must be paid to the Secretary for Resources before the respective Notice of Decision is submitted to the California Natural Resources Agency.

4.8 Submittal to USEPA

Section 303(c) of the CWA requires USEPA to review and approve or disapprove new or revised state-adopted water quality standards. For purposes of §303(c) of the CWA, water quality standards generally include designated beneficial uses, water quality criteria, and antidegradation policies. USEPA has 60 days to approve or 90 days to disapprove water quality standards submitted by states. In certain cases, USEPA may conditionally approve a state's standards.

USEPA reviews a state submittal to ensure that new or revised state-adopted water quality standards meet the requirements of the CWA. Before approving any state-adopted water quality standards, USEPA must first consult with the United States Fish and Wildlife Service (USFWS) to ensure that the action will not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat.[27]

Once adopted by the State Water Board and approved by OAL, the State Water Board will submit the proposed Procedures to USEPA with all required documentation in accordance with the federal CWA.[28] In the view of the State Water Board, however, there are no changes to surface water quality standards in the proposed Procedures that would be subject to USEPA approval.

Implementation of the proposed Procedures through section 401 certification and WDRs permitting is part of the continuing planning process, but does not require USEPA approval. To the extent that the proposed Procedures address matters outside the scope of the CWA, the proposed Procedures will be provided to USEPA for its information only.

4.9 Effective Date of the Procedures

In the absence of explicit effective dates, adopted policies and plans go into effect on the date of approval by the final approving authority (if the CDFW filing fee has been paid). In most cases (surface water quality standards actions), the final approving authority is USEPA. For regulatory actions that do not require USEPA approval (e.g., groundwater standards), OAL's approval is final. Amendments that do not have a regulatory component (e.g., administrative changes) are in effect when approved by the State Water Board. The proposed Procedures will become effective upon approval by OAL. In effect, the proposed Procedures would apply to all application for discharges of dredged or fill material to waters of the state submitted after final approval by the OAL.

[26] Fish and Game Code §711.4
[27] As required by §7(a)(2) of the Endangered Species Act.
[28] 33 U.S.C. §1251, et seq.

5. PROJECT BACKGROUND

This section reviews the current regulatory programs in place to protect water quality and wetlands from dredged or fill impacts. Section 5.1 provides state and federal regulatory background for the proposed Procedures. Section 5.2 provides an overview of the Waters Boards' Water Quality Certification program, with representative data on different types of projects, impacts and mitigation required for waters of the state. Section 0 provides an overview of wetlands in California and their functions and services. Wetland protection concerns have been a focus of California and State Water Board policy development activities since the 1970s. Section 5.4 describes some of the main regulations and legal initiatives that have shaped wetland policy in California.

5.1 Regulatory Background

This section provides an overview of the relevant federal and state regulations governing discharges of dredged or fill materials to waters of the state.

Clean Water Act

In 1972, Congress enacted the CWA to restore and maintain the chemical, physical, and biological integrity of the Nation's waters.[29] The CWA[30] is the primary federal law controlling water pollution in the United States, which applies to all "waters of the United States," including many wetlands. Waters of the United States are defined[31] by USEPA and the Corps in federal regulations and roughly comprise the nation's navigable waters, and tributaries to those waters, that have a connection to interstate commerce.

Under CWA section 303(c), the states are primarily responsible for the adoption and periodic review of water quality standards for all waters within their boundaries, with oversight by the USEPA. Water quality standards consist of designated beneficial uses of waters, water quality objectives to protect beneficial uses, and an antidegradation policy.[32] The State Water Board is designated as the state water pollution control agency for all purposes under the CWA. [33]

Section 301 of the CWA prohibits the discharge of any pollutant except in accord with certain other provisions of the Act, including the permit program under CWA section 404 that authorizes the issuance of permits by the Corps for the discharge of dredged or fill material. Section 502 of the CWA defines "pollutant" as "dredged spoil, solid waste, incinerator residue, sewage, garbage, sewage sludge, munitions, chemical wastes, biological materials, radioactive materials, heat, wrecked or discarded equipment, rock, sand, cellar dirt, and industrial, municipal, and agricultural waste discharged into water." Dredged or fill material is thus considered a pollutant under the CWA.

[29] 33 United States Code (U.S.C.) §1251 et seq.
[30] 33 U.S.C. §1251 et seq.
[31] 33 C.F.R. §328.3(a) and 40 C.F.R. §230.3(s).
[32] See 33 U.S.C. §1313(c); 40 C.F.R. §131.6.
[33] Wat. Code § 13160

Under section 404 of the CWA, the Corps and USEPA regulate discharges of dredged or fill material to waters of the United States, pursuant to the federal Guidelines.[34] In addition, under section 401 of the CWA, applicants for section 404 permits must also receive a section 401 water quality certification from the state from which the discharge originates to ensure that the project will comply with all applicable provisions of the CWA and state water quality standards.

Definition of Terms

The CWA does not define either dredged or fill material; however, the USEPA and the Corps have agreed on regulatory definitions for these terms. The USEPA and the Corps defines "dredged material" to mean material that is excavated or dredged from waters of the United States. The term "discharge of dredged material" means any addition of dredged material into, including redeposit of dredged material (other than incidental fallback) within the waters of the United States. The term includes, but is not limited to, the following:

(i) The addition of dredged material to a specified discharge site located in waters of the United States;
(ii) The runoff or overflow, associated with a dredging operation, from a contained land or water disposal area; and
(iii) Any addition, including redeposit other than incidental fallback, of dredged material, including excavated material, into waters of the United States which is incidental to any activity, including mechanized land clearing, ditching, channelization, or other excavation.

The term "discharge of dredged material" does not include the following:

(1) Discharges of pollutants resulting from the onshore subsequent processing of dredged material that is extracted for any commercial use (other than fill);
(2) Activities that involve only the cutting or removing of vegetation above the ground (e.g., mowing, rotary cutting, and chainsawing) where the activity neither substantially disturbs the root system nor involves mechanized pushing, dragging, or other similar activities that redeposit excavated soil material; or
(3) Incidental fallback.

Examples of dredging activities include stream widening or deepening, channel relocation, and mining. Note that suction dredge mining for mineral recovery is regulated primarily under CWA section 402, not section 404.

The USEPA and the Corps defines "fill material" to mean material placed in waters of the United States where the material has the effect of replacing any portion of a water of the U.S. with dry land; or changing the bottom elevation of any portion of a water of the United States. For example, dirt, sand, gravel, rocks, shells, pilings,

[34] USEPA issued interim final Guidelines in 1975 and the final Guidelines in 1980 following consultation with the Corps and public notice and comment (45 Fed. Reg. 85,336, Dec. 24, 1980). On March 31, 2008, USEPA and the Corps amended the Guidelines (Subpart J) with revised regulations governing compensatory mitigation for authorized impacts to wetlands, streams, and other waters of the United States under section 404 of the Clean Water Act (73 Fed. Reg. 19687, Apr. 10, 2008).

mulch and concrete are all considered fill if they are placed in a wetland or other surface water. Note that fill material does not include trash or garbage regardless of the purpose for their deposit.

The term "discharge of fill material" means the addition of fill material into waters of the United States. The term generally includes, without limitation, the following activities: Placement of fill that is necessary for the construction of any structure or infrastructure in a water of the United States; the building of any structure, infrastructure, or impoundment requiring rock, sand, dirt, or other material for its construction; site-development fills for recreational, industrial, commercial, residential, or other uses; causeways or road fills; dams and dikes; artificial islands; property protection and/or reclamation devices such as riprap, groins, seawalls, breakwaters, and revetments; beach nourishment; levees; fill for structures such as sewage treatment facilities, intake and outfall pipes associated with power plants and subaqueous utility lines; placement of fill material for construction or maintenance of any liner, berm, or other infrastructure associated with solid waste landfills; placement of overburden, slurry, or tailings or similar mining-related materials; and artificial reefs. The term does not include plowing, cultivating, seeding and harvesting for the production of food, fiber, and forest products, but does include projects involving stream bank stabilization and stream crossings.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Act provides a framework to protect water quality in California. The Porter-Cologne Act was enacted in 1969 as Division 7 of the Water Code,[35] and is the primary water quality law in California. The Porter-Cologne Act addresses two primary functions: water quality control planning and waste discharge regulation. The State Legislature, in adopting the Porter-Cologne Act, directed that California's waters "shall be regulated to attain the highest water quality which is reasonable" and charges the Water Boards with protecting all waters of California, defined as "any surface water or groundwater, including saline waters, within the boundaries of the State."[36] This encompasses all waters of the state, including those not under federal jurisdiction.

This statute identifies the nine major hydrologic basins in the state, establishes the Regional Water Boards with responsibility for each basin, and directs that each Regional Water Board adopt a water quality control plan (basin plan). [37] Each basin plan identifies the beneficial uses of all waters in the basin, specifies numeric and narrative water quality objectives needed to protect the uses, and presents an implementation strategy. The Porter-Cologne Act further requires that anyone who plans to discharge waste where it might affect waters of the state must first notify the Water Boards. The Water Boards identify the sources of pollutants that threaten the quality of the state's waters and regulate those sources by imposing requirements to control the discharge of pollutants in permits. The Porter-Cologne Act also provides a variety of civil and criminal enforcement tools.

Under the Porter-Cologne Act, the Water Boards regulate waste discharges that could affect water quality by issuing WDRs. Discharges of dredged or fill materials have historically been treated as discharges of waste by the Water Boards. In 1972, the California Legislature amended the Porter-Cologne Act to provide the state the necessary authority to implement CWA section 402, or the National Pollutant Discharge Elimination System

[35] Wat. Code §13000 et seq.
[36] Wat. Code §13050, subd. (e).
[37] Basin Plans and state plans are available on the State Water Board's website at: http://www.waterboards.ca.gov/plans_policies/#plans

(NPDES), in lieu of a USEPA-administered program under the CWA. The Water Boards issue some WDRs that also serve as NPDES permits. Subsequent amendments have allowed the Water Boards to assume most of the responsibilities of the CWA, including the CWA section 404 permit program. To date, California has not applied for the 404 program.

The State Water Board oversees and guides the Regional Water Boards through several activities, including the adoption of regional water quality control plans and policies for water quality control. The State Water Board is also charged with adopting state plans and policies for water quality control, which may consist of principles or guidelines deemed essential by the State Water Board for water quality control. State policies[38] address water quality concerns for surface and groundwater that overlap regional board boundaries, are statewide in scope, or are otherwise considered significant.

The Water Boards require that discharges to high quality waters[39] comply with State Water Board Resolution No. 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," which generally requires that high quality waters be protected. The California antidegradation policy also incorporates the federal antidegradation policy which requires the maintenance and protection of existing uses and water quality conditions necessary to support such uses. In addition, the federal antidegradation policy maintains and protects water quality in outstanding national resource waters.

Key Regulatory Differences between the Clean Water Act and the Porter-Cologne Water Quality Control Act

The CWA regulates proposed discharges into waters of the U.S. The term "waters of the U.S." defines the extent of federal jurisdiction under the CWA. The definition uses explicit physical terms which include only surface waters, such as "navigable waters," the boundaries of which establish federal jurisdictional limits that apply to the Corps' section 404 permitting. Those limits include a requirement that each "water of the U.S." have a connection to interstate commerce. The Porter-Cologne Act, on the other hand, regulates discharges that could affect the quality of water of surface or ground waters, wherever those discharges may occur. Also, the Porter-Cologne Act defines "waters of the state" very broadly, with no physical descriptors, and no interstate commerce limitation. This means that the Water Boards' jurisdiction is over any proposed activity which could affect the quality of waters of the state regardless of the specific location of the proposed activity, while federal jurisdiction is generally limited to the discharge site, and within the defined boundaries of "waters of the U.S." In regulating discharges of dredged or fill material, therefore, the Water Boards' jurisdiction is more broad than federal jurisdiction.

[38] Adopted State policies are available on the State Water Board's website at: http://www.waterboards.ca.gov/plans_policies/#policies

[39] "high quality waters" refers to waters that have quality higher than necessary to be protective of state-designated beneficial uses.

Regulation of Discharges of Dredged or Fill Material in California

The regulation of dredged or fill material is accomplished through federal and state regulations. Applicants must comply with section 404 and section 401 of the CWA as well as the Porter-Cologne Act. In California, applicants must obtain a 401 certification for projects that receive a federal license or permit, such as a section 404 permit from the Corps, if waters that would be impacted fall under federal jurisdiction. If a project impacts waters of the state that do not fall under federal jurisdiction, the applicant need not obtain a section 404 permit or a 401 certification, but instead must receive approval from the Water Boards through the adoption of WDRs. Lastly, if a project would impact both waters inside and outside of federal jurisdiction an applicant would obtain a combination 401 certification/WDRs from the Water Boards and a section 404 permit from the Corps.

Federal and State Regulatory Framework for Dredged or Fill Discharges under Individual Orders

Discharges of dredged or fill material to waters of the state must comply with federal and state requirements (tables 5-1 and 5-2, respectively). The Corps has primary permitting authority for CWA section 404, subject to USEPA approval, and issues individual and general permits. The Corps issues individual permits for specific discharges, and general permits for classes of activities on a regional, programmatic or nationwide basis. An applicant must obtain a section 404 permit from the Corps before discharging dredged or fill material into waters of the United States.

When applying for individual section 404 permits, applicants are subject to comprehensive review under the federal Guidelines. Under these regulations, the applicant must demonstrate that three steps, in the following sequence, have been taken to reduce impacts to federal waters: first, all practicable measures to avoid impacts to federal waters must be exhausted; second, minimization measures must be incorporated into the project design to further reduce any remaining impacts; and lastly, if after all practicable avoidance and minimization measures have been applied, the applicant must provide compensatory mitigation for any unavoidable impacts. The applicant is required to provide this information as an “alternatives analysis” when applying for an individual permit. Under the federal Guidelines, the Corps is required to select the least environmentally damaging practicable alternative (LEDPA) for the project.

For projects that impact waters of the state that are also under federal regulation, an applicant must obtain a section 404 permit from the Corps and a section 401 water quality certification from the Water Boards verifying that the project will comply with state water quality standards. For projects that would impact waters of the state that are outside federal jurisdiction, applicants must obtain WDRs from the Water Boards. In cases when a project may impact waters of the state that include waters both inside and outside of federal jurisdiction, an applicant must obtain a section 404 permit from the Corps, and a combination section 401 certification and WDRs from the Water Boards.

Table 5-1: Federal Regulatory Framework for Discharges of Dredged or Fill Material Into Waters of the United States, Including Wetlands[40]	
Authority	**Provisions and Requirements**
Clean Water Act (1972)	• Protects quality of waters of the United States, including wetlands; • Requires a permit for discharge of dredge or fill material to waters of the United States (section 404); • Requires state certification for section 404 permits (section 401).
Federal Guidelines (40 CFR Part 230; 1980, 2008)	• Prohibits discharge of dredged or fill material if there is a practicable alternative that has less adverse impact on the aquatic environment and does not have other significant adverse environmental consequences; • Requires consideration of practicable alternatives, which include activities that do not involve discharge of dredged or fill material into waters of the United States, or activities that discharge at other locations in waters of the United States; • Defines alternative as practicable if it is available and capable of being done considering cost, existing technology, and logistics in light of overall project purposes; • Prohibits discharges that will cause or contribute to significant degradation of the waters of the United States; • Prohibits violation of state water quality standards, toxicity standards, endangered species protection, or requirements designed to protect federally designated marine sanctuaries; • Requires consideration of cumulative and secondary effects on aquatic ecosystem; and • Additional projection for "special aquatic sites" defined as including wetlands, mudflats, vegetated shallows, and riffle and pool complexes.
Corps/USEPA Compensatory Mitigation Rule (April 10, 2008)	• Specifies requirements for mitigation when impacts are unavoidable; these requirements have been added to the federal Guidelines; and • Rule was adopted as Subpart J in the federal Guidelines.
MOU between Dept. of Army and USEPA on the Determination of Mitigation under the federal Guidelines (1990)	• Provides guidance for USEPA and the Corps in use of discretion in implementing federal Guidelines in standard permits; and • Sets policy of "avoid, minimize, compensate" sequence for impacts to wetlands.
Corps Standard Operating	• Guidance for the Corps in issuing permits.

[40] The table does not include all federal regulations that address or provide protection to wetlands.

Procedures (2009)	
Corps Regulatory Guidance Letters	• System for written guidance from the Corps to field agencies to clarify or interpret existing policy, judicial decisions or federal regulations.
Decision in *Solid Waste Agency of Northern Cook County v. Corps* (2001)	• Certain "isolated" waters, including wetland and riparian areas, do not fall under Corps jurisdiction.
Decisions in *Rapanos v. United States* and *Carabell v. United States* (2006)	• Two definitions for waters of the United States: (1) the CWA covers "relatively permanent, standing, or continuously flowing bodies of water" that are connected to traditional navigable waters, as well as wetlands with a continuous surface connection to such water bodies and (2) the CWA covers wetlands that "possess a 'significant nexus' to waters that are or were navigable in fact or that could reasonably be so made."
USEPA proposed rule and guidance clarifying definition of Waters of the United States. (2015) **(Currently in Litigation and Stayed)**	• Waters of the United States include traditional navigable waters, interstate waters, wetlands adjacent to either traditional navigable waters or interstate waters, non-navigable tributaries to traditional navigable waters that are relatively permanent, and wetlands that directly abut relatively permanent waters; and •
Corps Wetlands Delineation Manual (1987)	• General methods for delineating wetlands.
Regional Wetland Delineation Supplements: Arid West Region (2008) and Western Mountains, Valleys, and Coast Region (2010)	• Identifies California-specific plants, hydric soils, and wetland hydrology indicators for the Arid West Region; and • Identifies California-specific plants, hydric soils, and wetland hydrology indicators for the Western Mountains, Valleys, and Coast Region.

Table 5-2: State Regulatory Framework for Permitting Discharges of Dredged or Fill Material Into Waters of the State, Including Some Wetlands[41]

Authority	**Provisions and Requirements**
California Code of Regulations Title 23	• Requires any person discharging waste, or proposing to discharge waste, within any region that could affect the waters of the state to file a report of waste discharge (application for WDRs).

[41] The exhibit does not include all state regulations that address or provide protection to wetlands.

California Coastal Act (1976)	• Coastal permits from the California Coastal Commission (CCC) are required for all new development proposed on tide and submerged lands, and other public trust lands; • Requires coastal development permit from CCC for development within a wetland located in the coastal zone (defined as lands within the coastal zone that may be covered periodically or permanently with shallow water and include saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, or fens); and • The CCC reviews all section 404 permits for activities affecting the coastal zone to ensure consistency with the federally approved California Coastal Management Program.
California Wetlands Conservation Policy (1993)	• Establishes goal of ensuring no overall net loss of wetlands and achieving a long-term gain in the quantity, quality, and permanence of wetlands acreage and values.
State Water Board Water Quality Order No. 2004-004 DWQ (2004)	• Requires applicants to avoid, minimize, and then mitigate for adverse impacts to wetlands; • Requires mitigation for unavoidable impacts; monitoring and reporting; and • General WDRs for dredged or fill discharges of less than 0.2 acre, 400 linear feet, or 50 cubic yards to waters of the state that are not waters of the United States.
State Water Board 401 Water Quality Certification for Corps NWPs (2012)	• Certifies NWPs 1, 4, 5, 6, 9, 10, 11, 12, 20, 22, 28, 32, and 36 and finds that these activities are exempt from review under CEQA.
State Water Board 401 Certifications for other Corps General Permits	• Certifies other activities, such as small habitat restoration, invasive exotic plant removal, Corps regional general permits for emergency projects, and in the Lahontan Region, small construction projects outside the Lake Tahoe area.
CDFW Lake and Streambed Alteration Program (section1600 – 1616 of the Fish and Game Code)	• Requires notification for activities that substantially divert or obstruct the natural flow of any river, stream, or lake; change or use material from the bed, channel, or bank of, any river, stream, or lake; or deposit or disposal of debris, waste, or other material containing crumbled, flaked, or ground pavement where it may pass into any river, stream, or lake; and • Requires a Lake and Streambed Alteration Agreement for activities that may affect fish and wildlife resources.
Local Coastal Plan (LCP) Certification and Amendments	• Directs each of the 73 cities and counties lying wholly or partly within the coastal zone to prepare an LCP; and • Requires local jurisdictions containing wetlands to include regulatory policies in their LCPs to ensure consistency with the Coastal Act.

Federal and State Regulatory Framework for Dredged or Fill Discharges under General Orders

General permits issued by the Corps address specific classes of dredged or fill activities that are similar in nature and/or involve the same or similar types of adverse effects. The purpose of these general permits is to simplify the project review and approval process for both the Corps and the applicant, thereby streamlining the permitting process. Regional General Permits cover a specific geographic area, such as a watershed, city or district. The Corps also issues Nationwide general permits every five years to cover dredged or fill activities that are similar and/or involve the same or similar types of discharges and possible adverse impacts to water quality, such as linear transportation crossings, bank stabilization activities, and aquatic habitat restoration, establishment, and enhancement projects.

To comply with Corps general permits, an applicant need only qualify for the permit since the general permit is already issued, and, for most permits, notify the Corps either before or after initiating dredge or fill activities into water of the U.S. (notification is not required for select permits). In effect, the Corps satisfies all project review requirements under the federal Guidelines for the applicant, including the requirement to submit an alternatives analysis to identify the LEDPA.

The Water Boards have issued some 401 certifications for general permits issued by the Corps, while others have been denied certification, necessitating that those activities receive individual review at the state level. Examples of 401 certifications issued by the Water Boards are regional general permits for emergency projects and some classes of Nationwide permits that are exempt from review under CEQA. If an applicant believes a project qualifies to enroll under a 401 certification already issued by the Water Boards, the applicant need only file a Notice of Intent (NOI) for review by the Water Boards. In all other instances, the project proponent would submit an application for an individual Order.

5.2 Overview of the Water Boards' Dredged or Fill Program

Through the Water Boards, a number of different classes of projects are regulated under the dredged or fill program. Types of projects and activities that are certified and regulated through the program include deep water dredging, flood control maintenance projects, sand and gravel extraction, fill and excavation for development projects, compensatory mitigation projects, and ecological restoration and enhancement projects. Below is a description and summary of different types of projects that includes data from the California Integrated Water Quality System (CIWQS) for fiscal year 14-15 (July 1, 2014 through June 30, 2015). Data and information displayed here is representative of a typical year of regulation for the program.

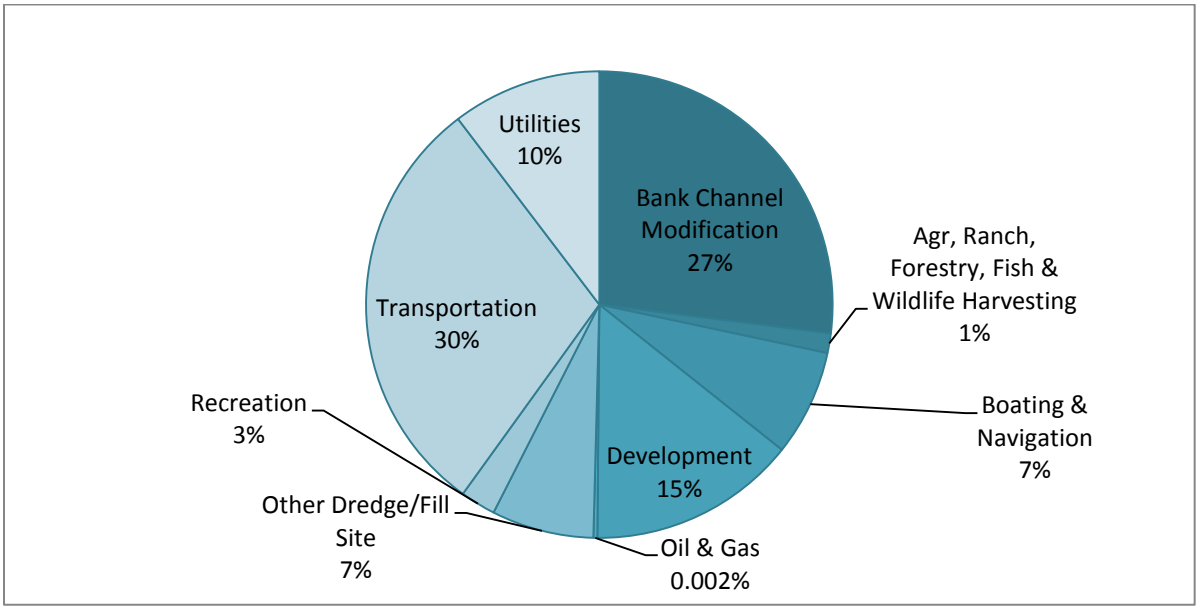
Fill & Excavation Projects

Fill and excavation projects represent the largest portion of projects that are regulated through the program. In fiscal year 14-15, the Waters Boards issued 734 Orders for Fill & Excavation Projects, representing 82 percent of projects certified through the program. As described in section 5.1, fill material is material that can replace any portion of waters with dry land or changes the bottom elevation of waters. In contrast, excavation is the removal of sediment or soil in shallow waters. Figure 1 displays a comparison of different types of fill and

excavation projects that have been certified through the program in FY 14-15. This data represents a typical year of the programs permitting for the following project types:

- Transportation Projects include roads, highways, airport facilities, bridges, overpasses, crossings, and railroads
- Bank and Channel Modification Projects include non-restoration bank stabilization, bio-engineered bank stabilization projects, beach nourishment, temporary diversion structures, dams, permanent diversion structures, channel construction and maintenance, outfall structures, and flood control and maintenance projects.
- Boating and navigation projects include construction, maintenance, modification, and removal of marina facilities, boat slips, boat ramps, moorings, piles, piers, wharves, buoys, and other navigation aids.
- Development projects include projects residential, commercial, mixed use, and industrial construction.
- Utility projects include the construction, maintenance, modification and/or removal of overhead, underground utilities, including support facilities and large integrated power developments. Utility projects also include alternative energy such as solar, wind & hydroelectric facilities.
- Agriculture, Ranch, Forestry, Fish and Wildlife Harvesting projects include agricultural conversations of use from undeveloped to agriculture, industrial ranching, irrigated lands, aquaculture projects, and silvicultural activities.
- Recreation projects includes construction, maintenance, modification, and removal or recreation facilities including campgrounds, trails, golf courses, ski facilities, and event venues.
- Oil and gas and projects include projects with the purpose of installing drilling pads, exploration, hydraulic fracturing, and production wells.
- Other Dredged or Fill sites include projects for the installation of data collection devices to measure and record scientific data or for survey activities. This category also includes projects with the purpose of cleanup of hazardous or toxic waste or projects that do not fit in any other category.

Figure 1: Fill & Excavation Projects by Project Type



Impacts from Fill & Excavation Projects

Table 5-2 displays the total quantity of impacts for projects that have been certified by the Water Boards in fiscal year 14-15 and is representative of a typical year. This table displays the impact quantity by water body type. Impact types are defined as follows:

- *Temporary impacts* are impacts that temporarily cause a physical loss or ecological degradation of an aquatic resource. The impact must be restored to pre-project condition through natural ecological processes or active restoration in order to be classified as temporary. If the impact is not restored to pre-project condition, it is classified as permanent.
- *Permanent impacts* will permanently change an aquatic resource to a non-aquatic habitat type or permanently changes the bottom elevation of an aquatic resource. Permanent impacts can result in physical loss of area and ecological degradation.

Table 5-2: Fill & Excavation Impacts in FY 14-15[42]

Aquatic Resource Type	Temporary Impacts (Acres)	Permanent Impacts (Acres)
Lake	7.90	2.35
Ocean/Bay/Estuary	15.57	17.48
Riparian	15.62	8.42
Streambed	297.97	64.75
Vernal Pool	2.93	2.84

[42] This data excludes impacts from flood control and maintenance projects.

Wetland	52.67	100.92
Total	392.67	196.76

Compensatory Mitigation Required for Fill & Excavation Impacts

Compensatory mitigation means the reestablishment, establishment (creation), rehabilitation, enhancement, and in some circumstances, preservation, of aquatic resources for the purpose of offsetting unavoidable temporary and permanent adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved. Compensatory mitigation required for certified impacts quantified in Table 5-2 (above) are displayed in Table 5-3. There are five different compensatory mitigation methods and are described as follows:

- Establishment (or creation) means the manipulation of the physical, chemical, or biological characteristics present to develop an aquatic resource that did not previously exist at a site. Establishment results in a gain of aquatic resource area and function (+/+)
- Re-Establishment means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of returning natural/historic functions to a former aquatic resource. Re-establishment results in rebuilding a former aquatic resource and results in a gain in aquatic resource area and functions (+/+)
- Rehabilitation means the manipulation of the physical, chemical, or biological characteristics of a site with the goal of repairing natural/historic functions to a degraded aquatic resource. Rehabilitation results in a gain in aquatic resource function, but does not result in a gain in aquatic resource area (0/+)
- Enhancement means the manipulation of the physical, chemical, or biological characteristics of an aquatic resource to heighten, intensify, or improve a specific aquatic resource function(s). Enhancement results in the gain of selected aquatic resource functions(s), but may also lead to a decline in other aquatic resource function(s). Enhancement does not result in a gain in aquatic resource area (0/+)
- Preservation means the removal of a threat to, or preventing the decline of, aquatic resources by an action in or near those aquatic resources. This term includes activities commonly associated with the protection and maintenance of aquatic resources through the implementation of appropriate legal and physical mechanisms. Preservation does not result in the gain of aquatic resource area or function(s) (0/0)
- Unknown Compensatory Mitigation methods represent compensatory mitigation that is unknown at the time of certification. The compensatory mitigation method would be unknown at the time of certification when the approved mitigation is through an in-Lieu fee program that has not yet financed a project for that area.

Compensatory mitigation type is the manner in which the permittee will carry out the compensatory mitigation that is required for unavoidable adverse impacts associated with the project. Compensatory mitigation types are defined as follows:

- Mitigation banks are aquatic resource areas that have been restored, established, enhanced, or in certain circumstances, preserved for the purpose of providing compensation for impacts to aquatic resources in the form of mitigation credits. Aquatic resources areas are restored, established or enhanced in advance of credits being made available for purchase.
- In-Lieu Fee Programs are mitigation instruments which operate by making mitigation credits available for purchase to compensate for impacts to aquatic resources through an in-lieu-fee sponsor. Fees collected from the purchase of mitigation credits are used for the restoration, establishment, and/or enhancement of aquatic resource areas, in the same service area as the impacts once enough funds have been collected to finance a project in that area.
- Permittee responsible is mitigation which is carried out by the discharger. Permittee responsible mitigation can be carried out at the same location as the impacts (on-site) or carried out at a different location (off-site).
- Unknown Compensatory Mitigation types represent compensatory mitigation that is unknown at the time of certification.

Table 5-3: Compensatory mitigation required for certified impacts in FY 14-15

Aquatic Resource Type	Compensatory mitigation Type	Compensatory Mitigation Method					
		Established	Reestablished	Rehabilitated	Enhanced	Preserved	Unknown
Lake	Mitigation Bank	0.00	0.00	0.00	0.00	0.00	0.00
	In-Lieu	0.00	0.00	0.00	0.02	0.00	0.00
	Permittee Responsible	2.38	0.00	9.27	3.86	0.00	0.00
Ocean/Bay/ Estuary	In-Lieu	0.00	0.00	0.00	0.16	0.00	0.00
	Permittee Responsible	0.50	5.76	1.30	11.09	0.00	0.00
Riparian	Mitigation Bank	0.22	1.78	0.12	5.52	0.00	0.00
	In-Lieu	0.00	0.78	0.87	0.00	0.00	0.00
	Permittee Responsible	9.08	6.55	15.92	11.26	4.71	2.67
Streambed	Mitigation Bank	0.79	0.93	1.00	5.27	1.08	0.22
	In-Lieu	4.25	0.86	2.16	3.22	0.04	0.69
	Permittee Responsible	8.29	3.24	36.24	12.11	5.45	0.00
Unknown	In-Lieu	0.00	0.00	0.00	0.00	0.42	0.00

	Permittee Responsible	0.77	1.28	0.00	0.00	0.00	0.00
Vernal Pool	Mitigation Bank	5.47	0.00	0.11	0.13	13.98	0.00
	In-Lieu	0.00	0.00	0.03	0.00	0.00	0.00
	Permittee Responsible	0.41	0.00	2.90	0.00	0.00	0.00
Wetland	Mitigation Bank	14.53	3.32	0.83	32.10	4.80	9.05
	In-Lieu	14.71	0.64	0.20	0.06	0.00	0.68
	Permittee Responsible	44.16	19.28	33.24	12.48	82.10	0.00

Dredging Projects

Dredging projects are carried out with the purpose of removing sediment in deeper water to increase depth. In FY 14-15, the Water Boards' program certified 50 dredging projects with the approximate cumulative total of 2,876,624 cubic yards of sediment reported to be removed from waters of the state. This is representative of a typical year of dredging activity. Examples of dredging projects certified through the Water Boards' program include maintenance dredging programs in which dischargers remove sediment regularly. These projects report to the Regional Boards on an annual basis the amount of sediment that is removed, as well as to the status of monitoring and mitigation conditions, if any.

Ecological Restoration and Enhancement Projects

Ecological restoration and enhancement projects (Restoration Projects) are projects that are undertaken with the sole purpose of assisting or controlling the recovery of an aquatic ecosystem that has been degraded, damaged or destroyed to restore some measures of its natural condition and to enhance the beneficial uses of potential beneficial uses of waters of the state. Restoration Projects are undertaken voluntarily in accordance with the terms and conditions of a binding stream or wetland enhancement or restoration agreement, or a wetland establishment agreement. In FY 14-15, the Water Board program certified 84 Restoration Projects across the state. These types of projects are carried out for a number of reasons such as, to improve or create habitat for threatened and/or endangered species, improve spawning habitat for salmonids, or facilitate passage for anadromous fish (to name a few). For example, each year the State Water Board certifies restoration projects for the Fisheries Restoration Grant Program[43]. This program is funded by the California Department of Fish and Wildlife to restore and enhance fish habitat in California.

[43] https://www.wildlife.ca.gov/Grants/FRGP

Compensatory Mitigation Project Type

This project type includes projects that establish mitigation banks, in-lieu fee programs and permittee-responsible mitigation (located outside of the originally permitted discharge site). It includes projects that reestablish, establish (create), rehabilitate, enhance, and in some circumstances, preserve, aquatic resources for the purposes of providing compensatory mitigation. Mitigation credits are purchased by permittees from mitigation banks and in-lieu fee programs approved by the Corps to satisfy compensatory mitigation requirements for adverse impacts to aquatic resources. Whereas mitigation bank project activity is confined to one location, in-lieu fee programs sponsor restoration activities in a designated service areas, carrying out individual projects once sufficient funds have been collected through the sale of credits. The compensatory mitigation project type also includes permittee responsible compensatory mitigation to satisfy the compensatory mitigation requirements for a project permitted separately in a different location. In FY 14-15, the Water Board program certified nine Compensatory mitigation projects which include four mitigation banks, four permittee responsible projects, and one in-lieu fee project.

Wetland Importance and Trends

Due to the numerous functions and services wetlands provide, these areas are among the world's most important ecosystems. These functions and services include the provision of habitat and conservation of biodiversity, recreational opportunities (such as hunting, fishing, wildlife viewing, and others), water supply, floodplain protection, water quality maintenance and purification, carbon sequestration, erosion control, oxygen provision, nutrient cycling, and many others. Of course, not all wetlands provide all of these functions; the set of functions provided by a particular wetland is highly site-and water body-specific.

The Water Education Fund (WEF, 2000) provides an overview of the major values of wetlands to California.[44] Wetlands are essential to maintaining water quality, as pollutants that would otherwise degrade groundwater and surface waters are routinely filtered by wetland vegetation. The wetland areas of the San Francisco Bay and San Joaquin Delta Estuary are key components of the waterway complex that provides two thirds of the drinking water for the state. Wetlands also provide flood control, mitigating potentially serious impacts on downstream resources by temporarily storing flood waters and detaining water flow. By stabilizing the banks of waterbodies and coastal areas they border, wetlands are also vital erosion control and shoreline stabilization mechanisms. In addition, these ecosystems are important for recharging aquifers.

As noted by California Natural Resource Agency (2010), wetlands are a blend of terrestrial and aquatic characteristics, which provide diverse habitats and serve as critical nursery areas for many birds, fish, and invertebrates. As such, habitat provision is another key function of wetlands. The $110 billion fishing industry in the state is heavily reliant on wetlands, which are the spawning and nursery habitats that sustain many freshwater and marine fisheries (WEF, 2000).

[44] This discussion is not a comprehensive evaluation of wetland functions and services. For more information on wetlands and their benefits, see USEPA (2001a) and California Natural Resources Agency (1998; 2010).

The Humboldt Bay tidal lands, for example, produce 90% of all oysters harvested in California. Beyond sustaining these and other economically valuable species, wetlands support 55 percent of endangered animal and 25 percent of endangered plant species in California. Taken together, wetlands in California support more species of plants and animals than any other habitat type in the state (California Natural Resource Agency, 2010). The Central Valley, home to a large share of the remaining wetlands in the state, is the most important waterfowl wintering area in the Pacific Flyway, supporting 60 percent of the total wintering population (WEF, 2000; California Natural Resource Agency, 2010).

Due to these and other functions, wetlands are fundamental to the economic health of the state. Although accurate economic valuations of these diverse ecosystems are difficult to produce, South Bay Restoration (n.d.) has estimated the annual recreational value of wetlands in California at between 6.3 and 22.9 billon dollars. However, recreational value is a significant underestimate of the total economic benefit, because it does not include the value of the myriad of other functions wetlands provide, such as water filtration, flood control, wildlife habitat, carbon sequestration, and others.

National Wetland Trends

Despite the valuable functions and services provided by wetlands, the nation and the state of California have sustained substantial wetland losses over time, primarily due to conversion of wetland areas to other uses. USEPA (2001b) estimates that over 220 million acres of wetlands originally existed in the conterminous United States. Today, over half of those original wetlands have been lost. The USFWS (2011) estimates that there are approximately 110.1 million acres of wetlands within the conterminous United States (as of 2009).

USFWS (2011) began systematically monitoring wetlands in the early 1970s, when wetland loss in the United States averaged approximately 458,000 acres annually. Since then, wetland losses have slowed; in the mid-1970s to the mid-1980s, losses were approximately 290,000 per year, and by 1998, they were about 59,000 per year. The period between 1998 and 2004 saw the first net wetlands gain of approximately 32,000 acres per year.

However, the most recent data documented by USFWS (2011) indicate a reversal of this gain. Approximately 13,800 acres of wetlands were lost in the conterminous United States between 2004 and 2009. Gains in some wetland types (via compensatory mitigation) were offset by losses in others. For example, over 489,000 acres of forested wetlands were lost during the 4.5-year period, while gains in freshwater ponds were considerable.

On May 11, 2016 the U.S. EPA released the *National Wetland Condition Assessment, 2011* (NWCA).[45] The NWCA is a collaborative survey the evaluation of the ecological condition of wetlands in the United States. The survey assessed vegetation, soil, hydrology, chemistry, algae, and buffer metrics at tidal and non-tidal wetlands. Survey results found that 48 percent of the country's wetlands are in good condition, while 20 percent are fair and 32 percent are in poor condition. Of the national totals, 146 randomly selected sites were assessed in the Western United States which represents the condition or 3,647,060 acres of wetlands. Of this subset it was found that 21 percent of wetlands were in good condition, 18 percent fair, and 43 percent in poor condition. It was observed

[45] https://www.epa.gov/national-aquatic-resource-surveys/national-wetland-condition-assessment-2011-results

that major indicators of stress in the west are ditching, damming, nonnative vegetation, surface hardening, and vegetation removal (U.S. EPA, 2016).

California Wetland Trends

Relative to the rest of the nation, especially profound historical wetland losses have occurred in California. Over 90 percent of the wetlands that existed at the time of European settlement are now gone (California Natural Resources Agency, 2010) – a higher rate of loss than any other state. Most wetland destruction has been the result of conversion of wetland areas to agriculture or urban uses. Central Valley wetlands are an example of this conversion (California Natural Resources Agency, 2010). The Central Valley originally contained over 4 million acres of wetlands, or over 30 percent of the total 13 million acres in the region. However, since the mid-1800s, over 95 percent of these wetlands have been destroyed. Today, just over 205,000 acres of wetlands remain in the region, and two-thirds of them are under private ownership. **Error! Reference source not found.** (Dahl and Allord, 1997) shows this historical loss.

As with the rest of the nation, wetland loss in California has slowed in recent years; between January 2007 and April 2009, the Corps recorded an annual rate of 300 to 400 acres of wetlands and other jurisdictional aquatic habitat losses in the state. Primary causes of these recent wetland losses are land cover change, hydrological modification, biological invasion (i.e., invasive species), pollution, and climate change (California Natural Resources Agency, 2010).

Today, there are approximately 2.9 million acres of wetlands in California (California Natural Resources Agency, 2010). Of those, 38 percent are concentrated in the San Francisco Bay Delta and Central Valley regions, while another 36 percent are in the Sierra and Modoc regions, and 26 percent are in the North, Central, and South Coasts and the Colorado and Mojave Deserts. The majority of wetlands in the state (60 percent) are freshwater vernal pools, marshes, wet meadows, fens, playas, seeps and springs, bogs, swamps, and shallow ponds. Lakes are associated with 25 percent, and 15 percent are associated with river channels, intertidal beaches, rocky shorelines, and estuaries (California Natural Resources Agency, 2010).

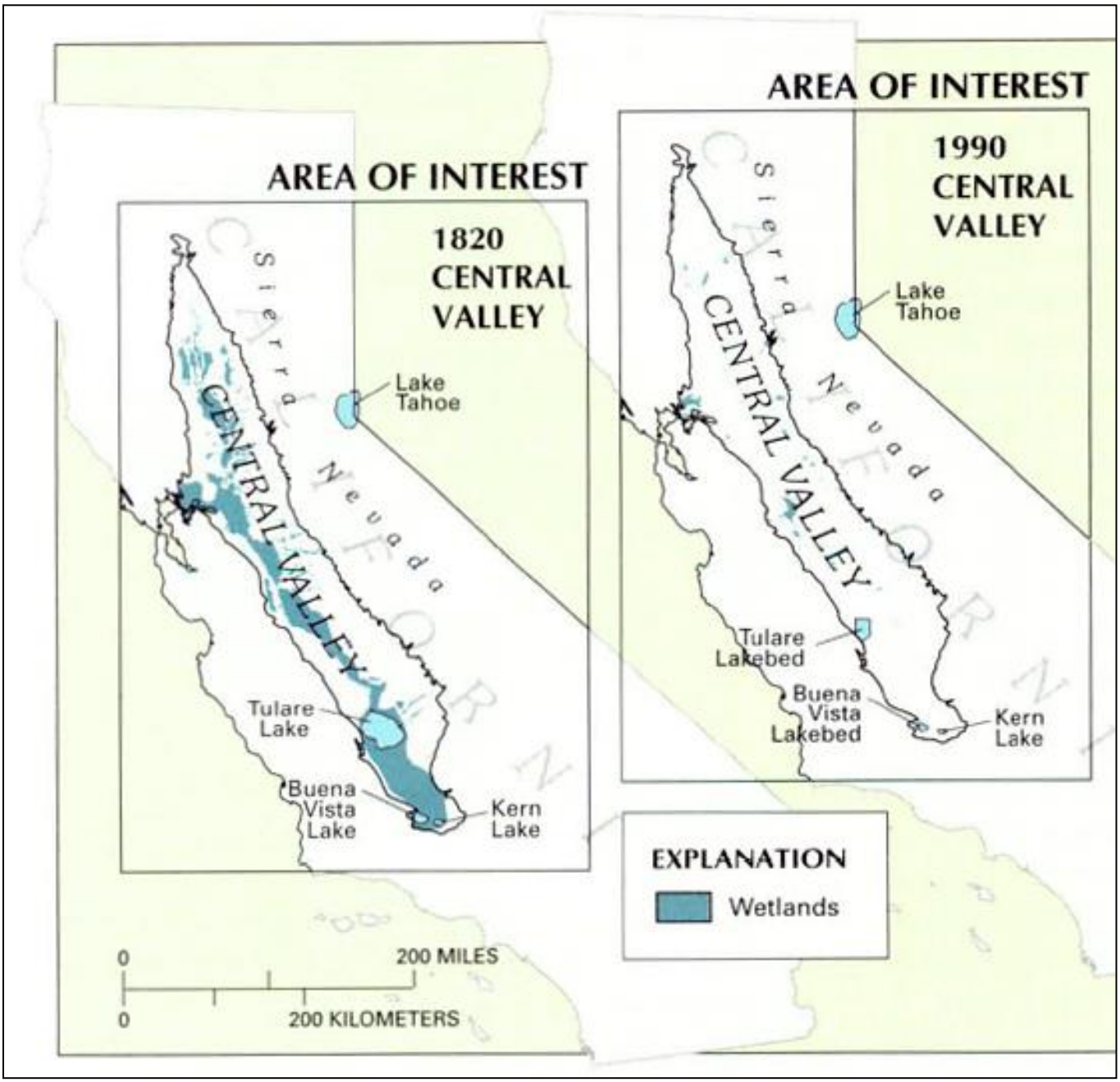


Figure 2. Wetlands of the Central Valley of California, circa 1820 (left) and 1990 (right) (Dahl and Allord, 1997)

Impact of Compensatory Mitigation

The practice of compensatory mitigation[46] has significantly contributed to the reported decreasing rates of net wetland loss over recent decades. However, estimates of wetland losses may provide an overly optimistic picture if compensatory mitigation wetlands are not ecologically equivalent to the natural wetlands they are intended to replace. For example, the USFWS (2011) points out that, although there have been net wetland gains in recent years, there is a "non-parity between wetland types that have been lost and subsequent wetland mitigation…the net effect has been the loss of wetland diversity, hydrologic function, biological communities, and a 'homogenization of wetland landscapes.'"

Wetlands such as freshwater emergent and open water ponds have been preferentially established as mitigation wetlands, with an area of deeper open water surrounded by shallow water and a band of emergent vegetation being the most common hydrologic pattern. Meanwhile, replacement of ecosystems such as forested wetlands has substantially lagged behind, despite sustaining significantly higher losses (Kihslinger, 2008; USFWS, 2011). As such, many compensatory mitigation wetlands may not sufficiently replace the functions of lost natural wetlands, and estimates of net acreage gains and losses are not fully reflective of the true losses and gains in the nation's wetlands.

This trend is also apparent in California. Table -4 summarizes the extent of compensatory mitigation in California from 2004 to 2009. Ambrose et al. (2007) conducted a study of compensatory mitigation wetlands throughout the state, and found that, although they are largely meeting their permit requirements in terms of area and/or establishment of wetland vegetation, most sites do not achieve stated ecological performance goals. The authors visited 129 sites with compensatory mitigation permits, and assessed them according to CRAM, which includes evaluations of 1) buffer and landscape context, 2) hydrology, 3) physical structure, and 4) biotic structure.

According to these criteria, the average mitigation site scored a 59 percent or "suboptimal" score (where a score of 70 to 100 percent represents an "optimal" wetland). Only 19 percent of the mitigation wetlands were ecologically successful, and 27 percent did not meet the federal definition of wetlands. Given these results, the authors conclude that "it seems likely that many mitigation projects did not replace the functions lost when wetlands were impacted, and hence the goal of 'no net loss' of wetland functions was not met," and that "this is partly due to regulatory agencies approving mitigation projects with conditions or criteria that are too heavily focused on the vegetation component of wetland function, with inadequate emphasis on hydrological and biogeochemical conditions and their associated functions and services."

[46] Whereby project developers use wetland establishment, restoration, enhancement, or preservation to offset losses to wetlands, as required by §401 certifications and/or WDRs).

Table 5-4. Summary of Dredged or Fill and Compensatory Mitigation Acreage in California for Years 2004 - 2009

Year	# of Dredged or Fill Orders	Thousands Cubic Yards Dredged Material	Permanent Fill Acres	Compensatory Mitigation Acres
2004	1,244	2,711	500	**960**
2005	1,197	3,513	600	**1,426**
2006	1, 094	3,548	588	**1,729**
2007	918	1,742	479	**1,873**
2008	802	4,380	602	**1059**
2009	799	2,198	1,683	**U**

U = Uncertain (data unavailable)
Source: CWA §401 Water Quality Certification Program, Division of Water Quality, Annual Reports, (http://www.waterboards.ca.gov/water_issues/programs/cwa401/#reports), for years 2004 - 2008. Information obtained from California Integrated Water Quality System (CIWQS) for year 2009.

Stressors to Existing Wetlands

In addition to historic and continued losses of natural wetlands and insufficient compensatory mitigation, many of the remaining wetlands in California are subject to a wide variety of potential stressors. These stressors can include habitat fragmentation, altered hydrology and flood control structures, reduced water supply, altered sediment transport and organic matter loading, physical barriers to movement of water, sediment, dredging, filling, diking, and ditching, shoreline hardening, engineered channels, beds, and banks, human land uses in wetland buffers, toxic contaminations, nutrient over-enrichment, pathogenic bacteria, invasive plants and animals, excessive human visitation, predation from feral animals and domestic pets, compaction and trampling by livestock, and removal of vegetation. According to the California Natural Resources Agency (2010), "a fundamental challenge facing entities entrusted with protecting wetlands in the state is the lack of an integrated, comprehensive wetland monitoring and assessment program and the associated data management infrastructure to support it."

5.3 Regional Board Basin Plan Provisions Regarding Wetlands

As shown in Table , a number of the Regional Water Boards, including the North Coast and San Francisco Bay Regions, reference the USEPA and Corps wetland definition and/or the Corps 1987 Manual in their basin plans. Outside of the CWA section 401 program, however, basin plans generally acknowledge that more flexible wetland identification criteria may be needed to protect wetlands that qualify as waters of the state. For example, the San Francisco Bay Basin Water Quality Control Plan (Basin Plan) notes that:

> "Identifying wetlands may be complicated by such factors as the seasonality of rainfall in the Region. Therefore, in identifying wetlands considered waters of the United States, the [Regional] Water Board will consider such indicators as hydrology, hydrophytic plants, and/or hydric soils for the purpose of mapping and inventorying wetlands (Basin Plan section 2.2.3; emphasis added)."

Despite a somewhat broader recognition of wetlands shown in Table , and discussed in more detail below, the Regional Water Boards do not have specific wetland definitions nor regional delineation standards for wetland identification.

Table 5-5: Wetland Definitions/Procedures and Wetland Beneficial Uses Contained in Regional Water Quality Control Board Basin Plans as of September 2012

Regional Water Board	**Wetland Definition**	**Delineation Procedures**	**Beneficial Uses (BUs) and/or Water Quality Objectives for Wetlands**
North Coast (Chapter 2.17-2.18)	Relies on the federal wetland definition to generally define wetlands. Identifies other wetlands based on judgment of the Regional Board.	Relies on Corps delineation manuals to identify wetland boundaries. If USEPA disagrees with Corps' determination, will rely on USEPA determination.	Establishes the following wetland BUs: Wetland Habitat; Flood Peak Attenuation/Flood Water Storage; Water Quality Enhancement; assigns other surface water BUs to wetlands.
San Francisco Bay (Chapters 2.2.3 & 4.23.2)	Relies on the federal wetland definition to generally define wetlands. Identifies other wetlands based on the presence of wetland hydrology, hydric soils, and/or hydrophytic vegetation. Provides a list of wetland types including mudflats.	Relies on USEPA and Corps delineation procedures for CWA section 401. Relies on USEPA or CDFW delineations when USEPA disagrees with Corps' determination.	Assigns a number of BUs to wetlands including Wildlife Habitat.
Central Coast	None specified.	None specified.	None specified.
Los Angeles (Chapter 2.4 and 3.17)	Relies on Saint, et al. (1993) as an inventory and description of major regional wetlands. Freshwater, estuarine, and saltwater marshes, swamps, mudflats, and	None specified.	Establishes the following wetland BUs: Wetland Habitat; assigns other surface water BUs to wetlands. Establishes two water quality objectives for the protection of wetlands: Wetland Hydrology

	riparian areas are specifically identified as wetlands. Identifies other wetlands based on the presence of wetland hydrology, hydric soils, and/or hydrophytic vegetation.		and Wetland Habitat.
Central Valley (Chapter 2)	None specified.	None specified.	Identifies the following wetland BUs: Wildlife Habitat; assigns other surface water BUs to wetlands; BUs in the Delta assigned on a case by case basis.
Lahontan (Chapter 2.1, 2.5 and 4.9-8)	Relies on the federal wetland definition to generally define wetlands. Uses primary and secondary indicators of hydrology, vegetation, and soils to identify "Stream Environment Zones" (includes wetlands and riparian areas; Lake Tahoe Basin only).	Provides a wetlands protection and management implementation plan. Determines site-specific boundaries of wetland areas on an as-needed basis using methods in the current federal Wetlands Delineation Manual (Corps, 1987).	Establishes the following wetland BUs: Flood Peak Attenuation/Flood Water Storage and Water Quality Enhancement (applies to all surface waters, but only assigned to wetlands currently); assigns other surface water BUs to wetland waterbodies via the tributary rule. Establishes a narrative wetland water quality objective for Nondegradation of Aquatic Communities and Populations; assigns other surface water quality objectives to wetlands but notes that a case by case determination may be needed where the water quality objective is naturally out of range.
Colorado River	None specified	None specified.	None specified.
Santa Ana (Chapter 3.4-	Identifies wetland types: swamps, marshes, bogs,	Uses the Corps' wetland definition as general	Assigns BUs to a partial listing of wetlands in the Basin Plan; not

3.5)	sloughs, mangroves, wet meadows, savannas, wet tundra, playa lakes and vernal pools.	reference only. Specific boundaries of each wetland area are determined on an as-needed basis using the federal Wetland Delineation Manual (Corps 1987) or other accepted techniques.	all wetlands in the Region have been identified by the Regional Board to date.
San Diego	None specified.	None specified.	None specified.

North Coast Regional Water Quality Control Board

The North Coast Regional Water Quality Control Board Basin Plan

(2011) (Basin Plan) refers to the definition of wetlands found in federal regulations, which is "those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas (40 CFR 116.3)."

The Basin Plan also acknowledges that state wetland requirements under the Water Code can differ from the CWA and federal regulations. The Basin Plan states that the "definition of Waters of the state is broader than the definition of Waters of the United States" and that under state law "wetlands are waters of the state and wetland water quality control is within the jurisdiction of the state and Regional Boards independent of federal law, and need not meet federal jurisdictional requirements under the CWA to trigger regulatory controls (Basin Plan 2011, p 2-16)." The North Coast Region recognizes wetlands as a broad category of waters of the state, in addition to other categories such as bays, estuaries, ocean waters, and groundwater. The North Coast Region protects three beneficial use categories for wetlands in its Basin Plan:

- *Water Quality Enhancement:* Uses of waters, including wetlands and other waterbodies, that support natural enhancement or improvement of water quality in or downstream of a waterbody including, but not limited to, erosion control, filtration and purification of naturally occurring water pollutants, streambank stabilization, maintenance of channel integrity, and siltation control;
- *Flood Peak Attenuation/Flood Water Storage*: Uses of riparian wetlands in flood plain areas and other wetlands that receive natural surface; and
- *Wetland Habitat:* Uses of water that support natural and man-made wetland ecosystems, including, but not limited to, preservation or enhancement of unique wetland functions, vegetation, fish, shellfish, invertebrates, insects, and wildlife habitat.

The Basin Plan further states:

- The regional board recognizes that wetlands are frequently referred to under the following names (or classifications): saltwater marshes, freshwater marshes, open or closed brackish water marshes, swamps, mudflats, sandflats, un-vegetated seasonal ponded areas, vegetated shallows, sloughs, wet meadows, fens, playa lakes, natural ponds, vernal pools, diked baylands, seasonal wetlands, and riparian woodlands; and
- In general, the Regional Water Board relies on the federal *Wetlands Delineation Manual* (Corps 1987) for determining wetland areas subject to the CWA. In the rare cases where the USEPA and Corps Guidelines disagree, the Regional Water Board relies on the wetlands delineation made by USEPA.

The North Coast Region states in its Basin Plan that staff will "prepare and implement a plan to identify and delineate wetlands with the Region when funding becomes available." The Region admits that it may not be practical to delineate and specify beneficial uses for every wetland area because there are a large number of small and contiguous wetlands and those wetlands and their beneficial uses may continue to be determined on a site-specific basis, as necessary.

The North Coast Region describes Constructed Treatment Wetlands as wetlands built and managed to provide wastewater or storm water treatment in order to achieve protection or improvement in receiving water quality, that can have additional benefits such as supporting waterfowl, and providing opportunities for education and recreation. The Region does not consider Constructed Treatment Wetlands mitigation for projects that impact naturally-occurring wetlands.

Finally, wetlands are addressed in several of the Region's implementation plans. In the "Action Plan for the Garcia River Watershed Sediment TMDL," wetlands are specifically mentioned in the land management measures that apply to floodplain gravel mining in the Garcia River watershed. It is noted that the maximum depth of floodplain gravel extraction should remain above the channel thalweg, and that shallow excavations (above the water table) would provide depressions that would fill with water part of the year and develop seasonal wetland habitat. In addition, it is noted that side slopes of floodplain excavations should range from 3:1 to 10:1, which would allow for a range of vegetation from wetland to upland. Also, it is noted that floodplain pits should be restored to wetland habitat or reclaimed to agriculture.

San Francisco Bay Regional Water Quality Control Board

The San Francisco Bay Regional Water Quality Control Board includes wetlands as one of the types of surface waters in the region and clearly recognizes its authority to regulate wetlands (Basin Plan, 2013). The Basin Plan states that wetland water quality control is "clearly within the jurisdiction of the State Water Board and Regional Water boards" because the Porter-Cologne Act defines waters of the state as "any water, surface or underground, including saline waters, within the boundaries of the State (Cal. Wat. Code§13050(e))." The Regional Board recognizes mudflats, which would fail the three-of-three wetland parameter test since they are unvegetated, as one of the most important wetland types in the San Francisco Bay Region. The Basin Plan also asserts the Regional Water Board's independent authority to regulate discharges of waste to wetlands in situations where there is a conflict with the Corps over a jurisdictional determination or in instances where the Corps may not have jurisdiction.

The San Francisco Regional Basin Plan lists many beneficial uses of wetlands: Wildlife Habitat; Preservation of Rare and Endangered Species; Shellfish Harvesting; Water Contact Recreation; Noncontact Water Recreation; Ocean, Commercial, and sport Fishing; Marine Habitat; Fish Migration; Fish Spawning; Estuarine Habitat; and Groundwater Recharge. In addition to these beneficial uses, the Basin Plan recognizes that wetlands that provide groundwater recharge also provide flood control, pollution control, erosion control, and stream baseflow. The Basin Plan identifies 34 significant wetland areas within the Region, although the Basin Plan states that the list is not comprehensive. Most of the identified wetlands in the Basin Plan are saltwater marshes.

The Basin Plan indicates that the San Francisco Bay Regional Water Quality Control Board has participated in several efforts to provide guidance on wetland restoration. The Region participated in the Baylands Ecosystem Habitat Goals Report (1999) and the Baylands Ecosystem Species and Community Profiles (2000). The Region has also assisted efforts to identify wetland sites, such as the SFEI's EcoAtlas Baylands Maps and Bay Area Wetlands Project Tracker.

The San Francisco Bay Basin Plan identifies "wetland protection and management" as one of the general categories of the watershed management framework for regulating water quality. In terms of identifying and delineating wetlands, the San Francisco Bay Regional Water Quality Control Board states in its Basin Plan that:

> The [Regional] Water Board will, in general, rely on the federal manual for wetland delineation in the Region when issuing Clean Water Act §401 water quality certifications (US Army Corps of Engineers (Corps) Wetlands Delineation Manual 1987) (Basin Plan for the San Francisco Bay Region section 2.2.3).

The San Francisco Bay Basin Plan also notes that:

> Identifying wetlands may be complicated by such factors as the seasonality of rainfall in the Region. Therefore, in identifying wetlands considered waters of the United States, the [Regional] Water Board will consider such indicators as hydrology, hydrophytic plants, <u>and/or</u> hydric soils for the purpose of mapping and inventorying wetlands (Basin Plan for the San Francisco Bay Region section 2.2.3).

The San Francisco Regional Water Quality Control Board Basin Plan requires that the following be considered when permitting or otherwise acting on wetland issues:

- Governor's Executive Order W-59-93 (signed August 23, 1993; also known as the California Wetlands Conservation Policy, or the "No Net Loss" policy);
- California State Senate Concurrent Resolution No. 28 that states, "It is the intent of the legislature to preserve, protect, restore, and enhance California's wetlands and the multiple resources which depend on them for the benefit of the people of the State";
- Water Code §13142.5 (applies to coastal marine wetlands) that states: "Highest priority shall be given to improving or eliminating discharges that adversely affect … wetlands, estuaries, and other biologically sensitive sites";
- Estuary Project's Comprehensive Conservation and Management Plan (June 1994) for recommendations on how to effectively participate in a Region-wide, multiple-agency wetlands management program;

- Two planning documents for wetland restoration for the Estuary baylands: Baylands Ecosystem Habitat Goals (1999) and Baylands Ecosystem Species and Community Profiles (2000), together known as the Habitat Goals reports. The Habitat Goals reports identify and specify the beneficial uses and/or functions of existing wetlands and suggest wetland habitat goals for the baylands;
- CWA section 401 water quality certification requirements for dredged or fill impacts to waters of the state;
- The federal Guidelines, which are incorporated by reference into the basin plan;
- 1987 Corps wetland delineation manual, and/or USEPA or CDFW wetland delineation method;
- Mapping and inventorying uses protocols and naming conventions in the NWI prepared by the USFWS;
- Order 2004-0004-DWQ, General WDRs for dredged or fill discharges to waters deemed by the Corps to be outside of federal jurisdiction; and
- The use of established wetland compliance and ecological assessment methods, such as the Wetland Ecological Assessment and the CRAM, for mitigation projects.

Central Coast Regional Water Board

This Regional Water Board states in the Water Quality Control Plan for the Central Coast Basin (Basin Plan), that it will be "developing management practices for marinas and recreational boating; hydromodification facilities; and wetlands, riparian areas, and vegetated treatment systems at a later date." In the Basin Plan, "constructed wetlands" are mentioned as a best management practice for removing pollutants from a discharge before it reaches surface or ground waters. As of 1988, the Region has about 59 wetlands and estuaries comprising about 8,387 acres (Basin Plan 2011). This Region does not identify beneficial uses that are specific to wetlands.

Los Angeles Regional Water Quality Control Board

The Water Quality Control Plan: Los Angeles Region Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties (1994) (Basin Plan) for this Region describes wetlands as "freshwater, estuarine, and saltwater marshes, swamps, mudflats, and riparian areas." The Regional Water Board identifies wetlands using indicators such as hydrology, presence of hydrophytic plants, and/or hydric soils (Basin Plan 1994). In 1993, the Regional Water Board contracted with Dr. Prem Saint, et al., to inventory and describe major regional wetlands.

In terms of regulating wetlands, the Regional Water Board recognizes its right to regulate natural wetlands under the Water Code. The Basin Plan also acknowledges Executive Order W-59-03, or the "No Net Loss" Policy approved in 1993. The Regional Water Board identifies three regulatory tools for wetland protection:

1. Wetland beneficial use designation: The Basin Plan defines wetland beneficial use designations as "uses of water that support wetland ecosystems, including, but not limited to, preservation or enhancement of wetland habitats, vegetation, fish, shellfish, or wildlife, and other unique wetland functions which enhance water quality, such as providing flood and erosion control, stream bank stabilization, and filtration and purification of naturally occurring contaminants." However, the Basin Plan also lists other beneficial uses relevant to wetlands, including Wildlife Habitat; Preservation of Rare and Endangered Species; Shellfish Harvesting; Water Contact Recreation; Noncontact Water Recreation; Ocean, Commercial, and Sport Fishing; Marine Habitat; Fish Migration; Fish Spawning; Estuarine Habitat; Groundwater Recharge; Preservation of Biological Habitats; Warm Freshwater Habitat; and Cold Freshwater Habitat.

2. Water Quality Objective: The Basin Plan has a narrative objective which addresses the protection of hydrologic conditions and physical habitats to sustain the functional values of wetlands.
3. Water Quality Certification (section 401) Program: According to the Watershed Management Initiative Chapter, the Water Quality Certification (section 401) Program is one of the most effective tools available for regulating hydrologic modification projects, especially those which directly impact the region's diminishing acres of wetlands and riparian areas.

Central Valley Regional Water Quality Control Board

The Central Valley Region has two Basin Plans, the Water Quality Control Plan for Tulare Lake Basin and the Water Quality Control Plan for the Sacramento and San Joaquin River Basins. The Basin Plans do not describe any specific wetland beneficial uses, but they do ascribe the beneficial use of Wildlife Habitat to wetlands, including uses of water that support terrestrial or wetland ecosystems including, but not limited to, preservation and enhancement of terrestrial habitats or wetlands, vegetation, wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), or wildlife water and food sources. Both Basin Plans also state that the region provide critically important wetland habitat for wintering waterfowl of the Pacific Flyway.

The Basin Plans generally require that wetlands meet water quality objectives and also specifically require that activities related to wetland restoration or establishment not contribute additional levels of methylmercury and other pollutants to certain mercury impaired watersheds.

Lahontan Regional Water Quality Control Board

The Water Quality Control Plan for the Lahontan Region (Basin Plan) identifies two wetland beneficial uses – Water Quality Enhancing and Flood Attenuation. The Basin Plan states that "All wetlands shall be free from substances attributable to wastewater or other discharges that produce adverse physiological responses in humans, animals, or plants; or which lead to the presence of undesirable or nuisance aquatic life" and that "All wetlands shall be free from activities that would substantially impair the biological community as it naturally occurs due to physical, chemical and hydrologic processes."

The Basin Plan uses some of the narrative objectives and numerical criteria developed for surface waters to measure water quality objectives for wetlands, but acknowledge that natural water quality characteristics of some wetlands may not be within the range for which the objectives and criteria were developed. The Regional Water Board notes that it will consider developing site-specific objectives for wetlands on a case-by-case basis.

The Basin Plan also includes considerations for protecting wetlands that are used to slow stormwater runoff into surface waters and act as a final treatment of pre-treated discharges are discussed. Additionally, the Plan has a section titled "Constructed Wetlands" that discusses the Regional Water Board's approach to constructed wetlands. Finally, the Plan includes a section titled "Wetland Protection and Management" which includes many specific measures for wetland protection.

Except for the Lake Tahoe Basin where broader wetland identification procedures apply (see discussion below), the Lahontan Regional Water Board relies on the USEPA and Corps wetland definition and the 1987 Manual for wetland delineations. Delineations must be performed by certified wetland delineators (certification

program established in accordance with section 307[e] of the Water Resources Development Act of 1990) or by other qualified professionals.

For the Lake Tahoe Basin only, the Lahontan Regional Water Board has adopted a specific wetland and riparian identification standard. For this designated area, wetland and riparian area identification is essentially a one-of-three parameter test, similar to the USFWS and CCC standards. The Lahontan Regional Water Board's standard here is used to identify "stream environment zones" (SEZs), which "are generally synonymous with 'wetlands' and 'riparian areas'" (Basin Plan for the Lake Tahoe Region section 5.7). These areas may be identified using either "key indicators" or "secondary indicators." Key indicators of SEZs include indicators of hydrology, soils, and vegetation and are:

- Evidence of surface water flow, including perennial, ephemeral, and intermittent streams, but not including rills or man-made channels; or
- Primary riparian vegetation; or
- Near surface groundwater; or
- Lakes or ponds; or
- Beach soils; or
- One of the following alluvial soils: (i) Elmira loamy coarse sand, wet variant; (ii) Marsh (Basin Plan for the Lake Tahoe Region, Section 5.7).

In the Lake Tahoe Basin, the presence of any one key indicator in an area is sufficient to classify the area as an SEZ. Where key indicators of SEZs are absent, the Lahontan Regional Water Board also considers a number of secondary indicators, including:

- Designated floodplain;
- Groundwater between 20-40 inches;
- Secondary riparian vegetation; and
- One of the following alluvial soils: (i) Loamy alluvial land; or (ii) Celio gravelly loamy coarse sand; or (iii) Gravelly alluvial land (Basin Plan for the Lake Tahoe Region, Section 5.7).

The presence of any three of these secondary indicators are sufficient to identify an area as a wetland or riparian area. While this standard sounds similar to the more restrictive three-of-three approach used by federal regulatory standards, it is important to note that the secondary indicators of hydrology, soils, and vegetation are substantially broader than those provided in the Corps' manual. Also of note is the secondary indicator of "designated floodplain." As noted above, many floodplains and other riparian areas do not satisfy the three-of-three indicator tests used by USEPA and the Corps.

Colorado River Regional Water Board

The Water Quality Control Plan, Colorado River Basin Plan for this Region does not describe any specific wetland protection measures.

Santa Ana Regional Water Board

In the 1995 Water Quality Control Plan for the Santa Ana River Basin (Basin Plan), the Regional Water Board recognizes wetlands as serving a number of important functions, such as absorption of floodwaters, shoreline erosion control, water quality improvement by the removal of pollutants, habitat for wetland species, aesthetics, recreation, research, and educational values. The Basin Plan also recognizes that the definitions of wetlands vary widely among federal agencies, but states that "wetlands are general agreed to have three characteristics: hydrophytic vegetation, hydric soils; and wetland hydrology."

The Basin Plan lists certain waters known to be wetlands and designates their beneficial uses. Although these specific wetlands are identified in the Region's Basin Plan, all wetlands in the Region are protected. It is noted that additional narrative objectives for wetlands will be developed in the future. The Basin Plan cites the USEPA and Corps wetland definition "as general reference and not as guidance." The Basin Plan provides for constructed wetlands for wastewater treatment purposes. Finally, the Basin Plan cites the objectives of the 1993 California Wetlands Conservation Policy.

San Diego Regional Water Board

The Water Quality Control Plan for the San Diego Basin (Basin Plan) (1994) contains a section describing how the Regional Water Board meets the objectives of the No Net Loss Policy. The section describes statewide policy initiatives and regional strategies. Statewide policy initiatives include inventorying wetlands, supporting wetland planning and protection, improving and enhancing wetland regulatory programs, integrating wetland regulations with other programs. Regional Water Board strategies include the participation in a "Southern California Joint Venture" that would set goals and priorities for protecting wetlands. Also noted in the Basin Plan is the detrimental effect of marinas on wetlands, and how the restoration and enhancement of wetlands is likely to be more successful than creation of new wetland where none had existed previously. The Basin Plan does not list any beneficial uses that are specific to wetlands.

5.4 Statewide Initiatives For Wetland Protection

This section provides an overview of recent wetland initiatives and events, as summarized in Table .

Table 5-6: Timeline of Recent California Wetland Initiatives

Date	Initiative
1993	**Executive Order W-59-93, commonly referred to as the State "No Net Loss Policy" for wetlands**
1994	**Recommendations from Hydromod TAC**
2001	**First US Supreme Court case to limit scope of federal jurisdiction of waters under the Clean Water Act (CWA; *SWANCC*)**
2003	**State Water Board report to California Legislature detailing steps needed to protect and conserve wetlands not subject to the CWA**

2004	**State Water Board workplan for addressing limited scope of federal jurisdiction over waters of the state** **General Order 2004-0004-DWQ adopted to cover dredged or fill discharges to waters deemed outside of federal jurisdiction by the Corps**
2006	**Second Supreme Court case to limit scope of federal jurisdiction of waters under the CWA (*Rapanos*)**
2007	**MOU between Secretaries of California EPA and California Natural Resources Agency to form California Water Quality Monitoring Council** **Scoping meetings for State Water Board Policy**
2008	**California Water Quality Monitoring Council's initial recommendations for water quality and ecosystem monitoring and assessment** **Resolution 2008-0026 by State Water Resources Control Board to direct the development of the Policy** **Public workshops held for phase 1 of Policy**
2009	**TAT Memoranda 1, 2, and 3 released**
2010	**California Water Quality Monitoring Council's recommendations for comprehensive monitoring in California** **California Water Quality Monitoring Council approval of CWMW WRAMP framework**
2011	**TAT Memorandum 4**

1993: Executive Order W-59-93

California Governor Pete Wilson adopted the California Wetlands Conservation Policy in 1993 as Executive Order W-59-93.[47] Commonly referred to as the "No Net Loss Policy" for wetlands, Executive Order W-59-93 establishes the intent of the state to develop and adopt a policy framework and strategy to protect the state's wetland ecosystems. The goals of this policy are to:

- Ensure no overall net loss and achieve a long-term net gain in the quantity, quality, and permanence of wetlands acreage and values in California in a manner that fosters creativity, stewardship and respect for private property;
- Reduce procedural complexity in the administration of state and federal wetlands conservation programs; and

[47] The executive order can be accessed at http://www.waterboards.ca.gov/water_issues/programs/cwa401/docs/wrapp2008/executive_order_w59_93.pdf

- Encourage partnerships to make landowner incentive programs and cooperative planning efforts the primary focus of wetlands conservation and restoration.

In order to achieve these goals, the No Net Loss Policy establishes a number of tasks and criteria for state agencies in developing a state wetland program, including recognizing diverse wetlands, developing and adopting a consistent wetland definition for state regulatory purposes, improving permitting efficiency, and coordinating federal, state, and local wetland protection efforts. In its task to develop and adopt a consistent wetlands definition for state regulatory purposes, the No Net Loss Policy specifically establishes that:

> "Because of the lack of consistency in the existing definitions of wetlands definitions used by State agencies, the State will work toward the adoption of a single definition for regulatory purposes. The definition will, to the greatest extent possible, be consistent with the definition and wetlands delineation manual used by the Federal government."

1994: Hydromodification, Wetlands and Riparian Technical Advisory Committee

In 1994, the Hydromodification Technical Advisory Committee (Hydromod TAC, 1994) presented a report with recommendations for "identifying program changes to decrease the impacts of hydromodification and wetlands and riparian destruction on the beneficial uses of water." The Hydromod TAC was a multi-agency panel convened by the State Water Board and consisted of representatives from a variety of different agencies and organizations, including the USEPA; US Department of Agriculture Soil Conservation Service; CDFW; and the Los Angeles, San Francisco, and Lahontan Regional Water Boards. In its 1994 recommendations, the Hydromod TAC noted the need for a state wetland definition and coordination with state and federal agencies to improve project planning and permitting. It also recommended that the State Water Board:

> "Focus its mitigation strategy to protect areas that are not addressed by other agencies, integrate mitigation with watershed planning, adhere to the federal Guidelines, work towards functional assessment for determining mitigation obligation, encourage mitigation banking with adequate environmental safeguards, and improve monitoring."

2003: State Water Board Report to Legislature

In 2003, in response to *Solid Waste Agency of Northern Cook County v. U.S. Army Corps of Engineers, 2011* (*SWANCC),*[48] the State Water Board submitted a report to the California Legislature titled "Regulatory Steps Needed to Protect and Conserve Wetlands Not Subject to the Clean Water Act (State Water Board 2003)." This report reviews the critical role that wetlands and riparian areas have in protecting the beneficial uses of waters of the state. It further recognizes that a watershed-level approach is most effective in protecting wetlands and riparian areas and their associated water quality functions. The regulatory steps identified in the report include:

<u>Steps Needed to Protect Waters Not Subject to the CWA:</u>

- Explicitly mandate wetland protection;

[48] See Section 6.2 for further discussion of the case and its implications for wetland protections.

- Focus on protecting wetland function rather than on discharges of pollutants;
- Recognize and protect landscape-level wetland functions; and
- Protect wetland functions from all types of activities.

Steps Needed to Establish a State Water Board Wetland Permitting Program:

- Adopt a State Water Board wetlands policy;
- Enhance interagency communication and coordination;
- Adopt beneficial use designations for wetland functions;
- Advise project proponents of their state responsibilities;
- Encourage local land use/water quality linkage;
- Mandate protection of wetland functions; and
- Use best available science.

Steps Needed to Protect "Isolated" Wetlands:

- Advise dischargers of need to report discharges;
- Develop and implement endangered species coordination;
- Adopt a state wetland definition;
- Adopt a state analog of the federal Guidelines; and
- Implement permitting for "isolated" waters.

2004: Workplan for Wetland Protection

In 2004, the State Water Board developed a document titled "Workplan: Filling the Gaps in Wetland Protection" (State Water Board, 2004a), in response to a California Environmental Protection Agency request that the State Water Board address waters of the state no longer protected under the CWA, as well as some of the policy needs outlined in the 2003 Report to the Legislature. Tasks 3 and 4 of the 2004 Workplan are "Develop Beneficial Use Definitions for Wetland-Related Functions" and "Adopt State Wetland Definition… [to] provide a standard metric to help determine compensatory mitigation requirements and compliance with [the] 'no net loss' policy" (State Water Board, 2004a). In addition, the 2004 Workplan included a task to develop a statewide policy/plan for wetland protection "at least as protective as the federal requirements."

2004: General Order for Discharge of Dredged or Fill Materials to Waters Outside of Federal Jurisdiction

In response to reduced federal authorities, the State Water Board adopted Water Quality Order 2004-0004-DWQ, "Statewide General Waste Discharge Requirements (WDRs) for Dredged or Fill Discharges to Waters Deemed by the Corps to Be Outside of Federal Jurisdiction."[49] These general WDRs reflect that streams and wetlands are waters of the state under the Porter-Cologne Act regardless of whether or not they

[49] http://www.waterboards.ca.gov/board_decisions/adopted_orders/water_quality/2004/wqo/wqo2004-0004.pdf

are also waters of the United States under the CWA. The general WDRs provide a tool to regulate some impacts to non-federal state waters; however, the general WDRs applies only to minor discharges of dredged or fill material to these waters. Stream and wetland impacts larger than two-tenths (0.2) of an acre or 400 linear feet for fill and excavation discharges, or of more than 50 cubic yards for dredging discharges are not covered by the general WDR, nor are any impacts that do not involve discharges of dredged or fill material (e.g., discharge of stormwater or wastewater; State Water Board, 2004b).

2007: Memorandum of Understanding for Water Quality Monitoring

In November 2007, the Secretaries of the California EPA and the California Natural Resources Agency signed a Memorandum of Understanding (MOU), mandated by California Senate Bill 1070 (Wat. Code section 13167 and section 13181), to establish the California Water Quality Monitoring Council (Monitoring Council).[50] The MOU requires the boards, departments, and offices within the California EPA and the California Natural Resources Agency to integrate and coordinate their water quality and related ecosystem monitoring, assessment, and reporting.

California Senate Bill 1070 and the MOU require that the Monitoring Council develop specific recommendations to improve the coordination and cost-effectiveness of water quality and ecosystem monitoring and assessment, enhance the integration of monitoring data across departments and agencies, and increase public accessibility to monitoring data and assessment information. While the Monitoring Council may recommend new monitoring or management initiatives, it builds on existing effort to the greatest extent possible. The Monitoring Council published its initial recommendations in December 2008, and its recommendations for a comprehensive monitoring in California in December 2010. The main products of the Monitoring Council are the "My Water Quality" internet portals, which are sources of information about various aspects of water quality, such as wetland health, safety of water for swimming, and bioaccumulation of contaminants in fish and shellfish. To date, the Monitoring Council has produced three internet portals.

The Monitoring Council has several workgroups, including the California Wetland Monitoring Workgroup (CWMW). The CWMW evolved from a statewide steering committee formed to coordinate agencies' wetland regulatory activities and to advise on development, implementation, and routine use of standardized wetland and riparian monitoring tools. The objectives of the CWMW include developing and guiding a comprehensive wetland monitoring program for the state of California, enhancing the California Wetlands Portal, compiling information on existing wetland monitoring programs and activities, and developing agreements among partner agencies on data sharing.[51]

2008: State Water Board's Wetlands Resolution

In 2008, the State Water Board adopted Resolution 2008-0026, which provides the course of development for the proposed Procedures. The 2008 resolution directs State Water Board staff to address policy directives and

[50] http://www.mywaterquality.ca.gov/monitoring_council/index.shtml
[51] For more information, see the website: http://www.waterboards.ca.gov/mywaterquality/monitoring_council/wetland_workgroup/http://www.waterboards.ca.gov/mywaterquality/monitoring_council/wetland_workgroup/

recommendations of the State's No Net Loss Policy, Hydromod TAC, the State Water Board 2003 Report to the Legislature, and 2004 Workplan.

Resolution 2008-0026 directs work to be performed in three phases. The objectives of Phase 1 constitute the proposed Procedures. Phase 2 requirements are to expand the scope of the proposed Procedures to protect wetlands from all other activities impacting water quality (e.g. other than dredged or fill activities) by defining wetland beneficial uses and water quality objectives, along with a program of implementation to achieve the water quality objectives. Phase 3 requirements are to extend the proposed Procedures to identifying and protecting water quality benefits provided by riparian areas. The State Water Board considers Phases 2 and 3 to be separate projects, and will address the environmental impacts of them in future environmental documents.

2008: Development of Technical Advisory Team

Also in 2008, through USEPA grant funding, the State Water Board worked with the SFEI to form a TAT to "provide the breadth and depth of scientific understanding about wetlands and riparian areas needed to assure the scientific credibility of the policy [Wetland and Riparian Area Protection Policy]" (TAT Memo 1). In 2009, TAT released its second memo, *Wetland Definition*, and its third memo, *Landscape Framework for Wetlands and Other Aquatic Areas.* In 2011, TAT released its fourth memo, *Wetland Identification and Delineation.*

The TAT studied existing wetland definitions and found that existing definitions do not fully reflect the variety of wetlands found in California (TAT, 2009). Some definitions are either too general to cover California wetlands without ambiguity, while others are too narrow and exclude some California wetlands. The State Water Board used existing definitions to develop the wetland definition in the proposed Procedures, which is:

> An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area either lacks vegetation or the vegetation is dominated by hydrophytes.

2010: Agency Endorsement of Statewide Wetland and Riparian Area Monitoring Program

In 2010, the Monitoring Council formally endorsed the *Tenets of a State Wetland and Riparian Area Monitoring Plan,* developed by the CWMW (Monitoring Council, 2010). The Monitoring Council has recommended that state agencies incorporate these goals into their activities related to wetlands.

6. PROJECT DESCRIPTION

This section provides a discussion of the project objectives, need and a brief description of the proposed Procedures. For a complete description of the proposed Procedures, please refer directly to the proposed Procedures.

6.1 Project Objectives

The objectives of the proposed Procedures are to:

1. Advance statewide efforts to ensure no overall net loss and a long-term net gain in the quantity, quality and sustainability of wetlands in California in a manner that fosters creativity, stewardship, and respect for private property (Executive Order W-59-93-Calfiornia's "No Net Loss" Policy).
2. Support the Water Boards' environmental priorities for protecting and enhancing California's vital wetland areas through watershed-based regulatory and monitoring strategies.
3. Establish a uniform regulatory approach consistent with the federal CWA section 404 program for the discharge of dredged or fill material into all waters of the state, including wetland areas that qualify as waters of the state.
4. Enhance the Water Boards' capabilities to support efforts of other agencies and groups in the conservation planning of watersheds, wetlands, and other aquatic resources (e.g., watershed plans such as habitat conservation plans and national community conservation plans).
5. Strengthen regulatory effectiveness and improve consistency across all Water Boards.
6. Streamline the 401 certification process.
7. Establish procedures for regulation of dredged or fill discharges to all waters of the state, including those outside of federal jurisdiction.

6.2 Project Need

Resolution No. 2008-0026, adopted by the State Water Board on April 15, 2008, directed staff to develop the proposed Procedures. The Resolution identifies the following elements to be included in the proposed Procedures: "(a) a wetland definition that would reliably define the diverse array of California wetlands based on the United States Army Corps of Engineers' wetland delineation methods to the extent feasible, (b) a wetland regulatory mechanism based on the federal Guidelines (40 C.F.R. parts 230-233) that includes a watershed focus, and (c) an assessment method for collecting wetland data to monitor progress toward wetland protection and to evaluate program development." The proposed Procedures establish a wetland definition and a state version of the federal Guidelines to protect all waters of the state, including wetlands, which are subject to potential dredged or fill impacts. Development of an assessment method will be addressed separately from the proposed Procedures. The proposed Procedures, as discussed in more detail below, will ensure the protection of wetlands that

qualify as waters of the state but are not under federal jurisdiction. The proposed Procedures also provide consistency for the Water Boards regulation of discharges of dredged or filled materials to all waters of the state. Finally, the proposed Procedures will ensure that compensatory mitigation is sufficient to offset impacts to the quantity and quality of wetlands that qualify as waters of the state.

Lack of Federal Protection for Some Waters

Certain waters of the state have lost protection under the CWA due to U.S. Supreme Court decisions regarding the definition of waters of the United States. In 2001 and 2006, two U.S. Supreme Court decisions, SWANCC and Rapanos, had important implications for the definition of "waters of the United States." The Supreme Court cases clarified this definition to include the following types of waters (USEPA and Corps, 2007):

- Traditional navigable waters;
- Wetlands adjacent to traditional navigable waters (including wetlands without a continuous surface connection to traditional navigable waters);
- Relatively permanent non-navigable tributaries to traditional navigable waters;
- Wetlands with a continuous surface connection to relatively permanent non-navigable tributaries of traditional navigable waters; and
- Non-navigable, not relatively permanent tributaries and their adjacent wetlands where such tributaries and wetlands have a significant nexus to traditional navigable water.

Some waterbodies in California do not conform to the types of waters listed above, such as waters that are non- navigable, are not "relatively permanent," and do not have a significant nexus to traditional navigable waters. Consequently, federal jurisdiction and CWA protection does not apply to these waters. In California, such waterbodies typically include ephemeral streams, headwaters, and wetlands such as vernal pools, playas, prairie potholes, and alpine wet meadows (National Research Council, 1995). A study by Comer et al. (2005) names more than 13 wetland ecological systems within California that occur in partial or total isolation from other waterbodies, including Northern California Claypan and Volcanic Vernal Pools, South Coastal California Vernal Pools, Central Valley Alkali Sinks, and the California Mediterranean Alkali Marshes.

Prior to the U.S. Supreme Court decisions in 2001 and 2006, the permits issued by the federal government under CWA section 404 had a wider jurisdictional reach over waters of the state. Following the decisions, the applicability of federal law to state waters has been reduced, and is now insufficient to protect the full extent of waters in the state. The Water Boards protect waters of the state that are not waters of the United States under the authority of the Porter-Cologne Act alone.

Inconsistent Wetland Definition and Dredged or Fill Regulation

There is no single accepted definition of wetlands at the state level. In other words, the determination of whether a water is a wetland is based on different standards by different agencies in California. The

definition of wetlands even differs amongst the Water Boards (as shown in section 5.3). Some Water Boards have adopted the federal wetland definition and delineation methods, but others have not. The proposed Procedures establish a wetland definition for the Water Boards. As noted elsewhere, the determination of whether a wetland is also a water of the state will continue to be made on a case-by-case basis by the Water Boards.

In addition, the Water Boards do not have consistent dredged or fill application submittal and approval procedures. For example, based on the review of current practices, some Water Boards may require an applicant to conduct an alternatives analysis that would not be required under the proposed Procedures and others may not require an alternatives analysis where one would be required under the proposed Procedures. The proposed Procedures establish consistency in regulating discharges of dredged or fill material to waters of the state, including wetlands that qualify as waters of the state, by adopting wetland delineation methods and uniform dredged or fill application submittal and approval procedures for use by the Water Boards.

Performance of Compensatory Mitigation

Finally, as discussed in section 5.2, *Impacts of Compensatory Mitigation*, compensatory mitigation throughout the state has not been adequate to prevent loss in the quantity and quality of wetlands that qualify as waters of the state, and other waters of the state, in California. The second component of the proposed Procedures, the requirements applicable to discharges of dredged or fill material based on the federal Guidelines, includes clarification of compensatory mitigation requirements with the intent of making compensatory mitigation more robust and successful in California.

6.3 Wetland Definition

The first element of the proposed Procedures is a wetland area definition. As discussed in section 5.3, many Regional Water Boards recognize a variety of wetland types, including some non-vegetated areas such as mudflats. However, not all Water Boards have definitions that clearly encompass all areas that would be identified as wetlands under the proposed Procedures. The proposed Procedures establish a standard wetland definition for use by the Water Boards. The definition recognizes the diversity of wetlands in this state created by the varied climate, geologic, and cultural influences. It can also be translated into a standard field-based set of delineation procedures to identify the extent of the wetland area.

The statewide wetland definition is intended to provide clear and consistent direction for determining whether an aquatic feature is a wetland. This definition does not affect the meaning of “waters of the state” as it pertains to the Water Boards’ jurisdiction pursuant to the Porter-Cologne Act, nor does it modify the current authorities of the Water Boards to protect water quality. Rather, a statewide wetland definition would provide consistent identification standards for certain types of aquatic features that are sometimes difficult to identify in the field, and for which current policy does not

provide adequate guidance. It is important to note, however, that regardless of whether an aquatic feature meets the wetland definition, it may not qualify as a water of the state under the jurisdiction of the Water Boards. Whether a wetland feature is also a water of the state under the jurisdiction of the Water Boards must be decided on a case-by-case basis by Water Board staff, as is presently the situation. In other words, the adoption of the wetland definition under this proposed Procedures do not automatically extend the Water Board's jurisdiction to every aquatic feature meeting the definition. Although the definition does not extend the Water Board's jurisdiction to all of these features, it will help an applicant understand which types of features might warrant consultation with the Water Boards to determine whether they are waters of the state before conducting fill activities.

The proposed Procedures define a wetland area as follows:

> An area is a wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water or both; (2) the duration of such saturation is sufficient to cause a anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

This definition reflects current scientific understanding[52] of the formation and functioning of wetlands. Hydrology is the dominant factor in wetland formation because it controls the development of anaerobic substrate conditions that create wetland soils. Wetland soils, in turn, influence the occurrence of wetland plants that tolerate anaerobic conditions. The proposed Procedures wetland definition incorporates these three characteristics of hydrology, wetland soils, and wetland vegetation.

The Corps also defines wetlands using a "three parameter" definition.[53] The statewide definition in the Proposed Procedures differs slightly from the Clean Water Act definition in that, under the state definition, an area can also be classified as a wetland if it is devoid of any vegetation, but wetland hydrology and soils are present. Such areas provide the hydrological and ecological functions and beneficial uses that distinguish wetlands from other places. Wetlands can naturally lack vegetation for many reasons such as aridity and intolerable physiochemical or biotic conditions. Tidal flats, playas, some river bars, and shallow non-vegetated ponds are common kinds of non-vegetated wetlands that could meet the proposed Procedure's definition of wetlands, but not the federal definition of wetlands.

However, in practice, delineations conducted in California are subject to the Corps' Arid West Supplements (Corps 2008), which categorizes areas devoid of vegetation but with wetland hydrology and soils, as federal jurisdictional waters. Under Corps procedures, Federal jurisdictional waters are

[52] See Water Board response to peer review of wetland definition and delineation procedure.

[53] Corps defines wetlands as "Those areas that are inundated or saturated by surface water or ground water at a frequency and duration sufficient to support, and under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas." (33 CFR 328.3(b); 40 CFR 230.3(t)).

permitted equivalently to wetland areas. Thus, the state's definition is effectively equivalent to the Corps definition as implemented through the Arid West Manual.

The proposed wetland definition, like the federal definition, also incorporates the concept of "normal circumstances." This provides that if the wetland hydrology or hydrophytic vegetation normally present is physically altered by a natural, inadvertent or purposeful event, the area should be evaluated as it existed before the event. This is important because determining whether normal circumstances are present is one of the first steps in and is essential for wetland identification and delineation for disturbed sites.[54] In these cases, an evaluation of normal circumstances is necessary to determine or reasonably infer whether the purpose of the physical alteration of hydrology or hydrophytic vegetation was to avoid regulation. If this is the case, the Water Boards may assert regulatory jurisdiction over the site, if the wetland would also qualify as a water of the state. The Corps' 1987 wetland delineation manual provides specific procedures to be followed in delineating wetlands when disturbed conditions exist.

6.4 Wetland Delineation Procedures

The second element of the proposed Procedures is the wetland delineation procedures. The proposed Procedures adopt the Corps wetland delineation manual and regional supplements listed below (collectively referred to as "1987 Manual and Supplements") for use in determining the extent of a wetland area that meets the criteria of the wetland definition.

- Environmental Laboratory. 1987. U.S. Army Corps of Engineers Wetlands Delineation Manual. Technical Report Y-87-1. U.S. Army Engineer Waterways Experiment Station, Vicksburg, MS.
- U.S. Army Corps of Engineers. 2008. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Arid West Region (Version 2.0). ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-08-28. Vicksburg, MS: U.S. Army Engineer Research and Development Center
- U.S. Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual Western Mountains, Valleys, and Coast Region (Version 2.0). ed. J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-3. Vicksburg, MS: U.S. Army Engineer Research and Development Center)

Under the proposed Procedures, the Water Boards would rely on delineations approved by the Corps within the boundaries of waters of the United States. Where federal jurisdiction does not extend to state waters (e.g., isolated waters and some non-vegetated wetlands) the proposed Procedures direct applicants to use the methods described in the 1987 Manual and Supplements. In some cases, the Water Boards may require supplemental field data from the wet season to substantiate wetland

[54] TAT Memorandum No. 4: Wetland identification and Delineation Version 14, Revised September 1, 2012.

delineations conducted in the dry season, equivalent to the requirements of the Arid West Supplements (Corps 2008), for areas where wetland indicators are especially difficult to resolve, or where the delineations are potentially contentious.

6.5 Procedures for Regulation of Dredged or Fill Material to Waters of the State

The final element of the proposed Procedures include regulatory procedures for the discharge of dredged or fill material into waters of the state. These procedures apply to all waters of the state, regardless of whether they also meet the definition of wetland. As such, the procedures extend to applications for discharges of dredged or fill material into waters outside of federal jurisdiction, which would be regulated with the adoption of WDRs through the Water Boards.

Adoption of these procedures will help achieve several important goals. A single set of procedures applied by all Water Boards will improve regulatory effectiveness over discharges of dredged or fill material statewide. Likewise, as these procedures are also aligned with the Corps' regulations, the permitting process will be streamlined and regulatory certainty for the applicant will be increased. In addition, clear and consistently applied requirements for avoidance, minimization and mitigation will increase the protection of waters of the state, including wetlands, from dredged or fill discharge impacts.

The following sections describe the regulatory procedures in more detail. More information on how the Water Boards' will use this information to review applications will be discussed in section 6.6. For a complete description of the proposed Procedures, please refer to the proposed Procedures.

Project Application Submittal for Individual Orders

Current application requirements for water quality certifications are outlined in the California Code of Regulations, title 23, section 3856. Generally, however, the information required by section 3856 does not include all necessary information to make a regulatory decision, leading to delays in processing applications. To address this, the proposed Procedures include additional information requirements for a water quality certification application. Some items would be required for all applications; while additional items would be required on a case-by-case basis. These additional items are routinely requested by the Water Boards to fully analyze project impacts on water quality. By including these items in the application requirements, the amount of time to determine that an application is complete by the Water Boards should be reduced.

Items required for a complete application, in all cases

All items required in California Code of Regulations, title 23, section 3856:

- Name, address, and telephone number of applicant and applicant's agent (if applicable)

- A full, technically accurate description, including the purpose and final goal, of the entire activity
- Identification and copies of federal licenses/permits
- Copy of draft or final CEQA documents
- Fee deposit
- Location of activity are in latitude and longitude
- Name of receiving water bodies
- Types of receiving water bodies, and total estimated quantity of waters of the U.S., by type, that may be adversely impacted temporarily or permanently by a discharge or by dredging
- Total estimated quantity (in acres and, where appropriate, linear feet) of waters of the United States, by type, proposed to be created, restored, enhanced, purchased from a mitigation or conservation bank, set aside for protection, or otherwise identified as compensatory mitigation for any anticipated adverse impacts.
- Description of steps taken to avoid, minimize, and compensate for a loss of significant impacts to beneficial uses of waters of the state
- Cumulative impacts from projects within the last five years, or planned within the next five years, that are related to the proposed project.

The proposed Procedures add additional items to what is currently required for a complete application as listed above. These items have been added because, based on current practice, the items are routinely requested by the Water Boards after an application has been submitted as necessary for a complete application. As this information is not currently identified for applicants prior to applying, a significant delay in the application process results from collecting the information after the initial application has been submitted. This additional information is as follows:

- If wetlands are present, a delineation of potentially impacted wetland areas using the U.S. Army Corps of Engineers Wetland Delineation Manual and Supplements (1987, 2008, 2010). Any wetland delineation report submitted by the applicant to the Corps for the project site will suffice for the state application. However, if there is wetland areas outside of federal jurisdiction on the project site, delineation for those waters will also be required. If applicants are unsure if wetlands are jurisdictional (that is, whether they also qualify as waters of the state), they should contact the Water Boards for a pre-application consultation.
- A timeline of the proposed project, including the start and end dates, and dates of the proposed dredged or fill discharge activities
- Map(s) of the project area that show: 1) property boundaries (or lands to be utilized by the applicant) 2) the extent of aquatic resources within the boundaries of the project, and 3) all aquatic resources outside of the boundary of the project area.
- A description of the waters that are proposed to receive impact, including: 1) the beneficial uses as listed in the applicable water quality control plan, 2) description of discharge at each individual impact location, 3) quantity of impact at each location, 4) assessment of potential direct and indirect impacts to listed beneficial uses (and potential mitigation measures for those

potential impacts), 5) any existing water quality impairments, 6) the source of the impairment (if known), and 7) a description of any threatened or endangered aquatic species or their habitat.

Additional Information Required for a Complete Application

The proposed Procedures identify additional information that may also be required by the Water Boards on a case-by-case basis for a complete application. These items are outlined and explained in more detail below. For the purposes of the description provided below, the proposed Procedures define the permitting authority as the entity or person issuing the Order (i.e., the applicable Water Board, Executive Director or Executive Officer, or his or her designee).

a. *"If required by the permitting authority on a case-by-case basis, if the wetland area delineations were conducted in the dry season, supplemental field data from the wet season to substantiate dry season delineations."*

   For areas where wetland indicators are especially difficult to resolve, or where the delineations are potentially contentious supplemental field data may be needed to confirm, or deny, dry season delineations. This is a recommended procedure for "difficult situations" as described in the Corps' delineation supplements for California (Corps 2008).

b. *"If required by the permitting authority on a case-by-case basis, an assessment of the potential impacts associated with climate change related to the proposed project and any proposed compensation, and any measures to avoid or minimize those potential impacts."*

   Climate change should be taken into consideration during the project evaluation stage, in accordance with State Board Resolution No. 2008-0030, "Requiring Sustainable Water Resources Management." Consideration should be given to the potential impacts on project viability and mitigation success. Projects subject to sea level rise should consider the need for project design to accommodate for the long term viability of the project and compensation area. Projects involving channelization should show that anticipated changes in flows due to increased precipitation patterns, and potential flooding, due to climate change are analyzed.

c. *"If required by the permitting authority on a case-by-case basis, if no exemptions apply, an alternatives analysis In accordance with section IV.B.5 and any supporting documentation."*

   In some cases, the Water Boards may require an applicant to submit an alternatives analysis to establish that the proposed project is the least environmentally damaging practicable alternative (LEDPA). The scope and extent of an alternatives analysis would be determined by the Water Boards based on the scale and the severity of the project impacts to aquatic resources. For minimally impacting projects, documentation that sufficient measures are incorporated in the project to avoid and minimize impacts to aquatic resources may be sufficient to satisfy the alternatives analysis requirement. Under the proposed Procedures, an

alternatives analysis will not be required in all instances; a number of exclusions for the alternatives analysis requirement are provided. The criteria for determining the need for an alternatives analysis is reviewed in section 6.6.

d. *"If compensatory mitigation is required by the permitting authority on a case-by-case basis, an assessment of the overall condition of aquatic resources proposed to receive a discharge of dredged or fill material and their likely stressors, using an assessment method approved by the permitting authority."*

When a project includes unavoidable impacts to waters requiring mitigation, the proposed Procedures require an assessment of the overall condition of those waters using an assessment method approved by the Water Boards. The California Rapid Assessment Method (CRAM) is an example of a method that the Water Boards would approve in such situations. CRAM is a component of the Wetland and Riparian Area Monitoring Plan (WRAMP)[55] endorsed by the California Water Quality Monitoring Council. In approving assessment methods, the Water Boards will cooperate in achieving goals of the California Water Quality Monitoring Council (Monitoring Council) in the collection and reporting of water quality data and information pursuant to Water Code section 13181. This includes implementing guidance, methods, and plans endorsed or directed by the Monitoring Council for monitoring and assessment of aquatic resources.

"[In cases where compensatory mitigation is required] a draft compensatory mitigation plan developed using a watershed approach containing the items below. Compensatory mitigation plans are not required for Ecological Restoration and Enhancement Projects. Draft compensatory mitigation plans shall comport with the State Supplemental Dredged or Fill Guidelines, Subpart J, and include the elements listed below.

The requirements for the contents of a draft compensatory mitigation plan under the proposed Procedures are listed below.

i. *A watershed profile for the project evaluation area for both the proposed dredged or fill project and the proposed compensatory mitigation project. The scope and detail of the watershed profile shall be commensurate with the magnitude of impact associated with the proposed project, and shall describe the overall abundance, diversity, and condition of aquatic resources in the project evaluation area. The watershed profile shall include a map and report characterizing the location, abundance, and diversity of aquatic resources*

[55] WRAMP is a plan for comprehensive monitoring and assessment of aquatic resources using a watershed or landscape context. WRAMP, like U.S.EPA's three-tier monitoring and assessment framework, includes three levels of assessment and analysis, and provides the framework for making these three levels of assessment work together in the analysis of the overall condition and viability of aquatic resources within a watershed. See http://www.mywaterquality.ca.gov/monitoring_council/wetland_workgroup/#frame for more information

in the project evaluation area, and a report characterizing the condition of aquatic resources in the project evaluation area and the environmental stress factors affecting condition. In some cases, field data may need to be collected in the project evaluation area to confirm the reported condition. Some or all of the information may be obtained from a watershed plan.

Sources for information needed for a watershed profile could include online searches, maps, watershed plans, and field work. Much of this information could be obtained from a watershed plan, if one is available.

ii. A description of how the compensatory mitigation plan, whether located inside or outside the project watershed area, does not cause a net loss of the overall abundance, diversity, and condition of aquatic resources, based on the watershed profile. The level of detail in the plan shall be sufficient to accurately evaluate whether compensatory mitigation offsets the adverse impacts attributed to a project.

The purpose of this information is to provide sufficient information to evaluate direct, secondary, and cumulative impacts of a proposed project on aquatic resources in the project evaluation area and to determine if the compensatory mitigation alternatives adequately compensate for these impacts within the evaluation area. This analysis ensures that a watershed approach is being taken in developing a compensatory mitigation plan. A watershed approach is an analytical process for evaluating the environmental effects of a proposed project and promotes decisions that support the sustainability or improvement of aquatic resources in the watershed.

iii. Preliminary information about ecological performance standards, monitoring, and long-term protection and management, as described in State Supplemental Dredged or Fill Guidelines.

If proposed compensatory mitigation is permittee responsible, the draft compensatory mitigation plan should include information about how ecological-based performance standards will be used to determine when and how the proposed compensatory mitigation project will achieve its objectives. The plan should include parameters to be monitored throughout the monitoring period, in order to determine if the compensatory mitigation project is on track to meet performance standards. Long-term protection and management strategies are needed to determine how the compensatory mitigation project will be managed after performance standards have been achieved and to ensure the long-term sustainability of the resource. More information on this item can be found in Appendix A: State Supplemental Dredged or Fill Guidelines, Subpart J-Compensatory Mitigation for Losses of Aquatic Resources, section 230.94: Planning and Documentation.

iv. *A timetable for implementing the proposed mitigation plan.*

A timetable for implementation of permittee responsible mitigation would include time frames for all planned project activities, including performance monitoring. If proposed compensatory mitigation involves the purchase of credits from a mitigation bank, or an In-Lue fee program, timing for the purchase of those credits.

v. *If the permitting authority requires buffers, design criteria and monitoring requirements for the buffers.*

Buffers to an aquatic resource could be required as part of compensatory mitigation. Buffers are important to ensure the long-term viability of aquatic resources, and provide habitat corridors necessary for the full ecological services of the aquatic resources. If buffers are an element of required compensatory mitigation, design criteria information, including boundaries and other pertinent ecological information, as well as monitoring to ensure the success of buffer areas will be needed.

vi. *If the compensatory mitigation involves restoration or establishment as the form of mitigation, applicants shall consult with state and federal land management agencies, fire control districts, flood control districts, local mosquito-vector control district(s), and any other interested local entities prior to initial site selection. Appropriate mosquito and vector control measures, including maintenance specifications, shall be developed in coordination with local mosquito-vector control district(s) or other responsible public agency(ies) during the initial compensatory mitigation project design stage.*

Coordination with local mosquito-vector control districts will facilitate the protection of public health and welfare from diseases transmitted by mosquitos. Collaboration with these agencies early on in the planning process can be beneficial to both the applicant and mosquito-vector control districts by identifying potential compensatory mitigation locations early on.

vii. *If the compensatory mitigation involves restoration or establishment on a site(s) within five miles of any airport, applicants shall consult the applicable airport land use commission or other appropriate responsible public agency to determine whether the proposed compensatory mitigation project may pose a danger to air traffic safety, and submit proof of consultation. These entities should be consulted as early as possible during the initial compensatory mitigation project design stage.*

Converting land use to aquatic resources could have the potential to attract birds to airport air space which in turn could create air traffic safety concerns. The Water Boards would need documentation that an applicant has taken the necessary steps to consult

with airports that are within the vicinity of the proposed compensatory mitigation location.

e. *"If required by the permitting authority, in cases where project activities include in-water work or water diversions, a proposed water quality monitoring plan to monitor compliance with water quality objectives of the applicable water quality control plan. At a minimum, the plan should include type and frequency of sampling for each applicable parameter.*

In-water work and water diversions could result in water quality impairments. An applicant may need to demonstrate that a plan to monitor water quality to insure that objectives such as turbidity, oil and grease, pH, and dissolved oxygen are not exceeded during project activities.

f. *"In cases where temporary impacts are proposed, a draft restoration plan for restoring areas of temporary impact to pre-project conditions including, at a minimum, the following: the objectives of the restoration plan; a work schedule; plans for grading of disturbed areas to pre-project contours; a planting palette with plant species native to the area; seed collection locations; an invasive species management plan; a description of performance standards used to evaluate attainment of objectives; the timeframe for determining attainment of performance standards; and maintenance requirements (e.g. watering, weeding, and replanting). The level of detail in the restoration plan shall be sufficient to accurately evaluate whether the restoration offsets the adverse impacts attributed to a project.*

Prior to issuance of the Order, the applicant shall submit a final restoration plan that describes the restoration of all temporarily disturbed areas to pre-project conditions."

Temporary impacts are impacts that can temporarily cause a physical loss and/or degradation of an aquatic resource. In order for an impact to be considered temporary, it needs to be restored to pre-project conditions either through a natural ecological process, or through active restoration. In order to ensure that these areas are successfully restored to pre-project condition through active restoration, a restoration plan is required. A draft restoration plan is required in order to deem an application complete. Water Board staff will review the draft plan that is submitted and will require that a final plan is submitted before issuing an Order for the proposed project. The extent and level of detail in a draft restoration plan should be commensurate with the size and the scope of the proposed temporary impacts. If an applicant is unsure about the level of detail that will be sufficient for a restoration plan, they should contact the Water Boards for pre-application consultation.

viii. *"For Ecological Restoration and Enhancement Projects, a draft monitoring plan including, at a minimum, the following: project objectives; description of performance standards used to evaluate attainment of objectives; protocols for monitoring and data assessment; the timeframe and responsible party for determining attainment of performance standards; and monitoring*

schedule. For Ecological Restoration and Enhancement projects, monitoring shall consist of at least one assessment of the overall condition of aquatic resources and their likely stressors, using an appropriate assessment method subject to the approval of the permitting authority, prior to restoration and/or enhancement and two years following restoration and/or enhancement to determine success of the restoration and/or enhancement."

An ecological restoration and enhancement plan is required for Ecological Restoration and Enhancement Projects. Generally, ecological restoration and enhancement plans are prepared when project proponents are applying for grant funding for the project. Information needed for this application requirement need not be duplicative information submitted for grant funding, or for other federal application requirements, but the plan may need to be supplemented to ensure that the project would comply with state water quality standards. The extent and level of detail in the plan should be commensurate with the size and the scope of the proposed temporary impacts. If an applicant is unsure about the level of detail that will be sufficient for a restoration plan, they should contact the Water Boards for pre-application consultation.

In addition, a minimum of one condition assessment (using a condition assessment method subject to the approval of the Water Boards) before and one after restoration activities take place is needed to measure and document the success of the project. The California Rapid Assessment Method (CRAM) is an example of a method that the Water Boards would approve in such situations.

6.6 Water Boards' Review and Approval for Applications for Individual Orders

This section reviews the criteria and requirements under the proposed Procedures associated with approving an application submitted to the Water Boards for the discharge of dredged or fill material to waters of the state, including wetlands.

Application Approval Criteria

The proposed Procedures specify environmental criteria that would be used in evaluating applications. These criteria are consistent with State Water Board Resolution 68-16, "Statement of Policy with Respect to Maintaining High Quality of Waters in California," all discharges of waste would be regulated by the Water Boards to achieve the highest quality consistent with the maximum benefit to the people of the state.

The following four environmental criteria are the prerequisites that the Water Boards would consider under the proposed Procedures when approving applications for individual projects.

"The permitting authority will evaluate the potential impacts on the aquatic environment from the proposed project and determine whether the proposed project complies with these Procedures. The

permitting authority has discretion to approve a project only if the applicant has demonstrated the following:

1. *A sequence of actions has been taken to first avoid, then minimize, and lastly compensate for adverse impacts to waters of the state;*
2. *The potential impacts will not contribute to a net loss of the overall abundance, diversity, and condition of aquatic resources in the watershed;*
3. *The discharge of dredged or fill material will not violate water quality standards and will be consistent with all applicable water quality control plans and policies for water quality control;*
4. *The discharge of dredged or fill material will not cause or contribute to significant degradation of the waters of the state."*

Noncompliance with any of these four requirements would provide the Water Boards with sufficient basis to deny an application. The applicant may be required to submit an alternatives analysis to establish that the first requirement has been met. The following is a review of the alternative analysis requirements and exemptions to this requirement as set forth in the proposed Procedures.

Alternatives Analysis Requirements

Water Board staff may request an alternatives analysis to determine that the discharge, as proposed, is the "least environmentally damaging practicable alternative" (LEDPA) that will achieve the basic project purpose. The amount of information necessary in the alternative analysis would be commensurate with the level of the projects impacts, i.e., more information would be required for projects with significant impacts; projects with minimal impacts may only need to describe avoidance and minimization measures. In cases when the Water Boards requires an alternatives analysis, a draft submittal is needed to deem an application complete; however, a finalized alternatives analysis is needed before a final Order can be issued. Current practice regarding the Alternatives analysis requirement across the Water Boards is inconsistent; some regions may require analyses for some or all projects, and some regions may not. Setting clear expectations for applicants as well as Water Board staff for when an alternatives analysis may be required will provide for a clearer regulatory path and greater certainty that waters of the state will be identified and protected from dredged or fill activities.

An alternative analysis documents that all on- and off-site practicable alternatives have been considered and adverse impacts have been avoided and minimized to the extent practicable. As stated in the state Guidelines, (Appendix A, Subpart B, section 230.10 (a)(2)), "An alternative is practicable if it is available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered."

Since both the Corps and the Water Boards may require an alternatives analysis, one of the following three project–level scenarios could apply:

1) *The Corps requires an alternatives analysis and the proposed discharge(s) is to federal waters only:* In this case, the Water Boards would defer to the Corps' determination of the adequacy of the analysis. However, the Water Boards could elect to make an independent determination of the adequacy of the alternatives if any of the following conditions would apply: *(1) the permitting authority was not provided an adequate opportunity to consult during the development of the Corps' alternatives analysis, (2) the Corps' alternatives analysis does not adequately address issues by the permitting authority during consultation, (3) additional analysis is required to comply with CEQA, water quality standards, or other requirements or (4) the project and all of the identified alternatives would not comply with water quality standards.* In these instances, Water Board staff would elevate the matter to the Executive Director or Executive Officer to determine if additional analysis would be required of project alternatives.

2) *The Corps requires an alternatives analysis and the proposed discharge(s) is to both federal and non-federal waters:* In rare instances, when a project impacts waters that are both inside and outside of federal jurisdiction, and an alternatives analysis is required by the Corps, the Waters Boards may require an applicant to supplement the alternative analysis to include the waters outside of federal jurisdiction.

3) *The Corps does not require an alternatives analysis or the proposed discharge(s) is to non-federal waters only:* In this case, the Water Boards may independently require an alternatives analysis. As discussed in section 5.1, Regulation of Discharges of Dredged or Fill Material in California, the Corps does not require an alternatives analysis in instances when the project pre-qualifies for a Corps issued General (e.g., Nationwide), or programmatic permit. In these instances the Corps satisfies all project review requirements under the federal Guidelines for the applicant, including a generalized alternatives analysis. This means that alternatives analyses are conducted at the programmatic level rather than at the individual project level. In order to protect waters of the state that may be vulnerable to dredged or fill impacts, the proposed Procedures would allow for the Water Boards to require an alternatives analysis on a case-by-case basis. However, given that general permits are issued for projects of low complexity with minimal impacts to aquatic resources, and the fact that the Corps has already completed a programmatic alternatives analysis for the class of activities subject to the permit, an alternatives analysis, if required, will likely be limited in scope.

As described above, there will be cases where Water Board staff would determine the adequacy of the alternatives analysis. In this review, the Water Boards would verify that the proposed project alternative

is the LEDPA in light of all of the potential direct, secondary (indirect), and cumulative adverse impacts on the physical, chemical, and biological elements of the aquatic ecosystem.

Alternative Analysis Exemptions

Regardless of the exemptions described below, when the Water Board acts as lead agency under CEQA, the Water Board may be required to consider project alternatives in the project's environmental document. For these projects, the Water Board may require an applicant to submit an alternatives analysis. Otherwise, applicants proposing project types would be exempted from submitting an alternatives analysis:

i. *The project includes a discharge(s) to waters of the U.S. only, and the project meets the terms and conditions of one or more Corps' General Permits that has been previously certified by the Water Boards. The permitting authority will verify that the project meets the terms and condition of the Corps' General Permit based on information supplied by the applicant.*

   The Water Boards have certified some Corps' issued general permits for specific classes of projects. For example, the Water Boards have issued General Orders for Regional General Permits for emergency projects and a General Order for a subset of Nationwide permits that are exempt for review under CEQA. If a project qualifies for one or more of these Water Board issued general orders, the project would be exempt from an alternatives analysis requirement.

ii. *The project includes a discharge(s) to waters of the state outside of federal jurisdiction, and the project would meet the terms and conditions of one or more Corps' General Permits that has been previously certified by the Water Boards, if all the discharges were to waters of the U.S. The permitting authority will verify that the project would meet the terms and conditions of the Corps' General Permit(s) if all discharges were to waters of the U.S. based on information supplied by the applicant.*

   If the project discharge is to waters outside of federal jurisdiction, but the project would met the terms of a pre-certified Corps permit as determined by the Water Boards based on information submitted by the applicant, then this exemption would apply.

iii. *The project cannot be located in an alternate location (e.g., bank stabilization projects). The permitting authority may, however, require an analysis of on-site alternatives that would minimize impacts to waters of the state.*

   Projects that must be located in a specific location to meet the basic project purpose would not be subject to a full alternatives analysis that would include off-site considerations. For example, bank stabilization projects are sometimes needed to implement erosion control or to stabilize stream or river banks due to storms, floods are other events. Water Board staff could ask the

applicant to consider on-site alternatives, such as bioengineering, that could stabilize banks while retaining and/or restoring ecological functions of an aquatic resource.

iv. *The project would be conducted in accordance with a watershed plan that has been approved by the permitting authority and analyzed in an environmental document that includes a sufficient alternatives analysis monitoring provisions, and guidance on compensatory mitigation opportunities*

As described in section 5.2, projects planned and mitigated in accordance with a watershed plan support the goals of the proposed Procedures to follow a watershed approach in mitigating project impacts. A watershed approach is an analytical process for evaluating the environmental effects of a proposed project and promotes decisions that support the sustainability or improvement of aquatic resources in the watershed. Watershed plans could include Habitat Conservation Plans (HCPs) and National Community Conservation Plans (NCCPs) that have taken into consideration impacts to aquatic resources and include compensatory mitigation opportunities for aquatic resources. Watershed plans would be approved by the Water Boards to ensure that these interests are incorporated into the plan before a project could use this exemption for the alternatives analysis requirement.

v. *The project is an Ecological Restoration and Enhancement Project.*

Applicants proposing Ecological Restoration and Enhancement Projects would be exempt from the alternatives analysis requirement. These projects are funded specifically to restore aquatic resources, and their beneficial uses.

Other Application Items Requiring Water Boards' Review and Approval

The following items would additionally require Water Board review and approval as part of the application process:

1. *The Waters Boards will rely on any Corps-approved wetland area delineation within the boundaries of waters of the U.S. For all other wetland area delineations, the Water Boards shall review and approve delineations that are preformed using methods described in Section III.*

As required by the proposed Procedures, an applicant will be required to submit wetland area delineation, when wetland areas are present, using wetland delineation procedures that are outlined in section 6.4. The Water Boards will rely on the Corps' determination of the extent of wetlands within the applicant's project boundaries that are waters of the United States.

In any event, the applicant should consult with the Water Board to determine if any wetland features on the project site would be regulated by the Water Boards. Not every wetland feature is necessarily a water of the state. Whether a particular wetland feature, as defined in the proposed

Procedures, is deemed jurisdictional by the Water Boards must be decided on a case-by-case basis. Water Board staff will depend on analysis and maps submitted with the wetland area delineation report to determine the extent of wetlands that may be regulated by the Water Boards. In this regard, Water Boards' staff may request the applicant to delineate wetland areas that are outside of federal jurisdiction if also present within the project boundaries.

2. *Prior to issuance of the Order, the permitting authority will review and approve the final restoration plan for temporary impacts.*

If an applicant has proposed to temporarily impact waters of the state, and a restoration plan to return those waters to pre-project conditions is required as part of a complete application, the Water Boards will review and approve the restoration plan and incorporate it as part of the final Order.

3. *Compensatory Mitigation*

The proposed Procedures would require that the Water Boards consider the following items when determining compensatory mitigation requirements and the sufficiency of a draft compensatory mitigation plan. In general, the proposed Procedures adopt criteria used by the Corps in the federal Guidelines for making compensatory mitigation determinations.

a. *Compensatory mitigation, in accordance with the State Supplemental Dredged or Fill Guidelines, Subpart J, may be required to ensure that an activity complies with these Procedures.*

Subpart J of the State Guidelines, *Compensatory Mitigation for Losses of Aquatic Resources,* defines Compensatory mitigation as follows: the restoration (re-establishment or rehabilitation), establishment (creation), enhancement, and/or in certain circumstances preservation of aquatic resources for the purposes of offsetting unavoidable adverse impacts which remain after all appropriate and practicable avoidance and minimization has been achieved.

b. *Where feasible, the permitting authority will consult and coordinate with any other public agencies that have concurrent mitigation requirements in order to achieve multiple environmental benefits with a single mitigation project, thereby reducing cost of compliance to the applicant.*

In some cases, an applicant may need to comply with compensatory mitigation requirements from a number of different agencies. Compensatory mitigation required by the Waters Boards and Corps compensate for impacts to waters of the state and/or waters of the U.S. Compensatory mitigation required by the California Department of Fish and

Wildlife or the U.S. Fish and Wildlife Service compensate for potential impacts to threatened or endangered species and critical habitat for those species. In some cases, when threatened or endangered species are known to be present in aquatic resources, compensatory mitigation requirements could overlap. In these instances, the Water Boards would facilitate interagency collaboration to align compensatory mitigation requirements with other agencies, if possible.

c. *Amount: The amount of compensatory mitigation will be determined on a project-by-project basis in accordance with the proposed Procedures, including the State Supplemental Dredged or Fill Guidelines, section 230.93(f). The permitting authority may take into account recent anthropogenic degradation to the aquatic resource, and the potential and existing functions and conditions of the aquatic resource. A minimum of one-to-one acreage or length of stream reach replacement is necessary to compensate for wetland or stream losses unless an appropriate function or condition assessment method clearly demonstrates, on an exceptional basis, that a lesser amount is sufficient. A reduction in the mitigation ratio for compensatory mitigation will be considered by the permitting authority if buffer areas adjacent to the compensatory mitigation are also required to be maintained as part of the compensatory mitigation management plan. The amount of compensatory mitigation required by the permitting authority will vary depending on which of the following strategies the applicant uses to locate the mitigation site within a watershed.*

General Considerations: The amount of compensatory mitigation required by the Water Boards would be the amount necessary to compensate for aquatic resource losses that is sufficient in replacing the full range of aquatic resources and/or functions of the aquatic resource. Functions are the physical, chemical, and biological processes that occur in ecosystems. In general, compensatory mitigation projects that are fully established prior to the adverse impacts to aquatic resource(s) will require a lower amount of compensatory mitigation because there will be no temporal losses in aquatic functions and absolute certainty in the success of the compensatory mitigation project. Similarly, compensatory mitigation projects that are implemented prior to or concurrent with the adverse impacts to aquatic resource(s) will generally require a lower amount of compensatory mitigation because temporal losses in aquatic functions will be lower and certainty in the success in the compensatory mitigation project will be greater. In addition, compensatory mitigation projects that take a relatively long time to develop a full range of functions will require a greater amount of compensatory mitigation to account for temporal losses in aquatic functions.

In-kind mitigation is preferred and will generally require a lower amount of compensatory mitigation because it provides greater assurance that the full range of lost aquatic resource(s) and/or functions will be replaced. Locational factors, such as proximity to the impact site, hydrological conditions, soil characteristics, adjacent land uses, and biological conditions, will affect the level of certainty that a compensatory mitigation project will replace lost acres, functions, and services (i.e., likelihood of success).

Compensatory mitigation projects with a high likelihood for success will generally require a lower amount of compensatory mitigation because a high likelihood of success will ensure no overall net loss and achieve a long-term net gain in the aquatic resource acres, functions and services. For instance, mitigation projects located in close proximity and within the same watershed as the impacted aquatic resources will generally require a lower amount of mitigation. Lastly, impacts to aquatic resources with potentially medium to high level of aquatic functions will require a greater amount of compensatory mitigation.

Buffers: Compensatory mitigation projects that include buffers will generally require a lower amount of compensatory mitigation because risk and failure will be lower when buffers are provided. The proposed Procedures allow for buffer areas to be included as a component of compensatory mitigation, to ensure the ecological sustainability of a compensatory mitigation site, when necessary. Buffers are important to ensuring the long-term viability of aquatic resources and may provide habitat and wildlife corridors that improve the ecological functioning of an aquatic resource. In order for buffer areas to be considered as a component of compensatory mitigation, those buffer areas would need to be maintained and protected in long-term management plans.

Watershed Approach: In addition to condition assessments and buffer area components, the Water Boards will take into consideration the application of the watershed approach. As a component of a draft compensatory mitigation plan, an applicant must submit a watershed profile which contains data on the abundance, diversity and condition of aquatic resources in a project evaluation area sufficient to provide information to evaluate direct, secondary (indirect), and cumulative impacts of a project and compensatory mitigation alternatives on sustaining and enhancing the aquatic resources in the watershed. The Water Boards will take into consideration the following two strategies when determining compensatory mitigation amounts based on the applicant submittal of a watershed profile.

Strategy1: Applicant locates compensatory mitigation using a watershed approach based on a watershed profile developed from a watershed plan that has been approved by the permitting authority and analyzed in an environmental document, includes monitoring provisions, and includes guidance on compensatory mitigation opportunities;

Strategy 2: Applicant locates compensatory mitigation using a watershed approach based on a watershed profile developed for a project evaluation area, and demonstrates that the mitigation project will contribute to the sustainability of watershed functions and the overall health of the watershed area's aquatic resources.

Generally, the amount of compensatory mitigation required under Strategy 1 will be less than the amount of compensatory mitigation required under Strategy 2 since the level of certainty that a compensatory mitigation project will meet its performance standards increases if the compensatory mitigation project complies with a watershed plan as described above. Certainty increases when there is a corresponding increase in understanding of watershed conditions, which is increased when using a watershed plan as described above to determine compensatory mitigation requirements.

The Water Boards aim to sustain and enhance the quality and quantity of aquatic resources within watersheds by applying the watershed approach to strategically select compensatory mitigation sites. As stated above, by relying on a Water Board approved watershed plan, compensatory mitigation quantities for the applicant could be reduced due to a higher level of certainty that the compensatory mitigation project would improve the overall health of the watershed.

Minimum Mitigation Ratio: The minimum mitigation ratio establishes the baseline ratio which is then increased based on such factors as mentioned above (e.g., risk, type and location of compensatory mitigation). Normally, a minimum quantity of one-to-one ratio of impacted waters to areas restored through compensatory mitigation is required. The Water Boards could consider a mitigation ratio of less than one-to-one, but upon adoption of the proposed Procedures, a lesser ratio will be considered "on an exceptional basis." Given the uncertainties associated with mitigation (as described in section 5.2 *Impacts of Compensatory Mitigation*), there is a relatively heavy burden on applicants to clearly demonstrate that mitigation less than a one-to-one would compensate for the proposed impacts. Examples of factors that individually, or in combination with other factors, may lead to consideration of a less that one-to-one minimum mitigation ratio by the Water Boards, include:

- Where condition assessments of the mitigation site and the impact site a significant lift in functional capacity within the watershed based on an analysis of attainable condition at both sites. A significant increase in functional capacity is indicated when there is a categorical difference in assessed condition scores at the mitigation site and the impact site (e.g., "good condition" offsetting "poor condition"). If this is the case, the mitigation project must also demonstrate a high likelihood of

achieving its performance standards. Operationally, a site's attainable condition may be evaluated by considering the ecological stressors impacting the site and whether those stressors may be expected to naturally continue or dissipate in the near future, or be ameliorated without much difficulty or cost.

- Where mitigation projects include maintenance of substantial buffers to protect the mitigation as part of the mitigation plan, because those buffers are not included in the calculation of the ratio.
- Where mitigation projects include multiple benefits, such as addressing climate change, sea level rise, or similar issues, as long as those issues are not related to impacts of the project, and
- Where mitigation projects are part of a watershed plan, if the mitigation project when evaluated in conjunction with other nearby mitigation projects in the watershed plan, has additional cumulative watershed benefits.

Mitigation Ratio Factoring. The Water Boards intend to implement standardized procedures to determine compensatory mitigation requirements which are open and transparent to the applicant. It will be consistent with the procedures developed by the South Pacific Division of the Corps for determining and documenting mitigation ratios (Regulatory Program Standard Operating Procedures for Determination of Mitigation Ratios[56]), but will also include consideration of the additional factors discussed above. In the Corps procedures, the following factors are evaluated using a "checklist" approach to adjust the mitigation ratio:

- Quantitative or qualitative impact-mitigation comparison: The mitigation ratio is adjusted based on the degree of gain in aquatic resource function and condition. A comparison of the sites is made quantitatively based on field scores from an approved function/condition assessment method, or qualitatively by assessing the functional loss at the impact site verses expected functional gain at the mitigation site.
- Mitigation site location – Generally, a lower ratio is prescribed when mitigation is located within the same watershed as the impacted aquatic resource since to would replace the permanent loss of aquatic resource functions and beneficial uses. An increase in the mitigation ratio would be justified if the mitigation was located outside of the watershed to account for permanently removing the aquatic resource unless it is determined that the proposed mitigation is ecologically preferable.
- Net loss of aquatic resource surface area – The mitigation ratio is adjusted based on the compensatory mitigation method since compensatory mitigation in the form of

[56] Special Public Notice: "Standard Operating Procedure for Determination of Mitigation Ratios" U.S. Army Corps of Engineers, South Pacific Division, February 20, 2012

establishment (creation) or re-establishment results in a gain of area and a gain in function; compensatory mitigation in the form of rehabilitation or enhancement results in a gain of function only; mitigation in the form of preservation results in neither a gain of area or a gain in function. Thus, the latter method of compensatory mitigation would require the highest increase in the mitigation ratio, while the first method would result in the least increase.

- Type conversion – Out-of-kind mitigation is compensatory mitigation that replaces a resource that is structurally and functionally different from the impacted aquatic resource. For out-of-kind mitigation generally a higher mitigation ratio is prescribed unless the mitigation is ecologically preferable based on aquatic resource needs in the greater ecoregion.
- Risk and uncertainty – The ratio is adjusted to reflect the uncertainty mitigation sucess. Factors considered include, but are not limited to, whether the mitigation is permittee responsible, difficulty of replacement (e.g., vernal pools, streams) modified hydrology or artificial hydrology, supporting structures requiring long-term maintenance (e.g., bank stabilization, outfalls), planned vegetation maintenance, and absence of a long-term preservation mechanism.
- Temporal loss – Temporal loss describes the time lag between the loss of aquatic resource functions caused by permanent or temporary impacts and the timing of the replacement of aquatic resource functions at the compensatory mitigation site. If temporal loss is expected, a higher mitigation ratio is prescribed. If compensatory mitigation is established before a proposed impact, such as at a mitigation bank, temporal loss would not be considered.

Other factors that could be taken into consideration when determining mitigation ratios might include: (1) mitigation projects that include maintenance of substantial buffers to protect the mitigation as part of the mitigation plan, because those buffers are not included in the calculation of the ratio, (2) mitigation projects that have multiple benefits, such as addressing climate change, sea level rise, or similar issues, as long as those issues are not related to impacts of the project, and (3) mitigation projects that are part of a watershed plan, if the mitigation project, when evaluated in conjunction with other nearby mitigation projects in the watershed plan, has additional cumulative watershed benefits.

d. ***Type and Location:*** *The permitting authority will evaluate the applicant's proposed mitigation type and location based on the applicant's use of a watershed approach based on a watershed profile. If a proposed project may affect more than one watershed, then the permitting authority may determine that locating all required project mitigation in one area is ecologically preferable to requiring mitigation within each watershed, based on watershed conditions, impact size, location and spacing, aquatic resource values, relevant watershed plans and other considerations.*

The proposed Procedures would require that the Water Boards determine that the compensatory mitigation type and location is the most environmentally-preferable by applying the watershed approach to the extent appropriate and practicable. The proposed Procedures provide that the Water Boards may approve all required compensatory mitigation in one area within the larger region if the proposed project impacts more than one watershed while taking into consideration watershed conditions, impact size, location and spacing, aquatic resource values, watershed plans and other considerations. Compensatory mitigation should be located where it is most likely to successfully replace the lost functions and services of the impact site, taking into account the watershed profile.

As described in the state Guidelines, the following compensatory mitigation types would be considered: 1) mitigation banks, 2) In-Lieu fee programs, and 3) permittee responsible mitigation. The state Guidelines further provide for a preference hierarchy, with the highest preference given to mitigation banks , and then in-lieu fee programs; permittee-responsible under a watershed approach; permittee-responsible through on-site and in-kind mitigation; and lastly, permittee-responsible off-site and/or out-of-kind. This is considered a "soft preference" because any mitigation type may override the preferred type if that mitigation type will result in greater benefits to the condition of aquatic resources in the watershed.

e. <u>Final Compensatory Mitigation Plan:</u> The permitting authority will review and approve the final compensatory mitigation plan submitted by the applicant to ensure mitigation comports with the State Supplemental Dredged or Fill Guidelines Water Code requirements, applicable water quality standards, and other appropriate requirements of state law. The level of detail in the final plan shall be sufficient to accurately evaluate whether compensatory mitigation offsets the adverse impacts attributed to a project considering the overall size and scope of impact. The compensatory mitigation plan shall be sufficient to provide the permitting authority with a reasonable assurance that replacement of the full range of lost aquatic resource(s) and/or functions will be provided in perpetuity.

As part of a complete application, the applicant would have already submitted a draft compensatory mitigation plan. Water Board staff will review the draft mitigation plan to ensure all components have been addressed and finalized, including the amount, type, and location of compensatory mitigation. A final compensatory mitigation plan will be adopted as part of the final Order issued by the Water Boards.

If circumstances require that an Order be issued before a compensatory mitigation plan can be finalized, the applicant would need to obtain final approval from the Water Board before

impacting waters of the state. In these cases, a final mitigation plan will be approved by amending the Order.

f. Financial Security: Where deemed necessary by the permitting authority, provision of a financial security (e.g., letter of credit or performance bond) shall be a condition of the Order. In this case, the permitting authority will approve the financial security to ensure compliance with compensatory mitigation plan requirements.

In some cases, the Water Boards may require the applicant provide financial security to ensure a high level of confidence that the compensatory mitigation project will be completed, successfully. Financial assurances could be provided in the form of a letter of credit, a performance bond, escrow accounts, or casualty insurance.

g. Term of Mitigation Obligation: The permitting authority may specify in the Order the conditions that must be met in order for the permitting authority to release the permittee from the mitigation obligation, including compensatory mitigation performance standards and long term management funding obligations.

The Water Boards may include conditions in an Order that would release the permittee from any further compensatory mitigation obligations. A release may be considered by the Water Boards after a real-estate instrument is in place to protect the site in perpetuity, all performance standards agreed to in the compensatory mitigation plan have been met, and an endowment fund has been provided to ensure the long term management and protection of the aquatic resource site in perpetuity. If site-specific environmental factors are present that may jeopardize the condition of the mitigation site, then these concerns must be addressed in the compensatory mitigation plan prior to releasing the permittee from the mitigation obligation.

h. The permitting authority shall provide public notice in accordance with Water Code section 13167.5 for waste discharge requirements. The permitting authority shall provide public notice of an application for water quality certification in accordance with California Code of Regulations, title 23, section 3858. If the permitting authority receives comments on the application or there is substantial public interest in the project, the permitting authority shall also provide public notice of the draft Order, or draft amendment of the Order, unless circumstances warrant a shorter public notice period.

Water Code section 13167.5 requires that a draft WDR is made available to the public for a 30 day comment and review period before the draft Order is taken in front of the Board for adoption. The California Code of Regulations, title 23, section 3858 requires that applications for 401 certifications are made available to the public for a 21 public review and comment period.

The proposed Procedures would better align public noticing requirements and created a single administrative process for the State and Regional Water Boards to follow. Currently, there is not a standard for public noticing 401 certifications and each Water Board's public notice varies in regard to content and timing. Some Water Boards issue public notices once an application is received, while others once an application is deemed complete. In addition, by making the draft Order available for public review and comment, the Water Boards aim to increase public involvement and transparency by providing a draft document that clarifies how the project would be regulated by the Water Board.

a. *The permitting authority will review and approve the final monitoring and reporting requirements for all projects. Monitoring and reporting may be required to demonstrate compliance with the terms of the Order.*

Monitoring and reporting requirements will be included in Orders to ensure that dischargers are complying with conditions set forth on an approved Order. In addition, monitoring and reporting allows the Water board to track the status of project requirements that could take a number of years to complete.

General Orders

General orders are designed to regulate activities that are similar in nature and have minimal impacts to aquatic resources. General orders serve to streamline certification procedures for the applicant and to reduce staff workload for the Water Boards. For dredged or fill projects, the Water Boards have issued certifications for a number of Corps general permits. Examples include certifications for regional general permits, emergency projects, and a subset of Nationwide permits that the Water Boards have determined are exempt from review under CEQA.

The proposed Procedures do not add any new requirements for general orders.

Applicants that wish to enroll under a general order would follow current practice and file a notice of intent with the appropriate Water Board by following the directions and conditions outlined in that specific general order. The Water Boards will review the notice of intent to ensure that the proposed project falls within the requirements of the general order.

Activities and Areas Excluded from the Application Procedures for Regulation of Discharges of Dredged or Fill Material to Waters of the State

As discussed below, the proposed Procedures exempt certain areas and activities from the application procedures in order to better align the Water Board's dredged or fill program with the federal CWA section 404 program. It is important to note that these areas and activities, although exempt from these application procedures, are not exempt from other Water Board regulatory authorities. Therefore, discharges into waters of the state within these areas or through these activities may be permitted under other Water Board policies, plans, or orders.

Agricultural Activities that are also exempt under CWA section 404(f)

Certain activities described in CWA section 404(f) are exempted from the Corps' permit requirements under CWA section 404. These same activities would be exempt from the application procedures of the proposed Procedures. Examples of activities include, but are not limited to, normal farming, ranching and silviculture activities; constructing and maintaining stock or farm ponds and irrigation ditches; constructing or maintaining farm, forest, or mining roads; maintaining or reconstructing structures that are currently serviceable; and constructing temporary sedimentation basins for construction.

Suction Dredge Mining Activities

Suction dredge mining activities for mineral recovery regulated under section 402 of the CWA would be exempt from the application procedures.

Prior Converted Cropland (PCC)

A PCC is a farmed area that has been drained or filled by 1975, and converted to dry land no longer exhibiting wetland characteristics. PCC's are not regulated under CWA section 404. Likewise, the proposed Procedures would exempt PCCs that have been certified by the Natural Resources Conservation District. However, if a PCC changes to a non-agricultural use, or the PCC is abandoned and left idle for more than five years, the exemption would not apply. In this case, any areas exhibiting wetland characteristics would be subject to the proposed Procedures.

Constructed Treatment Wetlands

The proposed Procedures would exempt dredged or fill activities in a constructed treatment wetland if it is located in an area that did not historically support wetlands or other aquatic resources, and it was not constructed as compensatory mitigation for wetland impacts.

Appropriation of Water through the Division of Water Rights

Activities associated with an appropriation of water, a hydroelectric facility which requires a Federal Energy Regulatory Commission (FERC) license, or amendment to a FERC license, or any other diversion of water for beneficial use *could* be exempt from the application procedures outlined in the proposed Procedures. The Division of Water Rights retains the discretion to apply the proposed Procedures to projects that fall under their regulatory authority.

6.7 Definitions

The proposed Procedures contain two sets of definitions: one pertains to the body of the proposed Procedures, and a second pertains to the state Guidelines. The state Guideline definitions are retained from the definitions of the federal Guidelines. In addition, if there is a term not defined in the proposed

Procedures, but is defined in the Water Code and/or the California Code of Regulations, then the definitions in those regulations would apply to the proposed Procedures.

6.8 Appendix A: State Supplemental Dredged or Fill Guidelines

The proposed Procedures include the state Guidelines as an appendix. The intent of the state Guidelines is to align Water Board dredged or fill requirements with federal requirements, to the extent practicable. The text in the state Guidelines is retained from the federal Guidelines to avoid conflicting regulations. Full integration of the federal Guidelines was not possible due to jurisdictional and procedural differences. The state Guidelines includes relevant sections of the federal Guidelines. Sections of the federal Guidelines were excluded that were redundant with, or were not relevant to, state regulation. Global edits were made to the federal Guidelines to make them applicable to state regulation, such as "District engineer" has been changed to "permitting authority." However, the integrity of the state Guidelines is maintained because it includes only text from the federal Guidelines; no additional language was added.

6.9 Project Location

Compliance with the proposed Procedures will be carried out in the state of California and will be implemented through the Regional Water Quality Control Boards' or the State Water Board, if the project would cross Regional Board Boundaries. The Regional Water Boards are defined (for the most part[57]) by the boundaries of hydrologic regions, as described in Water Code section 13200. The Water Code divides the state into nine hydrologic regions (Figure 3**Error! Reference source not found.**): 1) North Coast Region, 2) San Francisco Bay Region, 3) Central Coast Region, 4) Los Angeles Region, 5) Central Valley Region, 6) Lahontan Region, 7) Colorado River Basin, and 9) San Diego Region.

[57] The South Coast hydrologic region is divided among 3 Regional Water Boards (Los Angeles, Santa Ana, and San Diego) because it is the most populous area of the state.

Figure 3: Regional Water Board Jurisdictional Boundaries

North Coast Region

The North Coast Region (Figure 4) encompasses a total area of approximately 19,390 square miles, including 340 miles of coastline and remote wilderness areas, as well as urbanized and agricultural areas. The North Coast Region comprises all regional basins, including Lower Klamath Lake and Lost River Basins, draining into the Pacific Ocean from the California-Oregon state line southern boundary and includes the watershed of the Estero de San Antonio and Stemple Creek in Marin and Sonoma Counties. Two natural drainage basins, the Klamath River Basin and the North Coastal Basin divide the region. The region covers all of Del Norte, Humboldt, Trinity, and Mendocino Counties, major portions of Siskiyou and Sonoma Counties, and small portions of Glenn, Lake, and Marin Counties.

Beginning at the Smith River in northern Del Norte County and heading south to the Estero de San Antonio in northern Marin County, the Region encompasses a large number of major river estuaries. Other north coast streams and rivers with significant estuaries include the Klamath River, Redwood Creek, Little River, Mad River, Eel River, Noyo River, Navarro River, Elk Creek, Gualala River, Russian River and Salmon Creek (this creek mouth also forms a lagoon). Northern Humboldt County coastal lagoons include Big Lagoon and Stone Lagoon. The two largest enclosed bays in the North Coast Region are Humboldt Bay and Arcata Bay (both in Humboldt County). Another enclosed bay, Bodega Bay, is located in Sonoma County near the southern border of the Region.

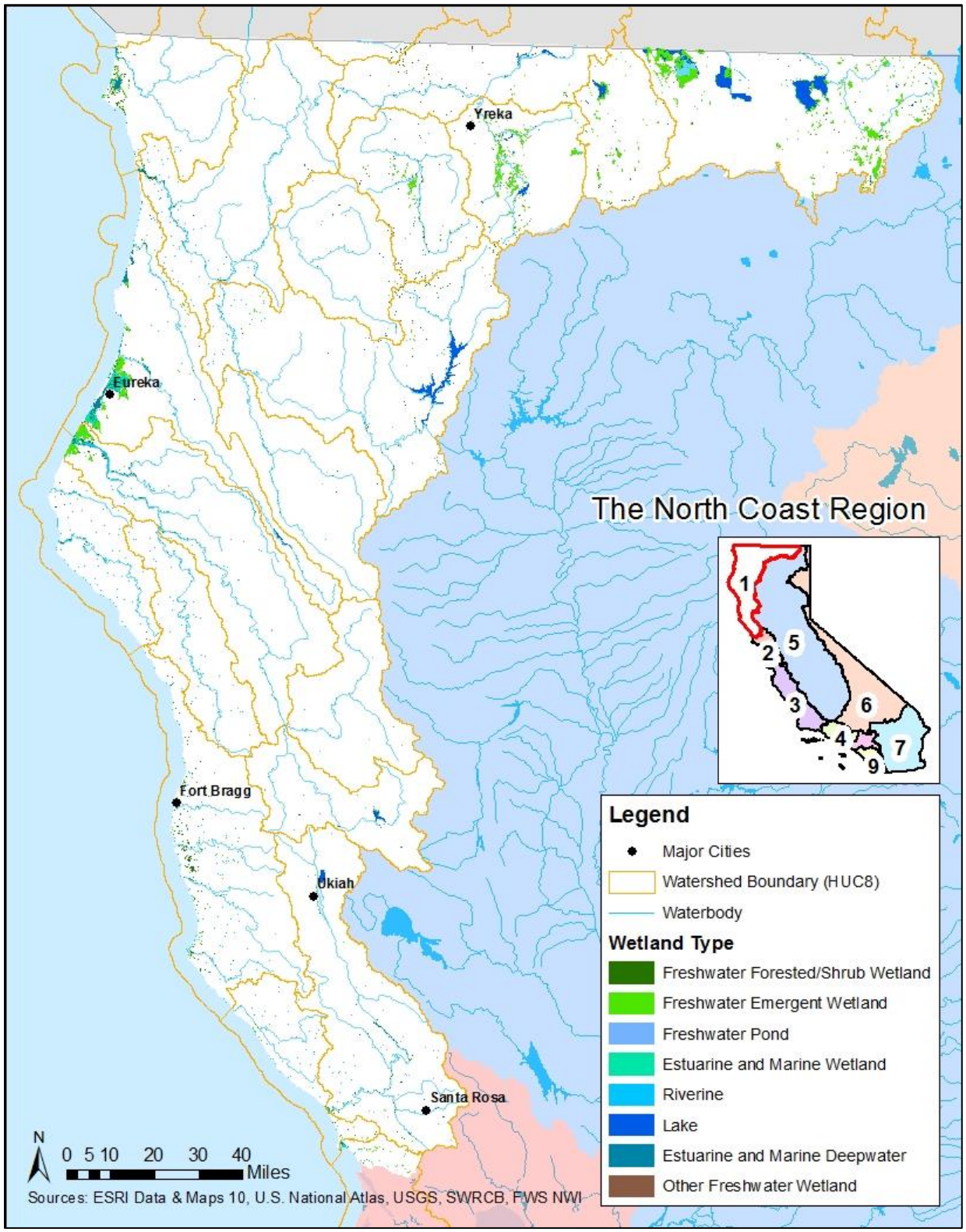


Figure 4: North Coast Region

San Francisco Bay Region

The San Francisco Bay Region (Figure 5) has jurisdiction over the part of San Francisco Estuary that includes all of San Francisco Bay segments extending east to the Delta (Winter Island near Pittsburg). The San Francisco Estuary marks a natural topographic separation between the northern and southern coastal mountain ranges.

The Region comprises San Francisco Bay, Suisun Bay beginning at the Sacramento River, and San Joaquin River westerly, from a line which passes between Collinsville and Montezuma Island. The Region's boundary follows the borders common to Sacramento and Solano counties and Sacramento and Contra Costa counties west of the Markely Canyon watershed in Contra Costa County. All basins west of the boundary, described above, and all basins draining into the Pacific Ocean between the southern boundary of the North Coast Region and the southern boundary of the watershed of Pescadero Creek in San Mateo and Santa Cruz counties are included in the Region.

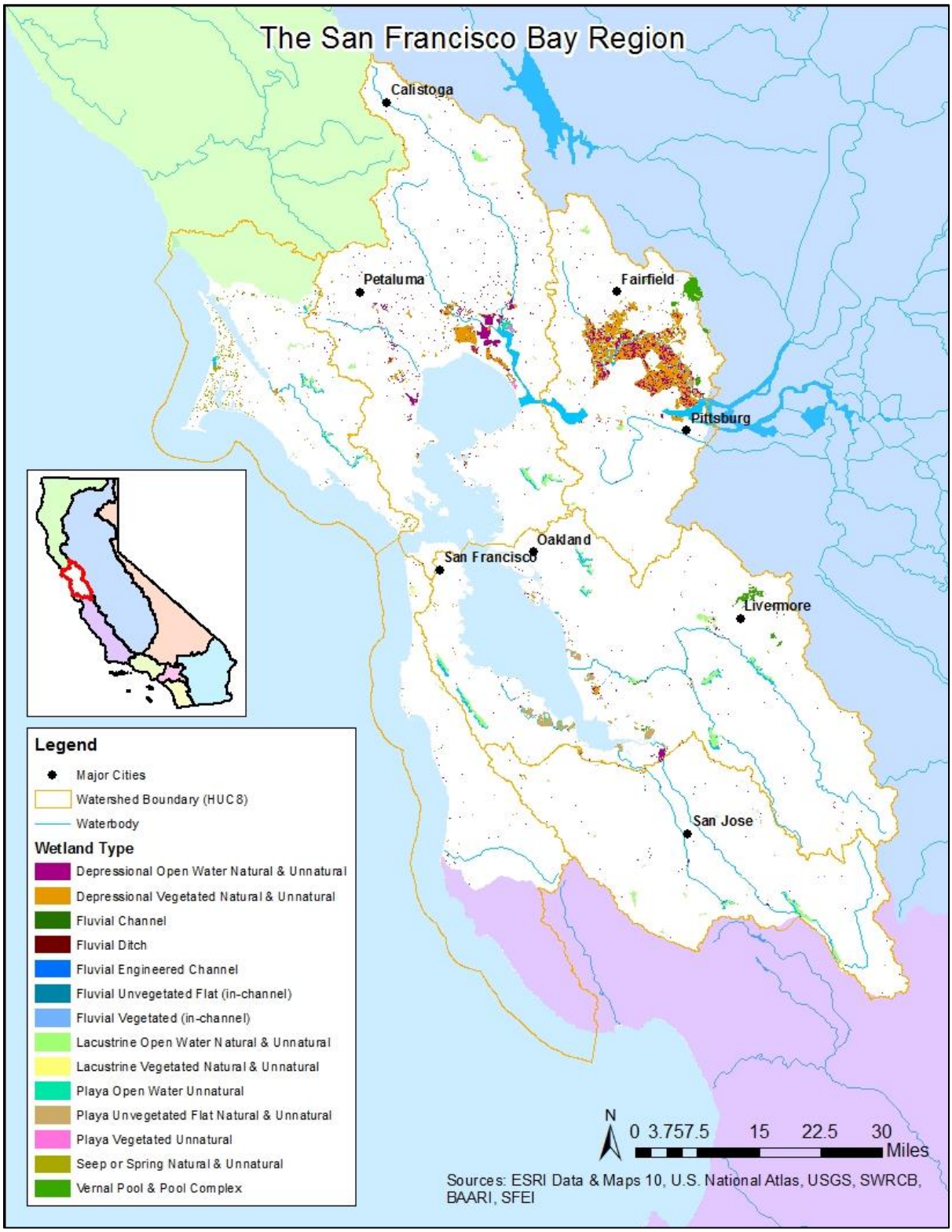


Figure 5: San Francisco Bay Region

Central Coast Region

The Central Coast Region (Figure 6) comprises all basins (including Carrizo Plain in San Luis Obispo and Kern Counties) draining into the Pacific Ocean from the southern boundary of the Pescadero Creek watershed in San Mateo and Santa Cruz Counties to the southeastern boundary of the Rincon Creek watershed, located in western Ventura County. The Region extends over a 300-mile long by 40-mile wide section of the State's central coast.

This Region's geographic area encompasses all of Santa Cruz, San Benito, Monterey, San Luis Obispo, and Santa Barbara Counties as well as the southern one-third of Santa Clara County, and small portions of San Mateo, Kern, and Ventura Counties. Included in the Region are urban areas such as the Monterey Peninsula and the Santa Barbara coastal plain; prime agricultural lands such as the Salinas, Santa Maria, and Lompoc Valleys; National Forest lands; extremely wet areas such as the Santa Cruz Mountains; and arid areas such as the Carrizo Plain.

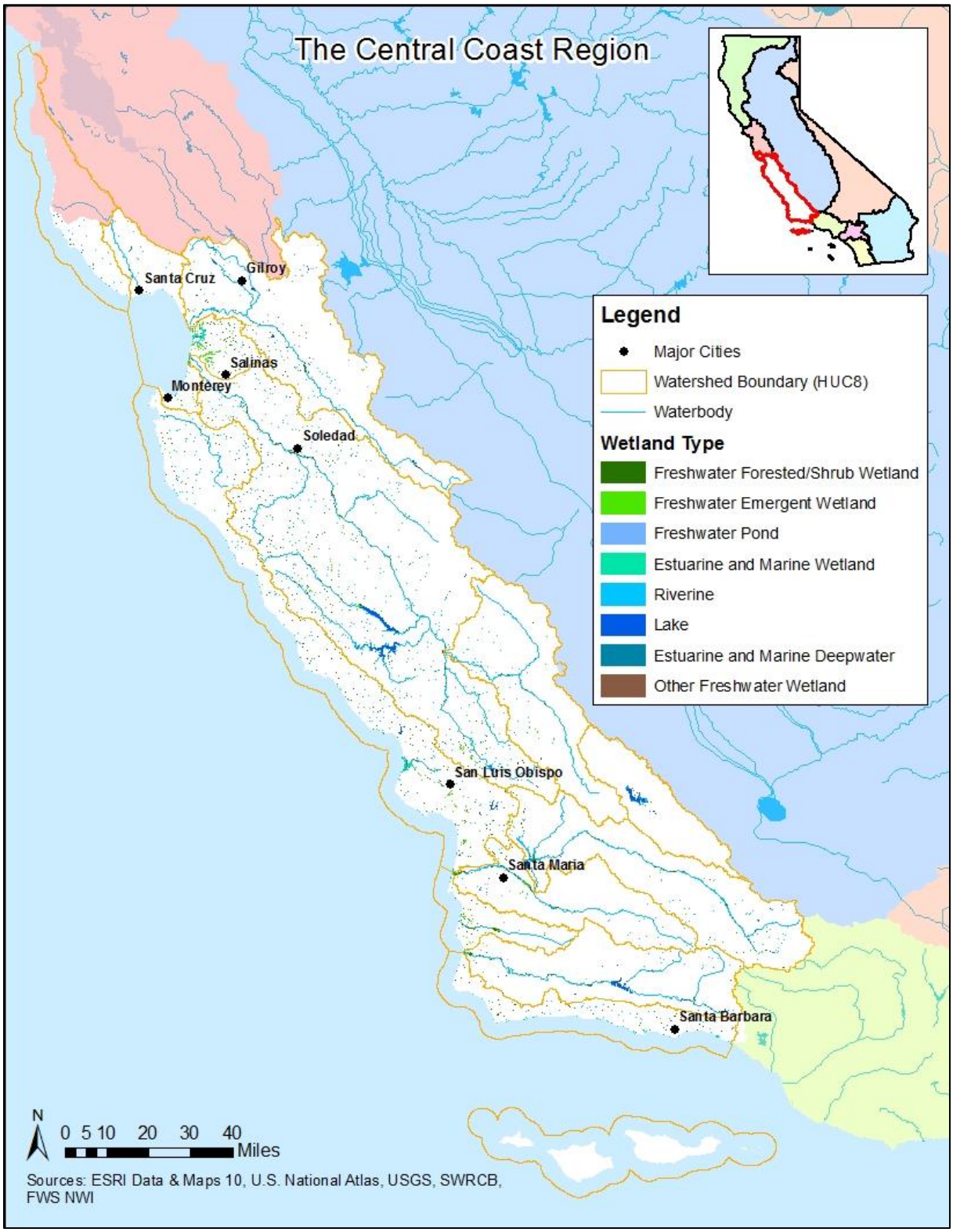


Figure 6: Central Coast Region

Los Angeles Region

The Los Angeles Region (Figure 7) comprises all basins draining into the Pacific Ocean between the southeastern boundary of the watershed of Rincon Creek, located in western Ventura County, and a line which coincides with the southeastern boundary of Los Angeles County, from the Pacific Ocean to San Antonio Peak, and follows the divide, between the San Gabriel River and Lytle Creek drainages to the divide between Sheep Creek and San Gabriel River drainages. It also includes the drainages of five coastal islands (Anacapa, San Nicolas, Santa Barbara, Santa Catalina and San Clemente). In addition, the Region includes all coastal waters within three miles of the continental and island coastlines.

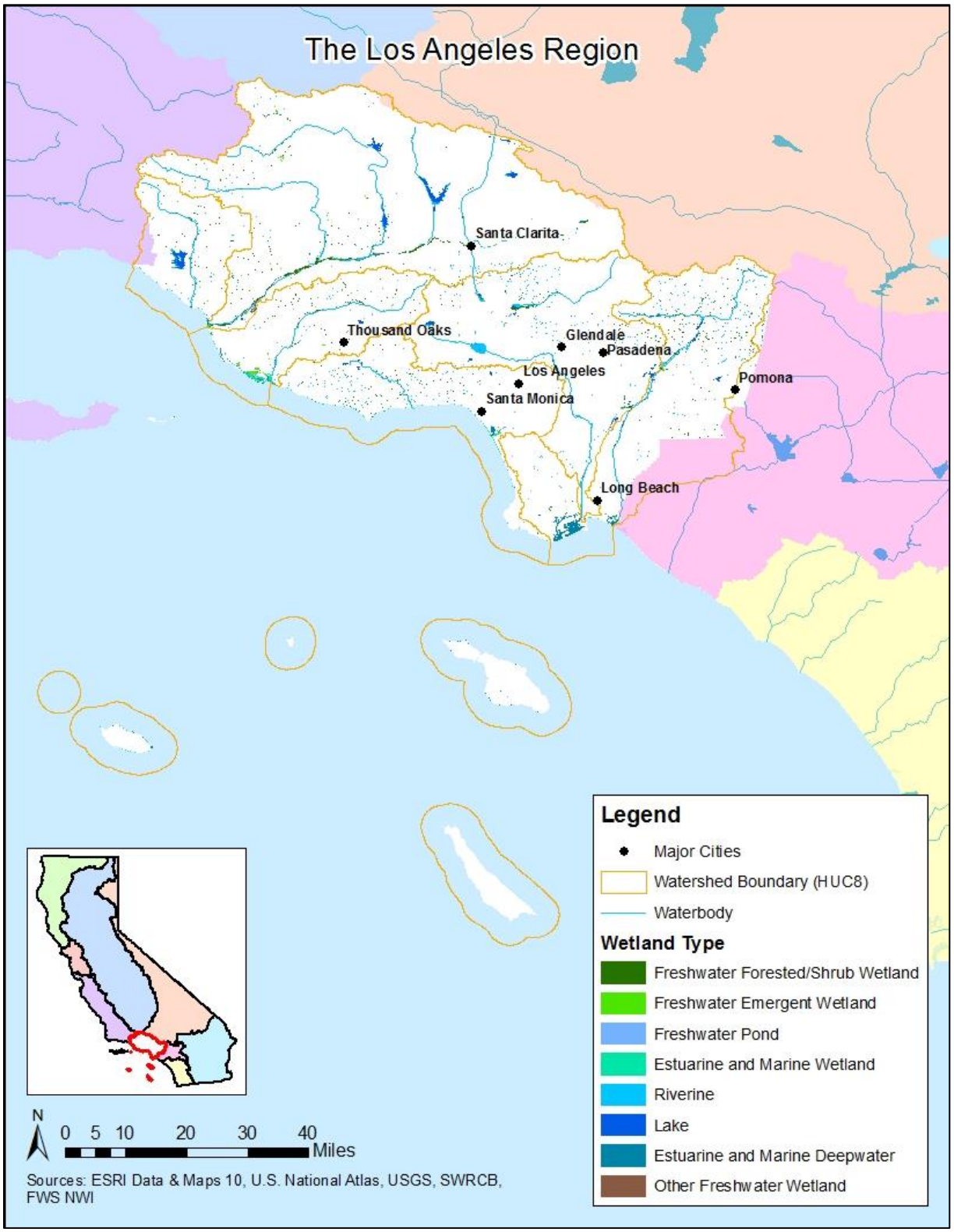


Figure 7: The Los Angeles Region

Central Valley Region

The Central Valley Region (Figure 8) is divided into three basins: Sacramento River, San Joaquin River, and Tulare Lake. For planning purposes, the Sacramento River Basin and the San Joaquin River Basin are covered under one Basin Plan and the Tulare Lake Basin is covered under a separate Basin Plan.

The Sacramento River Basin covers 27,210 square miles and includes the entire area drained by the Sacramento River. The principal streams are the Sacramento River and its larger tributaries: the Pitt, Feather, Yuba, Bear, and American Rivers to the east; and Cottonwood, Stony, Cache, and Putah Creek to the west. Major reservoirs and lakes include Shasta, Oroville, Folsom, Clear Lake, and Lake Berryessa.

The San Joaquin River Basin covers 15,880 square miles and includes the entire area drained by the San Joaquin River. Principal streams in the basin are the San Joaquin River and its larger tributaries: the Consumnes, Mokelumne, Calaveras, Stanislaus, Tuolumne, Merced, Chowchilla, and Fresno Rivers. Major reservoirs and lakes include Pardee, New Hogan, Millerton, McClure, Don Pedro, and New Melones.

The Tulare Lake Basin covers approximately 16,406 square miles and comprises the drainage area of the San Joaquin Valley south of the San Joaquin River. The planning boundary between the San Joaquin River Basin and the Tulare Lake Basin is defined by the northern boundary of Little Pinoche Creek basin eastward along the channel of the San Joaquin River to Millerton Lake in the Sierra Nevada foothills, and then along the southern boundary of the San Joaquin River drainage basin. Main rivers within the basin include the King, Kaweah, Tule, and Kern Rivers, which drains the west face of the Sierra Nevada Mountains. Imported surface water supplies enter the basin through the San Luis Drain- California Aqueduct System, Friant- Kern Channel and the Delta Mendota Canal.

The two northern-most basins are bound by the crests of the Sierra Nevada on the east and the Coast Range and Klamath Mountains on the west. They extend about 400 miles from the California-Oregon border southward to the headwaters of the San Joaquin River. Surface water from the two drainage basins meets and forms the Delta, which ultimately drains into the San Francisco Bay. The legal boundary of the Delta is described in California Water Code section 12220.

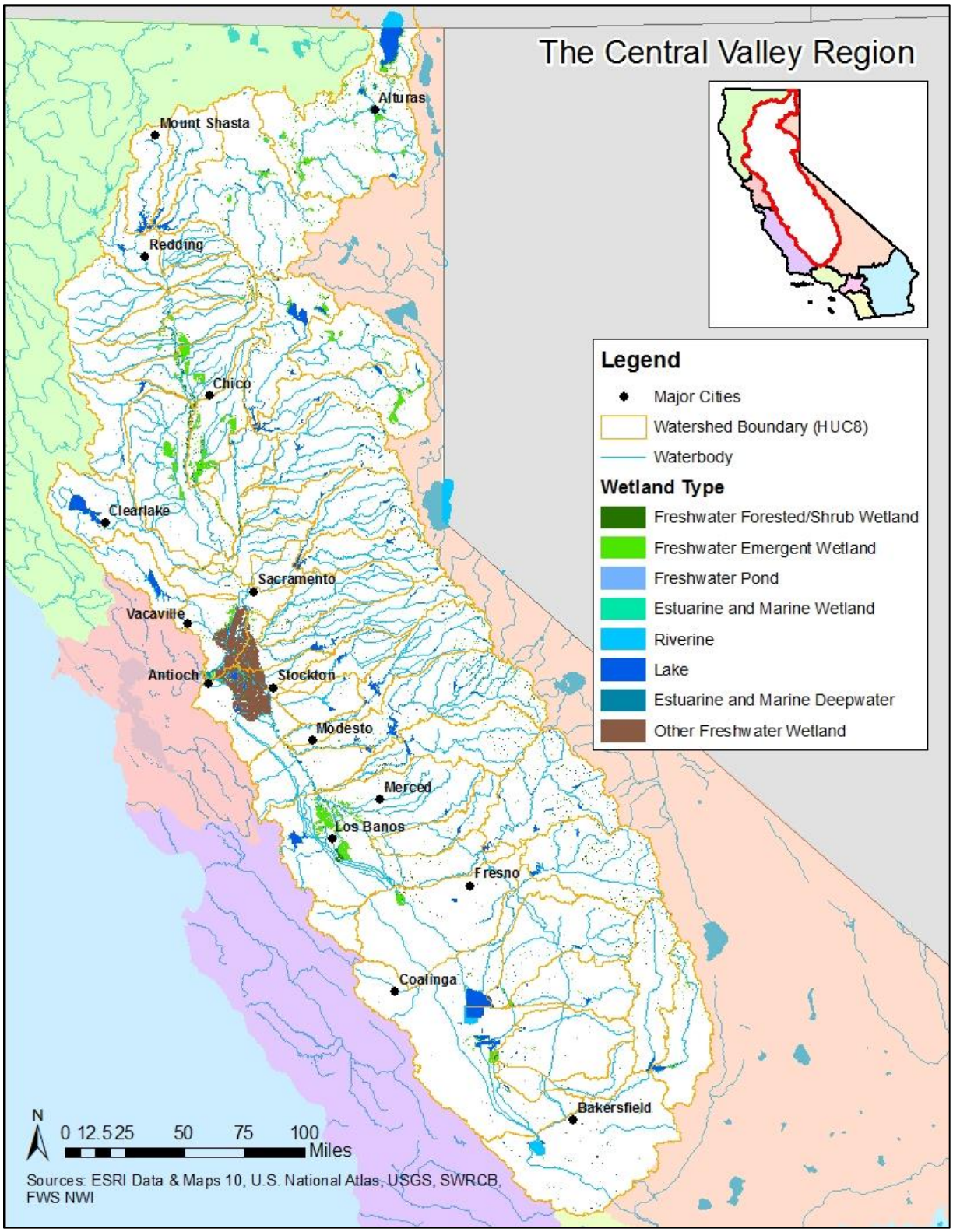


Figure 8: Central Valley Region

Lahontan Region

The Lahontan Region (Figure 9) has historically been divided into North and South Lahontan Basins at the boundary between the Mono Lake and East Walker River watersheds. It is about 570 miles long and has a total area of 33,131 square miles. The Region includes the eastern slopes of the Warner, Sierra Nevada, San Bernardino, Tehachapi and San Gabriel Mountains, and all or part of other ranges including the White, Providence, and Granite Mountains. Topographic depressions include the Madeline Plains, Surprise, Honey Lake, Bridgeport, Owens, Antelope, and Victor Valleys.

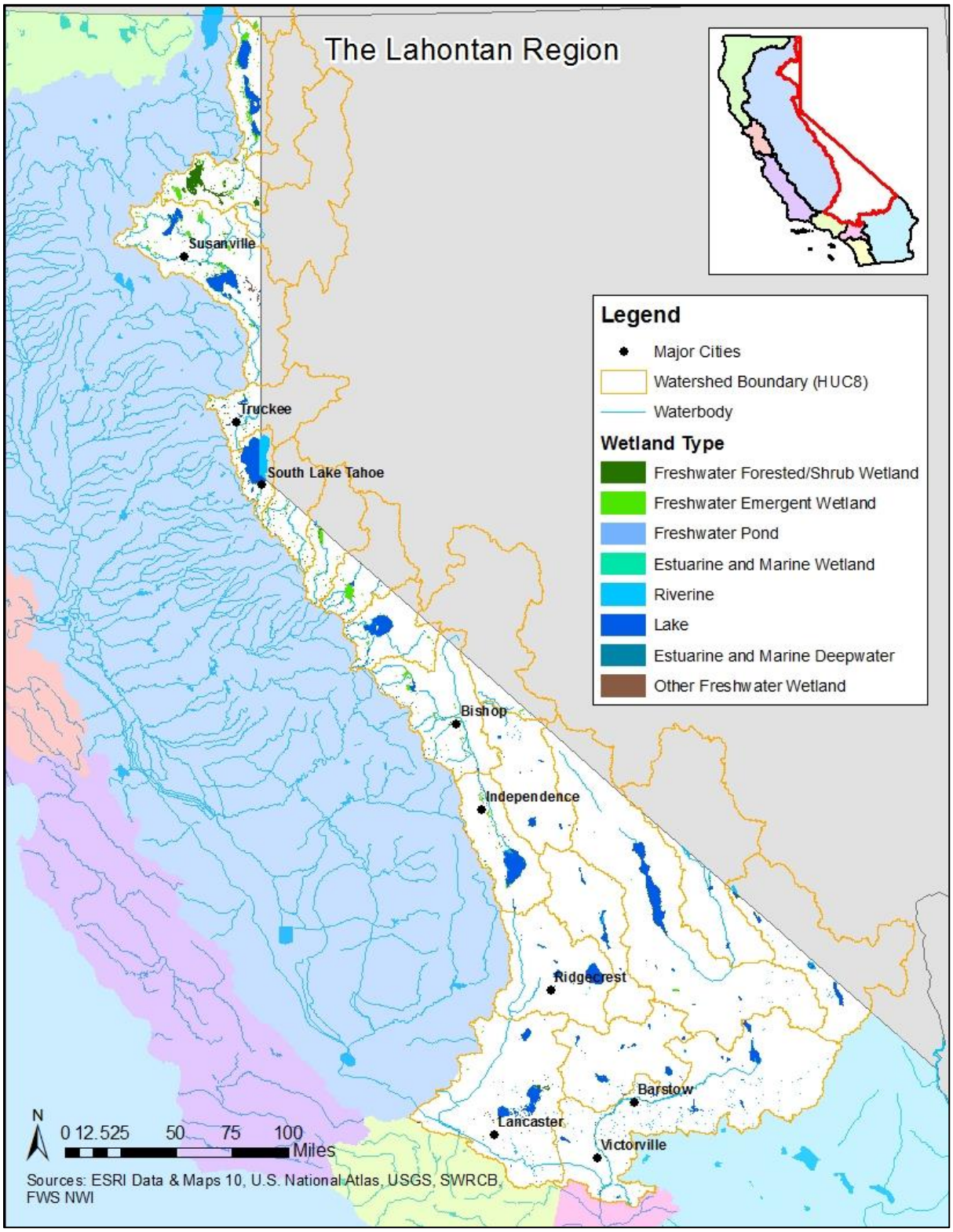


Figure 9: Lahontan Region

Colorado River Basin Region

The Colorado River Basin Region (Figure 10) covers approximately 13 million acres (20,000 square miles) in the southeastern portion of California. It includes all of Imperial County and portions of San Bernardino, Riverside, and San Diego Counties. It shares a boundary for 40 miles on the northeast with the State of Nevada, on the north by the New York, Providence, Granite, Old Dad, Bristol, Rodman, and Ord Mountain ranges, on the west by the San Bernardino, San Jacinto, and Laguna Mountain ranges, on the south by the Republic of Mexico, and on the east by the Colorado River and State of Arizona.

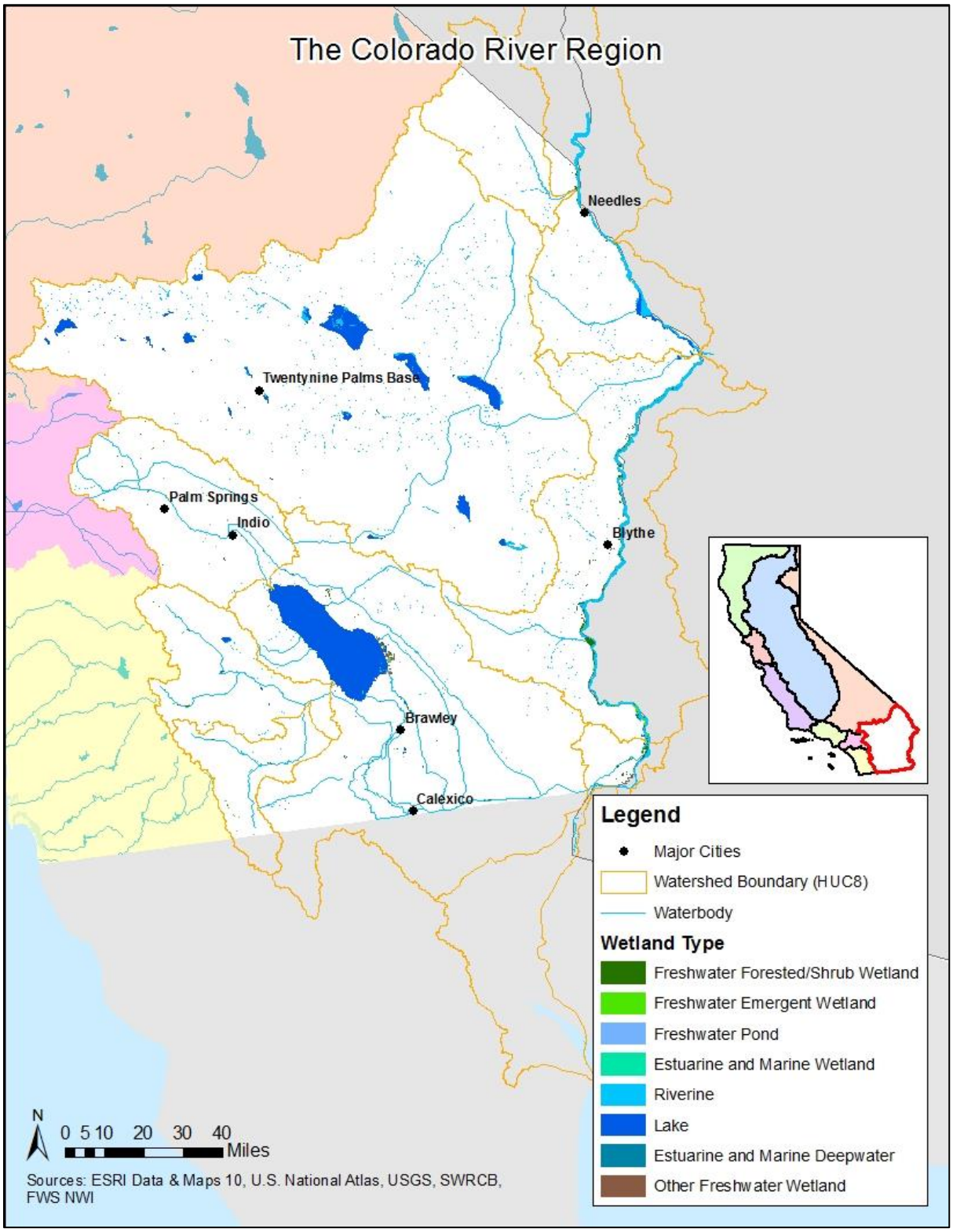


Figure 10: Colorado River Basin Region

Santa Ana Region

The Santa Ana Region (Figure 11) comprises all basins draining into the Pacific Ocean between the southern boundary of the Los Angeles Region and the drainage divide between Muddy and Moro Canyons, from the ocean to the summit of San Joaquin Hills; along the divide between lands draining into Newport Bay and Laguna Canyon to Niguel Road; along Niguel Road and Los Aliso Avenue to the divide between Newport Bay and Aliso Creek drainages; and along the divide and the southeastern boundary of the Santa Ana River drainage to the divide between Baldwin Lake and Mojave Desert drainages; to the divide between the Pacific Ocean and Mojave Desert drainages.

The Santa Ana Region is the smallest of the nine regions in the state (2,800 square miles) and is located in southern California, roughly between Los Angeles and San Diego.

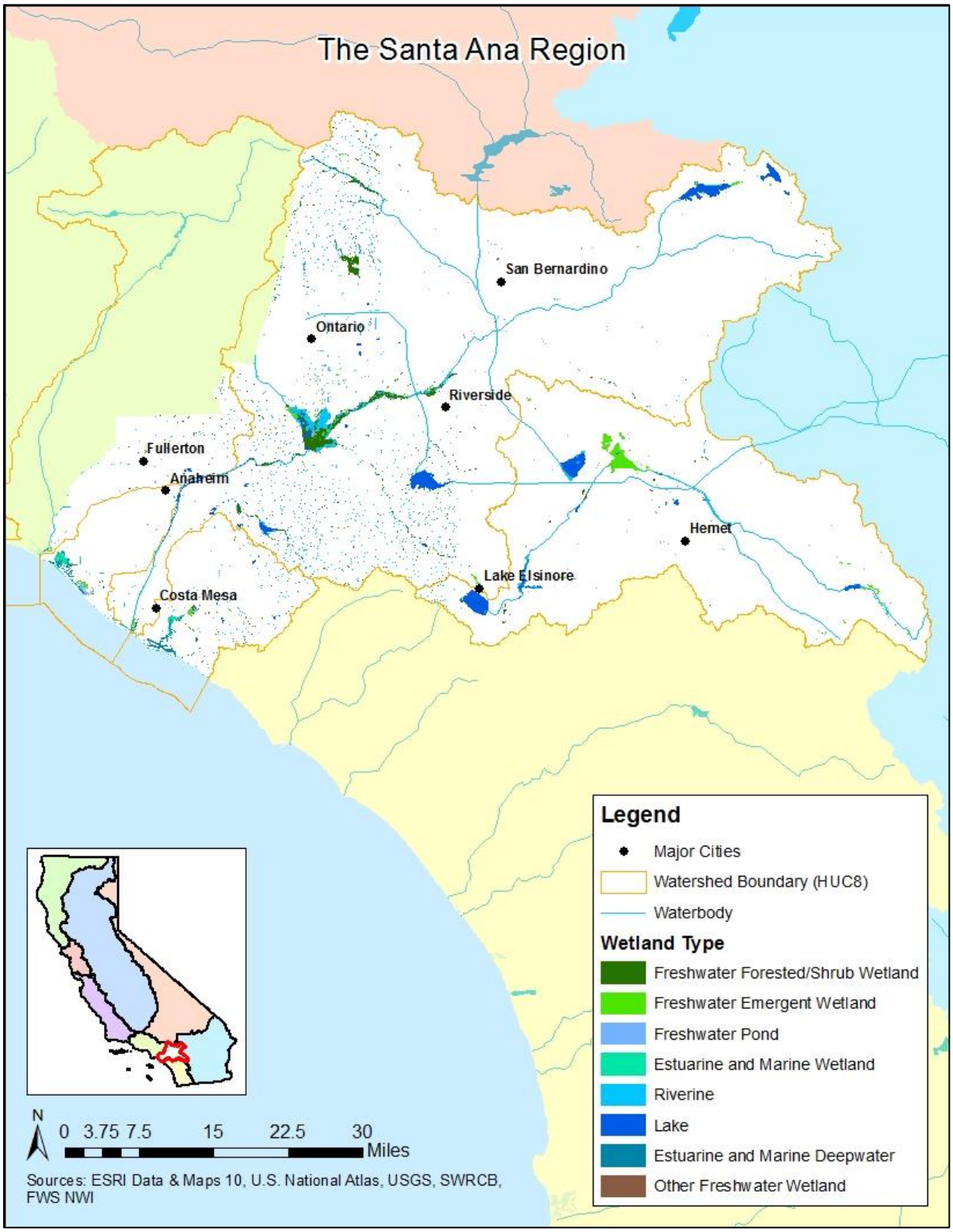


Figure 11: Santa Ana Region

San Diego Region

The San Diego Region (Figure 12) comprises all basins draining into the Pacific Ocean between the southern boundary of the Santa Ana Region and the California-Mexico boundary. The San Diego Region is located along the coast of the Pacific Ocean from the Mexican border to north of Laguna Beach. The Region is rectangular in shape and extends approximately 80 miles along the coastline and 40 miles east to the crest of the mountains. The Region includes portions of San Diego, Orange, and Riverside Counties.

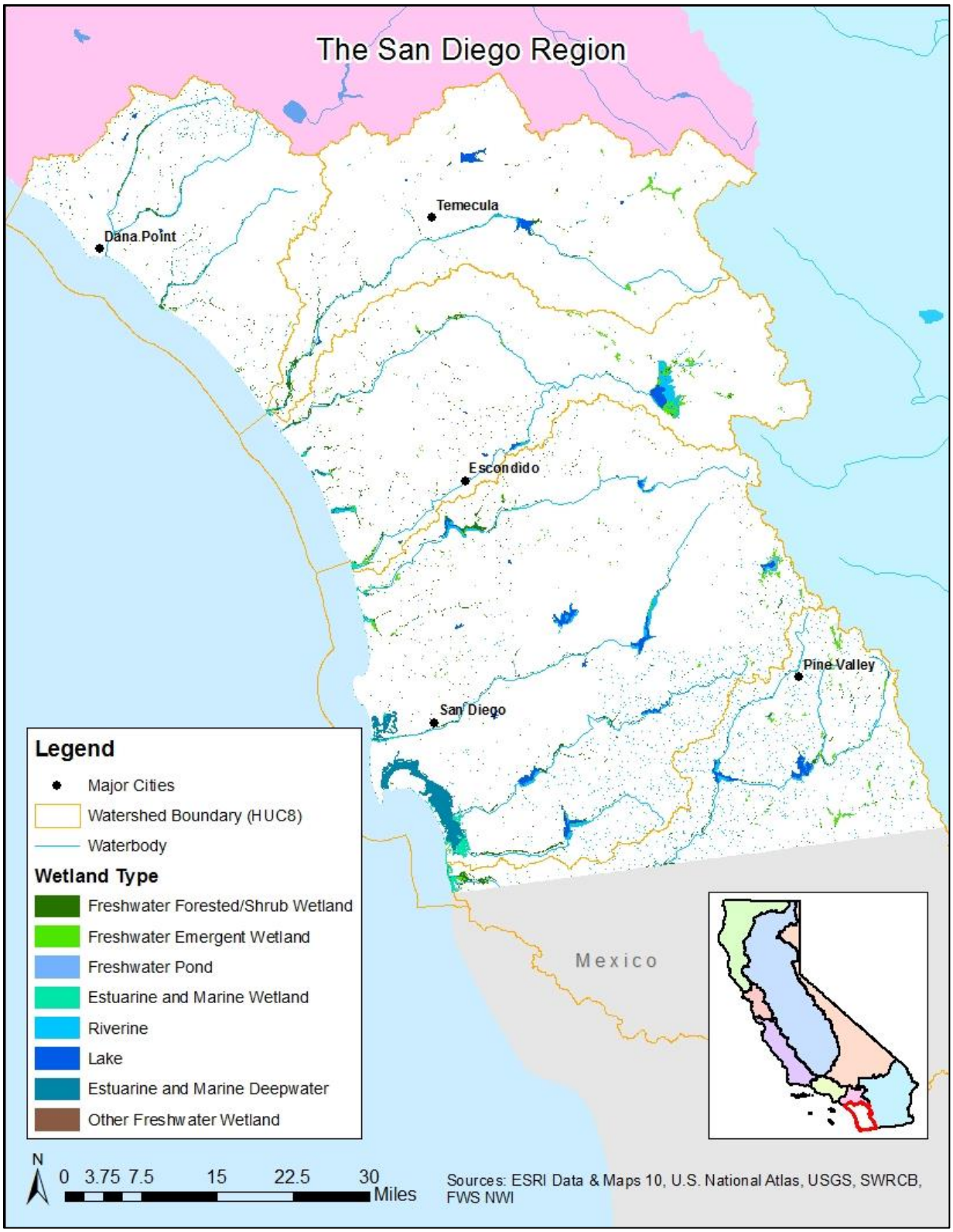


Figure 12: San Diego Region

6.10 State Hydrologic Regions

North Coast Hydrologic Region

A majority of the surface water in the North Coast hydrologic region is committed to environmental uses because of the "wild and scenic" designation of most of the region's rivers. Average annual precipitation in this hydrologic region ranges from 100 inches in the Smith River drainage to 29 inches in the Santa Rosa area.

Waterbodies that provide municipal water include the Smith, Mad, and Russian Rivers. Areas providing agricultural water are more widespread than those for domestic, municipal and industrial use, as they occur in all of the hydrologic units within the region. Many of the smaller communities and rural areas are generally supplied by small local surface water and groundwater systems. Water recreation occurs in all hydrologic units on both fresh and salt water, attracting over ten million people annually. Coastal areas receiving the greatest recreational use are the ocean beaches, the lower reaches of rivers draining to the ocean, and Humboldt and Bodega Bays. The Russian, Eel, Mad, Smith, Trinity, and Navarro Rivers and Redwood Creek provide the most freshwater recreational use.

Groundwater aquifers in the northeastern portion of the North Coast hydrologic region consist primarily of volcanic rock aquifers and some basin-fill aquifers. Coastal basin aquifers are predominantly found in the southern portion of this hydrologic region and along the northern coast. In general, though, a large percentage of this region is underlain by fractured hard rock zones that may contain localized sources of groundwater.

San Francisco Bay Hydrologic Region

Major rivers in the San Francisco Bay hydrologic region include the Napa and Petaluma, which drain to San Francisco Bay. Although this is the smallest hydrologic region in the state, it contains the second largest human population. Coastal basin aquifers are the primary type of aquifer system in this region. These aquifers can be found along the perimeter of San Francisco Bay extending southeast into the Santa Clara Valley, as well as in the Livermore Valley. The northeastern portion of this region, which includes the eastern Sacramento–San Joaquin Delta, is underlain by a portion of the Central Valley aquifer system. The remaining areas in this region are underlain by fractured hard rock zones.

Central Coast Hydrologic Region

Groundwater is the primary source of water in the Central Coast hydrologic region, accounting for approximately 75% of the annual supply. Most of the freshwater in this region is found in coastal basin aquifers, with localized sources of groundwater also occurring in fractured hard rock zones throughout the region.

South Coast Hydrologic Region

The South Coast hydrologic region is divided among 3 Regional Water Boards because it is the most populous area of the state: Los Angeles, Riverside, and San Diego. Groundwater supplies approximately 23% of the region's water in normal years and about 29% in drought years. Like the Central Coast

hydrologic region, the majority of aquifers in this region are coastal basin aquifers. In the eastern central portion of the region includes lies a small section of basin and range aquifer and the remainder of the region is comprises fractured hard rock zones.

Central Valley Hydrologic Region

The Central Valley hydrologic region is the largest in California, and encompasses the three subregions described below.

Sacramento River Hydrologic Subregion

The Sacramento River hydrologic subregion includes the entire drainage area of the Sacramento River, the largest river in California, and its tributaries. Groundwater in the northern half of this hydrologic subregion is, for the most part, contained in volcanic rock aquifers and some basin-fill aquifers. The southwestern half of this subregion is underlain by part of the Central Valley aquifer system. The remaining areas that comprise the southeastern half of the subregion and portions of the northern half of the subregion are underlain by fractured hard rock zones. Surface water quality in this hydrologic subregion is generally good. Groundwater quality in the Sacramento River subregion is also generally good, although there are localized problems.

San Joaquin River Hydrologic Subregion

A portion of the Central Valley aquifer system underlies nearly all of the eastern half of the San Joaquin River subregion, while the western half of this subregion consists of fractured hard rock zones. The groundwater quality throughout this hydrologic region is generally good and usable for most urban and agricultural uses, although localized problems occur.

Tulare Lake Hydrologic Subregion

A small area at the southern end of the Tulare Lake subregion is underlain by basin and range aquifers, while a majority of the western half is underlain by a portion of the Central Valley aquifer system. The eastern half, once again, consists of fractured hard rock zones.

Lahontan Hydrologic Region

The Lahontan hydrologic region encompasses two subregions: the North Lahontan and the South Lahontan.

The North Lahontan hydrologic subregion consists of the western edge of the Great Basin, and water in the region drains eastward toward Nevada. Groundwater in the northern half of this subregion is primarily contained in basin-fill and volcanic rock aquifers, with some fractured hard rock zones. The southern half of this region is dominated by fractured hard rock zones, but small segments of basin and range aquifers also exist in this part of the subregion.

In general, the water quality in the North Lahontan hydrologic region is good. In basins in the northern portion of the region, groundwater quality is widely variable. The groundwater quality along these basin margins tends to be of higher quality, but the potential for future groundwater pollution exists in urban

and suburban areas where single-family septic systems have been installed, especially in hard rock areas. Groundwater quality in the alpine basins ranges from good to excellent.

The South Lahontan hydrologic subregion is bounded on the west by the crest of the Sierra Nevada and on the north by the watershed divide between Mono Lake and East Walker River drainages; on the east by Nevada and the south by the crest of the San Gabriel and San Bernardino mountains and the divide between watersheds draining south toward the Colorado River and those draining northward. The subregion includes all of Inyo County and parts of Mono, San Bernardino, Kern, and Los Angeles Counties.

The South Lahontan hydrologic subregion contains numerous basin and range aquifers, separated by fractured hard rock zones. Although the quantity of surface water is limited in the South Lahontan hydrologic subregion, the quality is very good, being greatly influenced by snowmelt from the eastern Sierra Nevada. However at lower elevations, groundwater and surface water quality can be degraded, both naturally from geothermal activity, and as a result of human-induced activities. Drinking water standards are most often exceeded for TDS, fluoride, and boron content. Groundwater near the edges of valleys generally contains lower TDS content than water beneath the central part of the valleys or near dry lakes.

Colorado River Hydrologic Region

The southeast portion of California consists of the Colorado River hydrologic region. It includes a large portion of the Mojave Desert and has variable arid desert terrain that includes many bowl-shaped valleys, broad alluvial fans, sandy washes, and hills and mountains.

7. ENVIRONMENTAL SETTING

7.1 Bioregions

The California Biodiversity Council has divided California into ten bioregions: Modoc, Klamath/North Coast, Sacramento Valley, Bay Area/Delta, Sierra, San Joaquin Valley, Central Coast, Mojave Desert, South Coast, and Colorado Desert (Figure 13). The bioregions were based on the state's major physiographic provinces and were defined in order to improve communication and coordination among public and private organization (California Biodiversity Council (CBC), 2008). The bioregions contain unique mixes of biodiversity and public agency responsibilities (CBC, 2008).

Figure 13. California Bioregions (California Department of Forestry and Fire Protection (CDF), 2011)

Modoc Bioregion

The Modoc bioregion, an area of stark contrast to the rest of the state, extends across northeast corner of the state from Oregon to Nevada, and south to the southern border of Lassen County (California Environmental Resources Evaluation System (CERES), 2011a). From many vantage points, the view to the west is of forests and mountains, while the vista to the east is high desert characteristic of Nevada. Much of this sparsely populated bioregion of forests, mountains, high desert, valleys, piney woodlands, and volcanic remains in its natural state.

Location, People, Cities

Bounded by Oregon on the north and Nevada on the east, the Modoc bioregion extends westward across the Modoc Plateau, encompassing the Lassen and Modoc national forests. It includes all or part of seven counties: Modoc, Lassen, the eastern end of Shasta, Siskiyou and Tehama, and the northern edges of Butte and Plumas. Because bioregions have only fuzzy lines and can take in portions of several counties, it is difficult to estimate their populations precisely, but the rural nature of the Modoc Bioregion is reflected in the populations of the two counties totally contained within its boundaries: Modoc (10,700) and Lassen (29,800). According to 1990 census figures, the Modoc bioregion has the smallest population of all ten bioregions, with fewer than 81,000 people. The largest cities are Alturas, the Modoc County seat; Susanville, the Lassen County seat; Burney in eastern Shasta County; and Maglia in northern Butte County.

The Northern Paiute and the Paiute-Shoshone tribes are native to this bioregion. Indian reservations include Fort Bidwell, Alturas, Cedarville, Likely, and Lookout Rancherias; and Pit River, all in Modoc County. Main highways are U.S. Highway 395 and state routes 299, 139, 89, 44, and 36.

Industries

Ranching is the major agricultural industry, and timber is a significantly large employer.

Climate and Geography

The climate features hot, dry summers and cold, moist winters with snow at higher elevations. Geography is varied in the Modoc bioregion, with volcanic areas and wetlands to the west and high desert to the east. Lassen Volcanic National Park is studded with lakes and crowned by 10,457-foot Lassen Peak; Tule Lake, and Clear Lake National Wildlife Refuges. Ahjumawi Lava Springs State Park and Lava Beds National Monument are on the western side. The eastern side, which resembles its neighbor, Nevada, has desert alkali lakes, Honey Lake Valley, and Modoc National Wildlife Refuge. The last volcanic activity at Mount Lassen was in 1915.

The bioregion includes Modoc and Lassen National Forests and part of the Klamath National Forest. The largest lakes are Lake Almanor in Plumas County, Eagle Lake in Lassen County, Lower Klamath Lake in Siskiyou County, and Goose Lake in Modoc County. The Pit River flows southwest from the rugged

Warner Mountains in eastern Modoc and Lassen counties across the Modoc Plateau and into the Sacramento River.

Plants and Wildlife

Juniper and sagebrush cover much of the eastern side of the Modoc bioregion, while yellow and Jeffrey pine, white fir, mixed conifer, cedar, and aspen are common in the more mountainous and forested areas to the west. Rare plants include yellow arrowleaf, balsam root, long-haired star tulip, spiny milkwort, Ash Creek ivesia, Raven's lomatium, and woolly stenotus.

Wildlife include bald eagles, antelope, greater sandhill cranes, ospreys, Canada geese, black-crowned night herons, mule deer, muskrats, pronghorn, cinnamon teal, northern pintails, Swainson's hawks, sage grouse, rainbow trout, marmots, hummingbirds, great horned owls, black bears, coyotes, porcupine, Modoc sucker, goshawk, bank swallow, Shasta crayfish, sage grouse, and Lost River sucker.

Klamath/North Coast Bioregion

The Klamath/North Coast bioregion in the northwestern corner of the state extends roughly one-quarter of the way down the 1,100-mile coast and east across the Coastal Range and into the Cascades (CERES, 2011b). This bioregion is famous for its rocky coastline, salmon fishing, and lush mountain forests of spectacular ancient redwoods and Douglas fir. Redwood National Park and numerous state parks, rivers, wilderness areas, and four national forests are in this bioregion.

Location, Cities, People

Ten counties make up the Klamath/North Coast Bioregion: Del Norte, most of Siskiyou, Humboldt, Trinity, Mendocino, Lake, and the northwestern portions of Shasta, Tehama, Colusa, and Glenn. Its boundaries are the Oregon border on the north, and the southern borders of Lake and Mendocino counties on the south. Despite the huge area of this bioregion, its population is only about 410,000 according to 1990 census figures. The bioregion extends from the Pacific Coast eastward more than halfway across California to the Modoc Plateau and the Sacramento Valley floor. The Hoopa Valley, Yurok, Karok, Paiute-Shoshone, and Pomo-Kato Indians are native to various parts of this bioregion.

The largest cities are Redding – a Northern California crossroad on Interstate 5 – and Eureka, a Humboldt County seaport. Smaller cities include Clearlake, Ukiah, Arcata, Fort Bragg, Yreka, Mendocino, and Crescent City. Main highways are I-5, U.S. 101, and state Highways 36, 299, 96, and 3, which cross mountains and can be steep and winding.

Industries

Along the coast, redwood trees hundreds or thousands of years old are a cherished natural resource and major tourist attraction. These forests are home to the endangered marbled murrelet, a seabird that nests in old-growth, and the threatened northern spotted owl, whose decline prompted severe reductions in federal timber harvest sales to preserve its habitat. Listing of the owl under the federal Endangered Species Act (ESA) and other 1990s environmental actions caused economic impacts upon

the once-booming timber industry, such as forcing closure of many sawmills and dislocation of workers. Communities once dependent on timber activities are being forced to diversify their economies, and are encouraging the growth of tourism, improving infrastructure, and seeking ways to attract and accommodate new businesses. Cattle ranching, dairy farming, and fishing are popular traditional industries of the bioregion.

Climate and Geography

Much of the Klamath/North Coast bioregion is covered by forest: the Klamath, Shasta-Trinity, Six Rivers, and Mendocino National Forests, Jackson State Forest, and private forests, including the famous Headwaters ancient redwood forest in Humboldt County. This mountainous bioregion includes the North Coast Range and the Klamath, Siskiyou, Marble, Salmon, Trinity, and Cascade mountains. The Klamath/North Coast is the state's wettest climate, with rainfall distribution varying widely from an average annual 38 inches at Fort Bragg to 80 or more inches in the King Range National Conservation Area. The coastal climate is cool, moist, and often foggy, with rainy winters at lower elevations and snow in the higher mountains. Inland the climate is drier with low rainfall in winter and hot, dry summers.

Major rivers include the Eel, Trinity, Klamath, Russian, Smith, Salmon, Scott, Mad, and Mattole, which flows into the Pacific Ocean near seismically active Cape Mendocino. Clear Lake, Whiskeytown Lake, Clair Engle, and the western part of Shasta are the largest lakes in the bioregion.

Plants and Wildlife

Vegetation includes mixed conifer habitat of white fir, Douglas fir, ponderosa pine, Sierra lodgepole pine, incense cedar, sugar pine, red pine, Jeffrey pine, mountain hemlock, knobcone pine, western red cedar, red alder, redwood, tanoak, Pacific madrone, and chaparral. Rare plants include Sebastopol meadowfoam, Burke's goldfields, Humboldt Bay owl's clover, Calistoga ceanothus, Baker's navarretia, coast lily, swamp harebell, Tracy's sanicle, Snow Mountain willowherb, marsh checkerbloom, pale yellow stonecrop, Scott Mountain phacelia, McDonald's rock cress, Klamath Mountain buckwheat, Oregon fireweed, Adobe lily, dimorphic snapdragon, Colusa layia, Indian Valley brodiaea, and Stebbins' lewisia.

Wetlands provide places for resting, nesting, feeding and breeding for native and migrating birds and waterfowl. Wildlife in the bioregion includes deer, fox, black bear, mountain lion, California clapper rail, Aleutian Canada geese, Roosevelt elk, osprey, fisher, bank swallow, Coho salmon, king salmon, otis blue butterfly, bald eagle, Point Arena mountain beaver, Swainson's hawk, willow flycatcher, western sandpiper, and Oregon silverspot butterfly. Rare species include northern spotted owl, marbled murrelet, American peregrine falcon, Lotis blue butterfly, Trinity bristle snail, red-legged frog, Siskiyou Mountains salamander, Pacific fisher, Del Norte salamander, Karok Indian snail, wolverine, goshawk, and Chinook salmon.

Sacramento Valley Bioregion

The Sacramento Valley bioregion, a watershed of the Sierra Nevada, is rich in agriculture, but is also significant as the seat of state government (CERES, 2011c). Lying halfway between the Pacific Ocean and the Sierra Nevada, the Sacramento Valley affords convenient travel time to San Francisco and Lake Tahoe. The bioregion encompasses the northern end of the great Central Valley, stretching from Redding to the southeast corner of Sacramento County. Its southern boundary borders the northern edge of the Sacramento-San Joaquin River Delta. Sacramento, the home of the state Capitol, sits at the confluence of the Sacramento and American Rivers.

Location, Cities, People

The broad, flat valley that comprises this bioregion touches nine counties, including all of Sutter, most of Sacramento and Yolo, and portions of Butte, Colusa, Glenn, Placer, Shasta, Tehama, and Yuba counties. Sacramento, with a population of about 400,000, is the bioregion's largest city and ranks seventh in the state behind Fresno, Long Beach, San Francisco, San Jose, San Diego, and Los Angeles. Other large cities include Redding, Chico, Davis, West Sacramento, and Roseville. More than 1.5 million people inhabit this bioregion, making it the fourth most populous of the ten bioregions, based on 1990 census figures. The cultural roots of the region date from Native American inhabitants, such as the Wintun Indians, to 19th century settlers who established and worked farms and ranches.

Two of the state's major interstate highways, I-5, the state's main north-south artery, and transcontinental I-80, intersect in Sacramento. Other main highways include U.S. Highway 50, and State Highways 99, 44, 113, 70, and 20.

Industries

Agriculture and state government are important industries in the Sacramento Valley bioregion, but only three of the counties – Sutter, Yolo, and Colusa – rank among California's top 20 agricultural producers. Still, the valley is known for tomatoes, rice, and olives, among other prominent crops produced in the plentiful fields and orchards. Food canneries, high-technology, and biotechnology play a significant role. The bioregion once had a substantial military presence with three Air Force bases, but downsizing changed the picture, closing Mather, then adding McClellan to the closure list, but sparing Beale. Shipping is important in the port of West Sacramento.

Climate and Geography

The changing of the seasons is more evident in the Sacramento Valley than in the coastal regions to the west. Summer hot spells that drive daytime temperatures into triple digits are relieved by cooling “Delta breezes” that carry moist air from San Francisco Bay eastward through the Delta and into the Sacramento area. The brief, mild autumn ends when tule fog blankets the valley for much of the winter season from December into February, keeping temperatures chilled. Except during droughts, rainfall is frequent in winter, but snowfall is unusual because temperatures, particularly in the daytime, normally remain well above freezing.

The Sacramento Valley is flat for the most part, but is situated within view of mountains, which are particularly visible on clear days. To the west, the coastal range foothills loom on the horizon, while the snow-capped peaks of the Sierra Nevada can be seen to the east.

The valley's two major rivers, the Sacramento and American, carry water that originates in the Sierra Nevada south and west into the Sacramento-San Joaquin River Delta. The Delta supplies water to about two-thirds of the 32 million residents of the state. Other rivers include the Cosumnes – the largest free-flowing river in the Central Valley – the lower Feather, Bear, and Yuba Rivers.

Plants and Wildlife

Oak woodlands, riparian forests, vernal pools, freshwater marshes, and grasslands provide the major natural vegetation of the Sacramento Valley bioregion. The Sacramento Valley is the most prominent wintering site for waterfowl, attracting more than 1.5 million ducks and 750,000 geese to its seasonal marshes along the Pacific Flyway. Species include northern pintails, snow geese, tundra swans, sandhill cranes, mallards, grebes, peregrine falcons, heron, egrets, and hawks. Black-tailed deer, coyotes, river otters, muskrats, beavers, ospreys, bald eagles, salmon, steelhead, and swallowtail butterflies are just some of the wildlife that abounds in this bioregion. Species on the endangered species list include the winter-run Chinook salmon, delta smelt, giant garter snake, and the western yellow-billed cuckoo.

Bay Area/Delta Bioregion

The Bay Area/Delta bioregion is one of the most populous, encompassing the San Francisco Bay Area and the Sacramento-San Joaquin River Delta (CERES, 2011d). Environmentally, the bioregion is the focus of debate over conflicting demands for the water that flows through the Delta, supplying two-thirds of the drinking water in the state, irrigating farmland, and sustaining fish and wildlife and their habitat. Under a historic accord in 1994, competing interests initiated a process for working together to “fix” the Delta.

Location, Cities, People

The bioregion fans out from San Francisco Bay in a jagged semi-circle that takes in all or part of 12 counties, including the state's top six in family income: Marin, Contra Costa, Santa Clara, Alameda, Solano, San Mateo, as well as the counties of San Francisco, Sonoma, Napa, San Joaquin, and parts of Sacramento, and Yolo. Major cities include San Francisco, Santa Rosa, Oakland, Berkeley, Vallejo, Concord, and San Jose. Though of moderate size, the Bay-Delta bioregion is the second most populous bioregion, next to the South Coast, with 6.6 million people, based on the 1990 census.

The Bay Area/Delta bioregion extends from the Pacific Ocean to the Sacramento Valley and San Joaquin Valley bioregions to the northeast and southeast, and a short stretch of the eastern boundary joins the Sierra bioregion at Amador and Calaveras counties. The bioregion is bounded by the Klamath/North Coast bioregion on the north and the Central Coast bioregion to the south.

Major highways are Interstate 80, which concludes its transcontinental journey in San Francisco, I-280, I-580 and I-680, U.S. 101. State highways include 1, 12, 24, 29, 84, 92, 113, 116, 121, and 128.

Industries

Prominent industries of this bioregion include banking, high-technology and biotechnology, wine-making, fishing, shipping, oil refining, dairy farming, beer brewing, and fruit ranching. The Pacific coastal area of this bioregion features Point Reyes National Seashore, John Muir Woods National Monument, Golden Gate National Recreation Area, and numerous state parks and state beaches.

Climate and Geography

The temperatures in this Mediterranean climate don't vary much year-around. The coast experiences relatively cool, often foggy summers, mild falls, and chilly, rainy winters. Further inland, hot dry summers and warm autumns are followed by mild, wet winters. Snowfall is rare. The bioregion is mostly hilly with low coastal mountains and several peaks rising above 3,000 feet, including Mt. Diablo at 3,849 feet, in a state park. Coastal prairie provides grazing for wild and domestic animals, including dairy cattle.

The bioregion is named for its two major watersheds, San Francisco Bay and the Delta. Major rivers include the Russian, Gualala, Napa, Petaluma, and Alameda, and Putah Creeks. A network of reservoirs and canals comprise the State Water Project delivery system. Lake Berryessa in Napa County is the largest lake.

Plants and Wildlife

The habitats and vegetation of the Bay Area/Delta bioregion are as varied as the geography. Coastal prairie scrub, mixed hardwoods and valley oaks are found among the rolling hills and mountains that descend to the ocean. Redwoods abound in Santa Cruz County. Coastal salt marsh lies around San Francisco Bay, and freshwater marshes are found in the Delta. Eucalyptus, manzanita, northern coastal scrub, California buttercups, goldfields, and Tiberon mariposa lily also are popular in the bioregion. Rare plants include Marin western flax, Baker's manzanita, Point Reyes checkerbloom, and Sonoma sunshine. Salt and freshwater marshes provide pickleweed, great bulrush, saltbush, and cattail.

Wetlands in the Bay-Delta – brackish and freshwater – furnish resting, nesting, feeding and breeding places for birds and waterfowl along the Pacific Flyway. These marshes, rich in biodiversity, are popular and necessary wintering spots for migrating birds.

Birds include canvasback, western grebe, black-crowned night heron, great egret, snowy egret, California brown pelican, white pelican, gull, acorn woodpecker, golden eagle, western bluebird, Caspian tern, American avocet, and cedar waxwing. Marine life includes Chinook salmon, harbor seal, sea lion, leopard shark, and bat ray. Other wildlife includes grey fox, mule deer, bobcat, raccoon, Pacific tree frog, and the swallowtail and painted lady butterfly.

Endangered species include the California least tern, California black rail and clapper rail, Smith's blue butterfly, salt marsh harvest mouse, California freshwater shrimp, northwestern pond turtle, and tidewater goby.

Sierra Bioregion

The Sierra bioregion is a vast and rugged mountainous area extending some 380 miles along eastern side of the state, and largely contiguous with Nevada (CERES, 2011e). Named for the Sierra Nevada mountain range it encompasses, the Sierra bioregion includes magnificent forests, lakes, and rivers that generate much of the state's water supply. It shares Lake Tahoe with Nevada and features eight national forests, three national parks – Yosemite, Kings Canyon and Sequoia – numerous state parks, historical sites, wilderness, special recreation and national scenic areas, and mountain peaks, including 14,495-foot Mt. Whitney.

Location, Cities, People

Eighteen counties, or their eastern portions, comprise the Sierra bioregion: Alpine, Amador, Butte, Calaveras, El Dorado, Fresno, Inyo, Kern, Madera, Mariposa, Mono, Nevada, Placer, Plumas, Sierra, Tulare, Tuolumne, and Yuba. The bioregion extends from the northern edge of the Plumas National Forest south to Tejon Pass in the Tehachapi Mountains about 30 miles southeast of Bakersfield. The northern half of the Sierra bioregion is bordered by the Nevada state line to the east and the Sacramento Valley floor to the west. The southern half of the Sierra extends westward from the Nevada state line and the western edge of the Bureau of Land Management's California Desert Conservation Area to the San Joaquin Valley floor. The historic Mother Lode region of 19th century Gold Rush fame is in the Sierra bioregion.

Scattered throughout the mountains are small cities such as Truckee, Placerville, Quincy, Auburn, South Lake Tahoe, and Bishop. The Sierra Nevada Ecosystem Project fixed the Sierra population at 650,000, which is consistent with 1990 census figures.

Major routes for vehicular traffic are Interstate 80, U.S. Highways 50 and 395, and state highways 4, 49, 70, 88, 89, 108, 120, and 178. Some mountain roads at higher elevations are closed in winter because of snow, and highways frequently require chains or snow tires for travel.

Industries

High tech has emerged as a significant industry in the Sierra, introducing satellite, on-line, and computer software companies and stimulating entrepreneurial small businesses. This growing segment of the economy joins staples such as hydropower, tourism and recreation. Other industries include logging, cattle ranching, and in the northern Sierra foothills, apple orchards and wineries.

Climate and Geography

The climate varies with the elevation, offering cold snowy winters and cool summers at higher elevations and rainy winters and mild summers in the foothills. Summers are dry. Snowy winters in the northern Sierra are crucial to the water supply in the state, which depends heavily upon spring snowmelt to feed the reservoirs of the State Water Project and a portion of the federal Central Valley Project. The projects supply about two-thirds of water for drinking, irrigation, and industrial use in the

state. Snowfall also is welcomed by the ski industry and a myriad of other businesses that serve and supply skiers. Mild dry mountain summers accommodate outdoor sports and activities, but when high pressure areas push temperatures upward and gusty winds blow, California is vulnerable to wildfires that consume thousands of acres of brush and timber every year.

National forests of the Sierra bioregion are the Plumas, Tahoe, Sierra, Eldorado, Stanislaus, Sequoia, Inyo, and Toiyabe. Major rivers include the American, Feather, Yuba, Cosumnes, Tuolumne, Merced, San Joaquin, Kern, Owens, Kings, Carson, Truckee, Walker, and Stanislaus. Mono Lake east of Yosemite is famous for its peculiar tufa formations rising from the lake bed.

Plants and Wildlife

The Sierra bioregion is rich in biodiversity, containing over half the plant species found in California and more than 400 of the state's terrestrial wildlife species, or about two-thirds of the birds and mammals and half the reptiles and amphibians. The variety of habitat types include annual grassland, blue oak savannah, chaparral, ponderosa pine, black oak woodland, mixed conifer, red fir, riparian, alpine meadow, Jeffrey pine, sagebrush, and bitter brush.

Animals that inhabit the Sierra bioregion include lodgepole chipmunk, mountain beaver, California mountain king snake, black bear, wolverine, California big horn sheep, Pacific fisher, mule deer, and mountain lion. The California Golden Trout – the state fish – is native to the Southern Sierra. Birds include the northern goshawk, mountain chickadee, pine grosbeak, California spotted owl, mountain quail, willow flycatcher, bald eagle, and great grey owl.

San Joaquin Valley Bioregion

The San Joaquin Valley bioregion in the heart of California is the state's top agricultural producing region (CERES, 2011f). The bioregion is bordered on the west by the coastal mountain ranges. Its eastern boundary joins the southern two-thirds of the Sierra bioregion, which features Yosemite, Kings Canyon, and Sequoia National Parks.

Location, Cities, People

Eight counties comprise the San Joaquin Valley bioregion, including all of Kings County, most of Fresno, Kern, Merced, and Stanislaus counties, and portions of Madera, San Luis Obispo, and Tulare counties. This growing bioregion, the third most populous out of ten, has an estimated 2 million people, according to 1990 census data. The largest cities are Fresno, Bakersfield, Modesto, and Stockton. Some of poorest cities in the state are in Fresno, Kern, and Tulare counties. At its northern end, the San Joaquin Valley bioregion borders the southern end of the Sacramento Valley bioregion. To the west, south, and east, the bioregion extends to the edges of the valley floor. Native people of the bioregion include the Mono and Yokut Indians. Native lands include the Tule River Indian Reservation in Tulare County, Cold Springs Rancheria, and Table Mountain and Big Sandy Reservations in Fresno County, and Santa Rosa Rancheria in Kings County.

Interstate 5 and State Highway 99 are the major north-south roads that run the entire length of the bioregion. Other main routes include State Highways 33, 41, 43, 65, 132, 140, 178, 180, and 198.

Industries

The San Joaquin Valley is the leading agricultural producing bioregion in the state, and five of its counties – Fresno, Kern, Tulare, Merced, and Stanislaus – rank among the top ten counties in farm production value. Oil and gas also are important industries in the San Joaquin bioregion. The deepest wells and about half of the largest oil fields are found in Kern County, as is the Elkhorn Hills Naval Petroleum Reserve. Lemoore Naval Air Station west of Visalia also is in this bioregion.

Climate and Geography

Well-suited for farming, the bioregion is hot and dry in summer with long, sunny days. Winters are moist and often blanketed with heavy fog. The broad, flat valley is ringed by the Diablo and Coast Ranges on the west and the Sierra Nevada foothills on the east. Habitat includes vernal pools, valley sink scrub and saltbush, freshwater marsh, grasslands, arid plains, orchards, and oak savannah. The growth of agriculture in the Central Valley has converted much of the historic native grassland, woodland, and wetland to farmland.

The major river is the San Joaquin, with tributaries of the lower Stanislaus, Tuolumne, Merced, and Fresno rivers. The California Aqueduct extends the entire length of the bioregion. The southern portion of the bioregion includes the Kings, Kaweah, and Kern rivers, which drain into closed interior basins. No significant rivers or creeks drain into the valley from the Coast Range.

Plants and Wildlife

Historically, millions of acres of wetlands flourished in the bioregion, but stream diversions for irrigation dried all but about 5 percent. Precious remnants of this vanishing habitat are protected in the San Joaquin Valley bioregion in publicly owned parks, reserves, and wildlife areas. Seasonal wetlands are found at the Kern National Wildlife Refuge west of Delano, owned by the U.S. Fish and Wildlife Service. It attracts a variety of ducks, shorebirds, and song birds, as well as peregrine falcons.

The Tule Elk State Reserve west of Bakersfield, owned by the state Department of Parks and Recreation, features the habitat of the tule elk, which is natural grassland with ponds and marshes. The reserve sustains four endangered species: the San Joaquin kit fox, blunt-nosed leopard lizard, San Joaquin antelope squirrel, and Tipton kangaroo rat; the threatened plant Hoover's woolystar; and other rare species, such as western pond turtles, tricolored blackbird, and northern harrier. Endangered species of the bioregion also include the California tiger salamander, Swainson's hawk, and giant and Fresno kangaroo rat. Other rare species include the western yellow-billed cuckoo and valley elderberry longhorn beetle.

About one-fifth of the state's remaining cottonwood and willow riparian forests are found along the Kern River in the South Fork Wildlife Area. Great blue herons, beavers, coyotes, black bears, mountain

lions, red-shouldered hawks, and mule deer can be seen in the wildlife area. Other wildlife viewing sites are Millerton Lake State Recreation Area west of Madera, Little Panoche Wildlife Area near Los Banos, and the Valley Grasslands of Merced County, which attract 500,000 to 1 million birds each winter to privately owned lands and lands owned by the CDFW and Parks and Recreation and the U.S. Fish and Wildlife Service. The San Luis Dam and Reservoir area, jointly operated by the state Department of Water Resources and U.S. Bureau of Reclamation, draws wintering bald eagles, abundant ducks, gopher snakes, San Joaquin kit foxes, and black-tailed deer.

Rare plants in the bioregion include Mason's lilaeopsis, San Joaquin woollythreads, and California hibiscus.

Central Coast Bioregion

The Central Coast bioregion features coastal scenery, with a mild, seasonally moist, and sometimes foggy climate that favors rich farmland and vineyards (CERES, 1996). This highly agricultural region is famous for artichokes, garlic, and an array of fruits and vegetables. Other industries include wine-making, dairy, and cattle ranching. The coast supports a brisk fishing industry, and oil production along the southern end of the bioregion.

Industries

The bioregion extends some 300 miles from just north of Santa Cruz to just south of Santa Barbara, and inland to the floor of the San Joaquin Valley. It encompasses the counties of Santa Cruz, Monterey, San Benito, Santa Barbara, and portions of Los Angeles, San Luis Obispo, Fresno, Merced, Stanislaus, and Ventura. The region includes military installations Fort Ord, Camp Roberts, and Vandenburg Air Force Base. The geography offers coastal mountain ranges including the Santa Lucia and Santa Ynez, and coastal sand dunes. Vegetation includes chaparral, mixed hardwood and redwood forests in the bioregion's northern coastal area, and oak woodlands. The Los Padres National Forest covers much of the southern portion of the bioregion. The Salinas and Cuyama rivers feed the bioregion's two major watersheds.

Mojave Desert Bioregion

The Mojave bioregion is one of the largest bioregions in the state, and a desert showcase (CERES, 2011g). The eastern boundary is contiguous with the borders of Nevada and Arizona. To the north and west, the Mojave borders the Sierra bioregion, and to the south, it is bounded by the South Coast and Colorado Desert bioregions.

Location, Cities, People

Seven counties make up the Mojave bioregion: nearly all of San Bernardino, most of Inyo, the southeastern tips of Mono and Tulare, the eastern end of Kern, northeastern desert area of Los Angeles, and a piece of northern-central Riverside County. The largest cities are Palmdale – one of the fastest-growing communities in the state – Victorville, Hesperia, Ridgecrest, and Barstow. The Mojave bioregion, historically a sparsely populated expanse of desert, had nearly 612,000 people as of the 1990

census, but is growing rapidly, as urban congestion and housing costs push people farther into the open areas.

Native Americans lands in the Mojave bioregion include the Chemehuevi Indian Reservation on the Colorado River, Twentynine Palms Indian Reservation, Fort Mojave Indian Reservation, and Fort Mojave Trust Lands, which both straddle the California-Nevada border.

Industries

The Mojave bioregion is the home of three national parks under the National Park Service: Death Valley, East Mojave, and Joshua Tree. The state Department of Parks and Recreation manages the Providence Mountains State Recreational Area near Goffs in eastern San Bernardino County, and the U.S. Fish and Wildlife Service operates Havasu National Wildlife Refuge on the Colorado River near Lake Havasu.

Military installations include Edwards Air Force Base in Kern, Los Angeles, and San Bernardino counties; Twentynine Palms Marine Corps Air Ground Combat Center, Fort Irwin Military Reservation, Inyokern Naval Ordnance Test Station, and China Lake U.S. Naval Ordnance Test Station in San Bernardino, Inyo, and the eastern end of Kern counties. Much of the desert is under the U.S. Bureau of Land Management, which manages the Desert Tortoise Natural Area northeast of Palmdale, and Harper Lake near Barstow. The Bureau of Land Management has created a multi-agency, multi-species plan for the desert that designates certain areas for habitat, multiple uses, and development. It is designed to conserve habitat, foster economic development, and streamline the permitting process for development.

Major highways in the bioregion are Interstates 15, 40, U.S. Highway 395, and State Highways 18, 58, 62, and 127, and 247.

Mining, including lucrative gold mining, is a major industry in the Mojave bioregion. Off-road vehicle riding is a popular sport in the desert, which offers many trails across the plains and through the scrub. Ranching and livestock grazing are significant economic interests in this bioregion.

Climate and Geography

The Mojave bioregion is the western extension of a vast desert that covers Southern Nevada, the southwestern tip of Utah, and 25 million acres of Southern California, which is one quarter of the state. The climate is hot and dry in summer. Winters are cool to cold, depending on the elevation, with occasional rainstorms that can quickly turn a gulch or dry lake into a flash flood zone.

The landscape is mostly moderately high plateau with elevations averaging 2,000 to 3,000 feet and isolated peaks that exceed 6,000 and 7,000 feet. Though appearing barren and remote, the desert teems with biodiversity, and more than 90 percent is within three miles of a paved road or off-road vehicle track.

Palm oases provide water for wildlife, as do many streams and springs. In prehistoric times, the bioregion contained great desert lakes, which have long since evaporated and seeped underground. This

bioregion has the lowest elevation in North America, 282 feet below sea level in Death Valley National Park. The Mojave, Amargosa, and Colorado Rivers are the largest rivers in this mostly arid bioregion.

Plants and Wildlife

Common habitats of the Mojave bioregion are: desert wash, Mojave creosote bush, scattered desert saltbush, Joshua tree scrub, alkali scrub, palm oasis, juniper-pinyon woodland, and some hardwood and conifer forests at higher elevations. Cottonwood willow riparian forest is rare habitat in this bioregion, as is alkali marsh and open sandy dunes.

Rare animals include the Mohave ground squirrel, prairie falcon, Le Conte's thrasher, Nelson's bighorn sheep, gray vireo, desert tortoise, pale big-eared bat, Amargosa vole, and Mohave tui chub, an olive-brown and silver fish, and the cottontail marsh pupfish, found only in Death Valley National Park. Parks and recreation areas that provide water are the home of snowy plovers, least sandpipers, killdeer, white pelicans, teal, and thousands of migratory wading shore birds, as well as eagles, harriers, falcons, owls, coyotes, badgers, great blue herons, least Bell's vireos, red-tailed hawks, and Canada geese.

Rare plants include white bear poppy, Barstow woolly sunflower, alkali mariposa lily, Red Rock poppy, Mojave monkeyflower, and Stephen's beardtongue.

Colorado Desert Bioregion

The Colorado Desert bioregion in the southeastern corner of California extends from the Mexican border north to San Bernardino County and the southern edge of the Joshua Tree National Park, east to the Colorado River and Arizona, and west into Riverside and San Diego counties (CERES, 2011h). This agriculturally rich bioregion is semi-arid, but heavily irrigated.

Location, Cities, People

With a population of about 375,000, according to 1990 census figures, the Colorado Desert is the second least populous of the ten bioregions. Only the Modoc bioregion has fewer people. The bioregion encompasses all of Imperial County, the southeastern portion of Riverside County, the eastern end of San Bernardino County, and the eastern portion of San Diego County. Its most prominent cities are Palm Springs, Rancho Mirage, El Centro, and the smaller, but landmark communities of Blythe, Coachella, and Calexico. The bioregion is home to the Fort Yuma Indian Reservation in Imperial County and Arizona, the Colorado River Indian Reservation in Riverside County, and the Campo and Manzanita Indian Reservations in San Diego County. Imperial County has the state's lowest median family income.

Major highways are Interstate 10 in Riverside County, Interstate 8 in Imperial and San Diego counties, and State Highways 111 and 115 in Imperial County.

Industries

Picacho State Recreation Area on the Arizona border, operated by the state Department of Parks and Recreation, offers boat rides on the Colorado River from which can be seen migratory cormorants,

mergansers, white pelicans, and wintering bald eagles. Trails into the rugged backcountry lead to the habitat of desert bighorn sheep, feral burros, golden eagles, and nesting prairie falcons.

The Salton Sea National Wildlife Refuge features open water, salt marshes, freshwater ponds, and desert scrub which attract nearly 400 bird species, including great roadrunners, Gambel's quail, Albert's towhees, endangered Yuma clapper rails, egrets, plovers, northern pintails, Canada geese, snow geese, rough-legged hawks, peregrine falcon, terns, yellow-headed blackbirds, hooded orioles, and white-faced ibises. The refuge is operated by the CDFW and Parks and Recreation, and the U.S. Fish and Wildlife Service.

Dos Palmas Preserve, near Indio, owned by the U.S. Bureau of Land Management, offers a lush desert oasis with a restored wetlands that accommodates endangered desert pupfish. The preserve attracts an array of wildlife, such as hooded orioles, warblers, snowy egrets, ospreys, American avocets, and horned lizards. The western fringe of the Imperial National Wildlife Refuge, located mostly in Arizona, is also in this bioregion.

Imperial County is one of the top-ranking agricultural counties in the state, a product from which is cotton. Military installations include the Chocolate Mountains Naval Aerial Gunnery Range and the Naval Desert Test Range.

Climate and Geography

The Colorado Desert is the western extension of the Sonoran desert that covers southern Arizona and northwestern Mexico. It is a desert of much lower elevation than the Mojave Desert to the north, and much of the land lies below 1,000 feet elevation. Mountain peaks rarely exceed 3,000 feet. Common habitat includes sandy desert, scrub, palm oasis, and desert wash. Summers are hot and dry, and winters are cool and moist.

The Colorado River flows along the entire eastern boundary of the Colorado Desert bioregion on its way to Yuma, Ariz., where the two states and Mexico come together. The only other river of significant size in this bioregion is the polluted New River, which flows from Mexico into the Salton Sea, the region's largest body of water, on the border of Imperial and Riverside counties. The Salton Sea was created in 1905 when the Colorado River broke through an irrigation project and flooded a saline lake bed, creating an inland sea, which now lies about 235 feet below sea level and is some 35 miles long and 15 miles wide.

Anza Borrego Desert State Park, located mostly in eastern San Diego County, but jutting into Imperial County, is the bioregion's largest recreation area, covering 600,000 acres. It offers more than 225 bird species and dozens of mammals, amphibians, and reptiles. Bighorn sheep can be seen there, as well as thrashers and owls.

Plants and Wildlife

Other species in the Colorado Desert are Yuma antelope ground squirrels, white-winged doves, muskrats, southern mule deer, coyotes, bobcats, and raccoons. Rare animals include desert pupfish, flat-tailed horned lizard, prairie falcon, Andrew's dune scarab beetle, Coachella Valley fringe-toed lizard, Le Conte's thrasher, black-tailed gnatcatcher, and California leaf-nosed bat. Rare plants include Orcutt's woody aster, Orocopia sage, foxtail cactus, Coachella Valley milk vetch, and crown of thorns.

South Coast Bioregion

The South Coast bioregion is an area of starkly contrasting landscapes ranging from rugged coastal mountains, world-famous beaches, rustic canyons, rolling hills, and densely populated cities (CERES, 2011i). The bioregion extends from the southern half of Ventura County to the Mexican Border and east to the edge of the Mojave Desert. Two of California's largest metropolitan areas, Los Angeles and San Diego, are in this bioregion.

Location, Cities, People

Bounded on the north by the southern end of the Los Padres National Forest, the bioregion extends some 200 miles south to Mexico, east to the Mojave Desert and west to the Pacific Ocean. The bioregion encompasses all or part of six counties: the coastal half of Ventura County, all of Orange County, most of Los Angeles County, the southwestern edge of San Bernardino County, the western end of Riverside County, and the western two-thirds of San Diego County. Major cities include Los Angeles, San Diego, Long Beach, Santa Ana, Anaheim, Riverside, and San Bernardino. The South Coast, home to two of the state's largest cities, is the most populous bioregion with more than 16.1 million people, according to 1990 census figures.

Metropolitan Los Angeles, a major transportation hub, is criss-crossed by a network of freeways that have names as well as numbers. For example, Interstate 5, the main north-south highway in the state, is known in different segments as the Golden State Freeway, the Santa Ana Freeway, and the San Diego Freeway. Other major routes are Interstates, 8, 10, 15, 110, 210, 405, 605, and 805, U.S. 101, and State Highways 1 (the Pacific Coast Highway), 57, 60, 74, 76, 78, 91, 118, and 126.

As in much of California, the people of the South Coast bioregion reflect the state's cultural history. The Native American population includes many bands of Mission Indians, and the Spanish and Mexican heritage is evident in architecture, geographic names, and a large Spanish-speaking population. Rapid growth, employment opportunity, and a mild, mostly dry climate has attracted immigrants from all over the world, particularly in metropolitan Los Angeles.

Industries

Major industries include oil, agriculture, fishing, shipping, movies and television, banking and finance, computers, and aerospace, which has declined with the ending of the Cold War. Military installations include Camp Pendleton Marine Corps Base, El Toro Marine Corps Air Station, March Air Force Base,

Miramar Naval Air Station, North Island Naval Air Station, and Point Mugu Naval Pacific Missile Test Center.

Climate and Geography

The year-round mild climate and varied geographical features of the South Coast contribute to its great popularity. Hot dry summers with predictable wildfires are followed by wet winters with storms that can trigger mudslides on fire-denuded slopes. Smog remains a serious problem in the South Coast bioregion, particularly the Los Angeles basin, but air quality regulations have helped to control it.

The South Coast bioregion is a study in contrasts, ocean and desert, flatlands and mountains, including 11,500-foot San Gorgonio Peak in Riverside County. Major rivers and their watersheds are: the Santa Clara, Los Angeles, Santa Ana, San Gabriel, San Luis Rey, San Jacinto, Santa Margarita, and San Diego. Publicly owned or managed lands include four national forests: the Angeles, Los Padres, Cleveland, and San Bernardino; numerous parks, state beaches, historic parks; and federal wilderness, recreation and wildlife areas, including Malibu Creek and Point Mugu State Parks, Bolsa Chica Ecological Reserve, Torrey Pines State Reserve, and Sweetwater and Tijuana National Wildlife Refuges. In San Diego, Orange and Riverside counties, the state's NCCP pilot program involving local, state, and federal partners is helping to protect the coastal sage scrub habitat of the threatened California gnatcatcher. In the Santa Monica Mountains, the National Park Service, Santa Monica Mountains Conservancy, and state Department of Parks and Recreation are helping to preserve spectacular habitat. In Ventura County, endangered California condors are protected at the Sespe Condor Sanctuary.

Plants and Wildlife

Tremendous urbanization in the South Coast bioregion has brought about the most intense effects on natural resources of any bioregion, resulting in alteration and destruction of habitat and proliferation of exotic or non-native species. In fact, the popular palm tree is not native to the Golden State. Habitat varies widely, from chaparral, juniper-pinyon woodland, and grasslands at lower elevations to mixed hardwood forest, southern oak, southern Jeffrey pine and southern yellow pine at higher levels. Along the coast, where real estate is especially prized, salt marshes and lagoons no longer are common habitat. However, efforts are underway from Ventura County to the Mexican border to preserve and restore coastal wetlands.

The bioregion is home to mountain lions, coyotes, badgers, grey foxes, kit foxes, black bears, raccoons, mule deer, hawks, herons, golden eagles, ospreys, peregrine falcons, desert iguanas, dolphins, whales, endangered brown pelicans, and California sea lions. Rare animals include the Stephen's kangaroo rat, monarch butterfly, San Diego horned lizard, Peninsula desert bighorn sheep, orange-throated whiptail, California least tern, Belding's savannah sparrow, least Bell's vireo, Santa Ana sucker, arroyo southwestern toad and Tehachapi pocket mouse.

Rare plants include San Diego barrel cactus, Conejo buckwheat, Plummer's mariposa lily, mountain springs bush lupine, Otay tarplant, Laguna Mountains jewelflower, San Jacinto prickly phlox, and Mt. Gleason Indian paintbrush.

7.2 California Ecosystems

The USEPA has developed an ecoregion classification system derived and refined from Omernik (1987). The ecoregions are based on the premise that ecological regions can be identified through the analysis of the patterns and the composition of biotic and abiotic phenomena that affect or reflect differences in ecosystem quality and integrity.[58] Biotic and abiotic phenomena include geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology. There are four different levels of ecoregions, with level I being the coarsest and level IV being the most detailed. In California, there are twelve level III ecoregions (Figure 14). The twelve level III ecoregions of California are described below.[59]

[58] http://www.epa.gov/wed/pages/ecoregions.htm (accessed 1/30/2014)
[59] Level III ecoregion descriptions verbatim from Word document located at http://www.epa.gov/wed/pages/ecoregions/na_eco.htm#Downloads (accessed 1/30/2014).

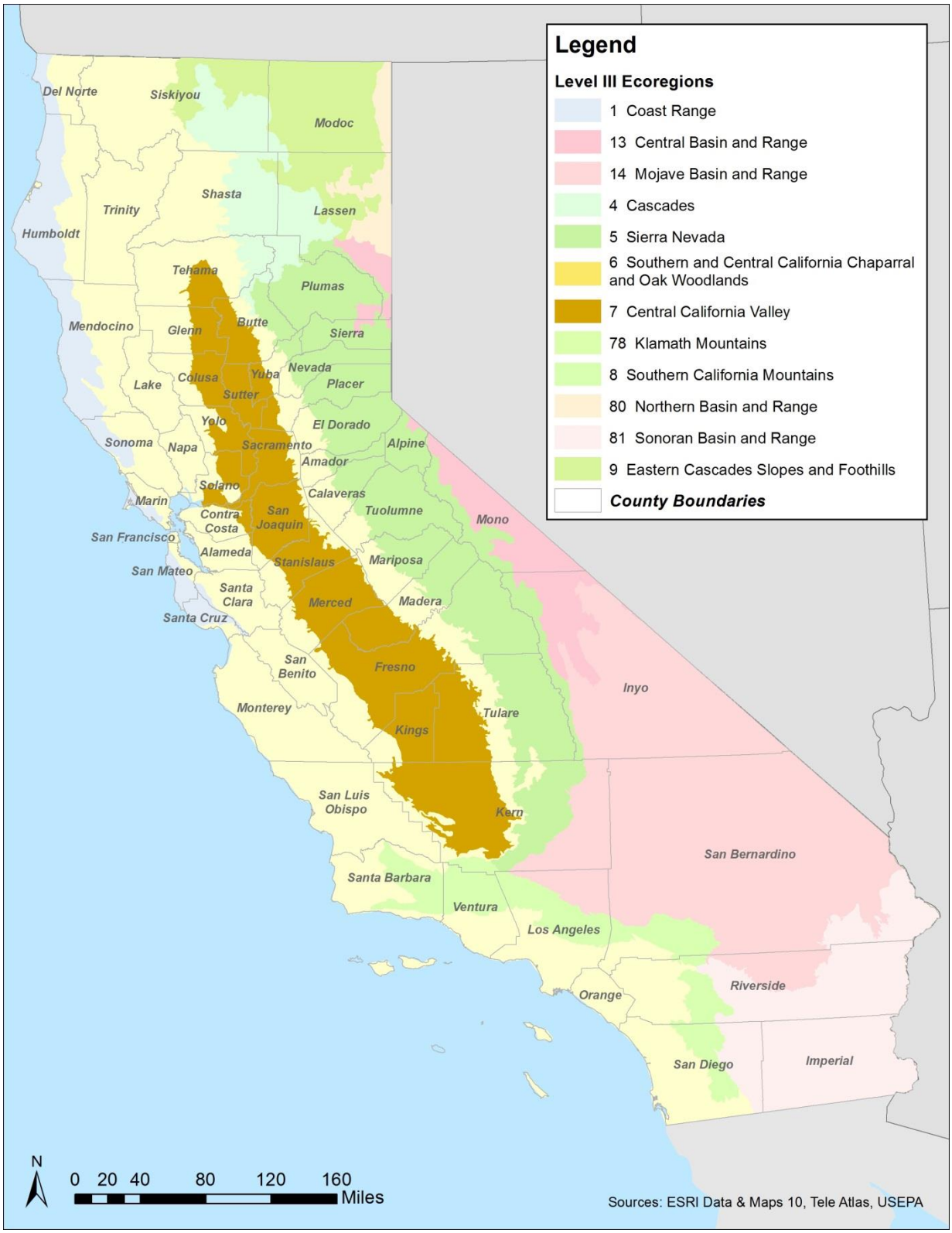


Figure 14: Level III Ecoregions of California (USEPA, 2013a)

Coast Range

The low mountains of the Coast Range of western Washington, western Oregon, and northwestern California are covered by highly productive, rain-drenched coniferous forests. Sitka spruce forests originally dominated the fog-shrouded coast, while a mosaic of western red cedar, western hemlock, and seral Douglas-fir blanketed inland areas. Today, Douglas-fir plantations are prevalent on the intensively logged and managed landscape. In California, redwood forests are a dominant component in much of the region. In Oregon and Washington, soils are typically Inceptisols and Andisols, while Alfisols are common in the California portion. Landslides and debris slides are common, and lithology influences land management strategies. In Oregon and Washington, slopes underlain by sedimentary rock are more susceptible to failure following clear-cutting and road building than those underlain by volcanic rocks. Coastal headlands, high and low marine terraces, sand dunes, and beaches also characterize the region.

Cascades

This mountainous ecoregion stretches from the central portion of western Washington, through the spine of Oregon, and includes a disjunct area in northern California. It is underlain by Cenozoic volcanics and much of the region has been affected by alpine glaciation. In Oregon and Washington, the western Cascades are older, lower, and dissected by numerous, steep-sided stream valleys. A high plateau occurs to the east, with both active and dormant volcanoes. Some peaks reach over 14,000 feet. Soils are mostly of cryic and frigid temperature regimes, with some mesic soils at low elevations and in the south. Andisols and Inceptisols are common. The Cascades have a moist, temperate climate that supports an extensive and highly productive coniferous forest that is intensively managed for logging. At lower elevations in the north, Douglas-fir, western hemlock, western red cedar, big leaf maple, and red alder are typical. At higher elevations, Pacific silver fir, mountain hemlock, subalpine fir, noble fir, and lodgepole pine occur. In southern Oregon and California, more incense cedar, white fir, and Shasta red fir occur along with other Sierran species. Subalpine meadows and rocky alpine zones occur at highest elevations.

Sierra Nevada

The Sierra Nevada is a mountainous, deeply dissected, and westerly tilting fault block. The central and southern part of the region is largely composed of granitic rocks that are lithologically distinct from the mixed geology of the Klamath Mountains (78) and the volcanic rocks of the Cascades (4). In the northern Sierra Nevada, however, the lithology has some similarities to the Klamath Mountains. A high fault scarp divides the Sierra Nevada from the Northern Basin and Range (80) and Central Basin and Range (13) to the east. Near this eastern fault scarp, the Sierra Nevada reaches its highest elevations. Here, moraines, cirques, and small lakes are common and are products of Pleistocene alpine glaciation. Large areas are above timberline, including Mt. Whitney in California, the highest point in the conterminous United States at nearly 14,500 feet. The Sierra Nevada casts a rain shadow over Ecoregions 13 and 80 to the east. The ecoregion slopes more gently toward the Central California Valley (7) to the west. The vegetation grades from mostly ponderosa pine and Douglas-fir at the lower elevations on the west side,

pines and Sierra juniper on the east side, to fir and other conifers at the higher elevations. Alpine conditions exist at the highest elevations. Large areas are publicly-owned federal land, including several national parks.

Central California Foothills and Coastal Mountains

The primary distinguishing characteristic of this ecoregion is its Mediterranean climate of hot dry summers and cool moist winters, and associated vegetative cover comprising mainly chaparral and oak woodlands; grasslands occur in some lower elevations and patches of pine are found at higher elevations. Surrounding the lower and flatter Central California Valley (7), most of the region consists of open low mountains or foothills, but there are some areas of irregular plains and some narrow valleys. Large areas are in ranch lands and grazed by domestic livestock. Relatively little land has been cultivated, although some valleys are major agricultural centers such as the Salinas or the wine vineyard center of Napa and Sonoma.

Central California Valley

Flat, intensively farmed plains with long, hot dry summers and mild winters distinguish the Central California Valley from its neighboring ecoregions that are either hilly or mountainous, forest or shrub covered, and generally nonagricultural. It includes the flat valley basins of deep sediments adjacent to the Sacramento and San Joaquin rivers, as well as the fans and terraces around the edge of the valley. The two major rivers flow from opposite ends of the Central Valley, flowing into the Delta and into San Pablo Bay. It once contained extensive prairies, oak savannas, desert grasslands in the south, riparian woodlands, freshwater marshes, and vernal pools. More than half of the region is now in cropland, about three fourths of which is irrigated. Environmental concerns in the region include salinity due to evaporation of irrigation water, groundwater contamination from heavy use of agricultural chemicals, wildlife habitat loss, and urban sprawl.

Southern California Mountains

Similar to other ecoregions in central and southern California, the Southern California Mountains have a Mediterranean climate of hot dry summers and moist cool winters. Although Mediterranean types of vegetation such as chaparral and oak woodlands predominate in this region, the elevations are considerably higher, the summers are slightly cooler, and precipitation amounts are greater than in adjacent ecoregions, resulting in denser vegetation and some large areas of coniferous woodlands. In parts of the Transverse Range, a general slope effect causes distinct ecological differences. The south-facing slopes typically have higher precipitation (30-40 inches) compared to many of the north slopes of the range (15-20 inches), but high evaporation rates on the south contribute to a cover of chaparral. On the north side of parts of the ecoregion, lower evaporation, lower annual temperatures, and slower snow melt allows for a coniferous forest that blends into desert montane habitats as it approaches the Mojave Desert ecoregion boundary. Woodland species such as Jeffrey, Coulter, and Ponderosa pines occur, along with sugar pine, white fir, bigcone Douglas-fir, and, at highest elevations, some lodgepole and limber pines. Severe erosion problems are common where the vegetation cover has been destroyed by fire or overgrazing. Large portions of the region are National Forest public land.

Eastern Cascade Slopes and Foothills

The Eastern Cascade Slopes and Foothills ecoregion is in the rainshadow of the Cascade Range (4). It has a more continental climate than ecoregions to the west, with greater temperature extremes and less precipitation. Open forests of ponderosa pine and some lodgepole pine distinguish this region from the higher ecoregions to the west where hemlock and fir forests are common, and the lower, drier ecoregions to the east where shrubs and grasslands are predominant. The vegetation is adapted to the prevailing dry, continental climate and frequent fire. Historically, creeping ground fires consumed accumulated fuel and devastating crown fires were less common in dry forests. Volcanic cones and buttes are common in much of the region. A few areas of cropland and pastureland occur in the lake basins or larger river valleys.

Central Basin and Range

The Central Basin and Range ecoregion is composed of northerly trending, fault-block ranges and intervening, drier basins. In the higher mountains, woodland, mountain brush, and scattered open forest are found. Lower elevation basins, slopes, and alluvial fans are either shrub- and grass-covered, shrub-covered, or barren. The potential natural vegetation, in order of decreasing elevation and ruggedness, is scattered western spruce-fir forest, juniper woodland, Great Basin sagebrush, and saltbush-greasewood. The Central Basin and Range is internally-drained by ephemeral streams and once contained ancient Lake Lahontan. In general, Ecoregion 13 is warmer and drier than the Northern Basin and Range (80) and has more shrubland and less grassland than the Snake River Plain (12). Soils grade upslope from mesic Aridisols to frigid Mollisols. The land is primarily used for grazing. In addition, some irrigated cropland is found in valleys near mountain water sources. The region is not as hot as the Mojave Basin and Range (14) and Sonoran Basin and Range (81) ecoregions and it has a greater percent of land that is grazed.

Mojave Basin and Range

Stretching across southeastern California, southern Nevada, southwest Utah, and northwest Arizona, Ecoregion 14 is composed of broad basins and scattered mountains that are generally lower, warmer, and drier than those of the Central Basin and Range (13). Its creosotebush-dominated shrub community is distinct from the saltbush–greasewood and sagebrush–grass associations that occur to the north in the Central Basin and Range (13) and Northern Basin and Range (80); it is also differs from the palo verde–cactus shrub and saguaro cactus that occur in the Sonoran Basin and Range (81) to the south. In the Mojave, creosotebush, white bursage, Joshua-tree and other yuccas, and blackbrush are typical. On alkali flats, saltbush, saltgrass, alkali sacaton, and iodinebush are found. On mountains, sagebrush, juniper, and singleleaf pinyon occur. At high elevations, some ponderosa pine, white fir, limber pine, and bristlecone pine can be found. The basin soils are mostly Entisols and Aridisols that typically have a thermic temperature regime; they are warmer than those of Ecoregion 13 to the north. Heavy use of off-road vehicles and motorcycles in some areas has made the soils susceptible to wind and water erosion. Most of Ecoregion 14 is federally owned and grazing is constrained by the lack of water and forage for livestock.

Klamath Mountains and California High North Coast Range

This physically and biologically diverse ecoregion covers the highly dissected ridges, foothills, and valleys of the Klamath and Siskiyou mountains. It also extends south in California to include the mixed conifer and montane hardwood forests that occur on mostly mesic soils in the North Coast Range mountains. The region's mix of granitic, sedimentary, metamorphic, and extrusive rocks contrasts with the predominantly volcanic rocks of the Cascades (4) to the east. It was unglaciated during the Pleistocene epoch, when it served as a refuge for northern plant species. The regions diverse flora, a mosaic of both northern Californian and Pacific Northwestern conifers and hardwoods, is rich in endemic and relic species. The mild, subhumid climate of the Klamath Mountains is characterized by a lengthy summer drought.

Northern Basin and Range

The Northern Basin and Range consists of dissected lava plains, rocky uplands, valleys, alluvial fans, and scattered mountain ranges. Overall, it is cooler and has more available moisture than the Central Basin and Range (13) to the south. Ecoregion 80 is higher and cooler than the Snake River Plain (12) to the northeast in Idaho. Valleys support sagebrush steppe or saltbush vegetation. Cool season grasses, such as Idaho fescue and bluebunch wheatgrass are more common than in Ecoregion 13 to the south. Mollisols are also more common than in the hotter and drier basins of the Central Basin and Range (13) where Aridisols support sagebrush, shadscale, and greasewood. Juniper woodlands occur on rugged, stony uplands. Ranges are covered by mountain brush and grasses (e.g. Idaho fescue) at lower and mid-elevations; at higher elevations aspen groves or forest dominated by subalpine fir can be found. Most of Ecoregion 80 is used as rangeland. The western part of the ecoregion is internally drained; its eastern stream network drains to the Snake River system.

Sonoran Basin and Range

Similar in topography to the Mojave Basin and Range (14) to the north, this ecoregion contains scattered low mountains and has large tracts of federally owned lands, a large portion of which are used for military training. However, the Sonoran Basin and Range is slightly hotter than the Mojave and contains large areas of palo verde-cactus shrub and giant saguaro cactus, whereas the potential natural vegetation in the Mojave is largely creosote bush. Other typical Sonoran plants include white bursage, ocotillo, brittlebush, creosote bush, catclaw acacia, cholla, desert saltbush, pricklypear, ironwood, and mesquite. Winter rainfall decreases from west to east, while summer rainfall decreases from east to west. Aridisols and Entisols are dominant with hyperthermic soil temperatures and extremely aridic soil moisture regimes.

7.3 General Hydrology

Using data from California EcoAtlas[60], State Water Board staff estimate that there are almost 4 million acres of wetlands and other waters throughout California. Table 7-1 shows the area of waters by type and region.

[60] California EcoAtlas is an interactive web based mapping tool that provides access to information for wetland management. http://www.ecoatlas.org/

Table 7-1: Area of Wetlands and other waters (in acres) by Water Board Region

Habitat Type	Central Coast	Central Valley	Colorado River	Lahontan	Los Angeles	North Coast	San Diego	San Francisc Bay
Beach, Dune, and Rocky Shore	8,849	58	0	0	2,661	8,813	2,589	3,2
Fluvial Channel	0	32,068	0	223	0	515	0	3,0
Lake, Reservoir and associated vegetation	24,102	588,500	273,175	673,525	13,334	67,655	12,332	16,4
Managed and Muted Tidal Habitats	311	0	0	0	9	0	926	
Playa	0	6	92,510	41,802	0	0	0	6,9
Estuarine Pond (many of these are managed, but not all)	0	0	0	0	0	0	0	24,7
Pond and associated vegetation	64,666	767,241	34,679	320,710	23,318	157,279	36,551	69,2
Slope and Seep Wetlands	0	111	0	2,251	0	1,544	0	5,6
Subtidal Water	1,918	446	0	0	5,580	13,399	14,055	257,6
Tidal Channel	0	36,291	0	0	0	0	0	8

Table 7-1: Area of Wetlands and other waters (in acres) by Water Board Region								
Tidal Flat and Marsh Panne	1,697	14	0	0	527	8,114	1,181	38,4
Tidal Marsh	3,467	64	0	0	1,529	6,641	1,830	43,7
Vernal Pool		41,410	0	0	0	2,629	0	5,0
Total	105,010	1,466,209	400,364	1,038,511	46,957	266,589	69,465	475,2
Source: California EcoAtlas; data based on landscape profiles (at the HUC-8 level) in California.								

Most of California is within one hydrological region as defined by the United States Geological Survey (USGS), but that region is further divided into the major bioregions described in Section 7.1, with 153 hydrological cataloging units (moderate-sized watersheds; Planert and Williams, 1995).[61]

Since the ultimate determinants of the availability of surface and groundwater resource within the individual Regional Water Boards is the climatic pattern, this section provides a brief overview of the key hydrological elements for California.

Precipitation

Much of the climatic variation in the state results from the patterns of global weather systems, oceanic influences, and the location and orientation of the mountains. As shown in Figure 15, northern California is much wetter than southern California, with more than 70% of the average annual precipitation and runoff occurring in the northern part of the state (California Department of Water Resources (DWR), 2003).

On average, about 75% of the annual precipitation in the state falls between November and March, with about 50% occurring between December and February. However, amounts of precipitation vary greatly from year to year, which can often make the services of surface water supplies undependable. The extreme northern part of California has slightly wetter summers than the rest of the state. Fog also occurs frequently on the coast and provides some additional moisture that is used primarily by vegetation.

Currently, California is in an extended dry period. Since 2007, there have been seven dry years, with record warm temperatures reducing normal snowpack levels. 2014 was the warmest year in 121 years recorded for California. Drought conditions were reached in 2012 and, although 2016 has been a wet year, the four year drought still persists.

[61] Further data and descriptions of the individual watersheds are available online from USGS (2011).

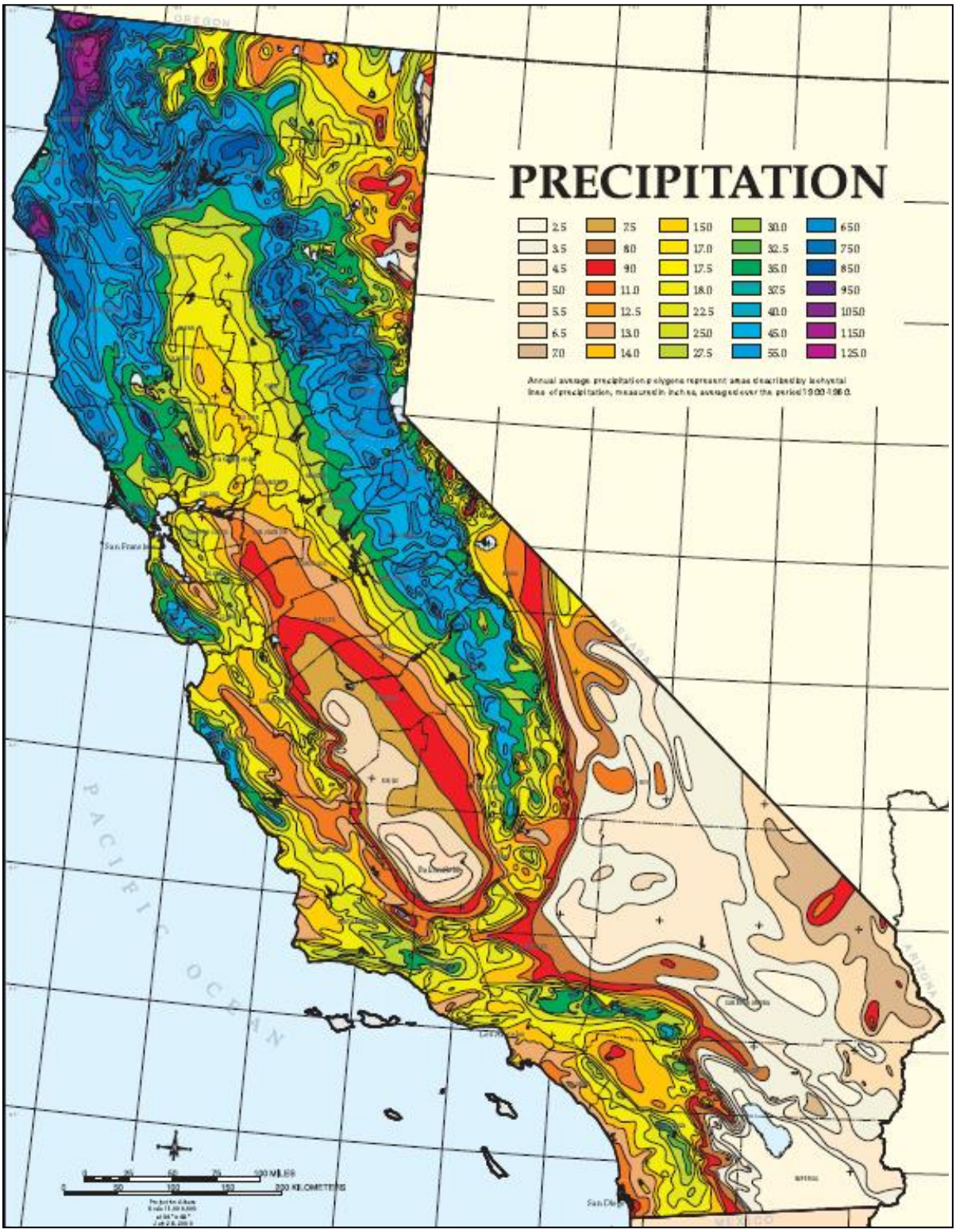


Figure 15. Annual Precipitation Rates in California (CDF, 2011)

Runoff

Runoff is the amount of water left from precipitation that can be measured as streamflow after losses to evaporation, transpiration by plants, and the replenishment of storage within the aquifers (Planert and Williams, 1995). The areal distribution of runoff closely follows the areal distribution of precipitation. Runoff is greatest in the mountains (exceeding 40 inches per year in many areas), where the majority of precipitation falls as snow, which melts during the spring and runs off with minimal evapotranspiration. In contrast, the basins in the arid parts of southeastern California have virtually zero runoff because most precipitation due to high rates of evaporation. However, high-intensity storms or rapid snowmelt in the mountains that border the basins may cause flash floods that reach the floors of the basins. Coastal areas have a direct relation between the amount of precipitation and runoff.

Water Surplus and Deficit

The relation between precipitation and evapotranspiration is a major factor in water availability. If annual precipitation exceeds annual potential evapotranspiration, then there is a net surplus of water and streamflow is perennial. Water is available to recharge aquifers only at times when precipitation or snowmelt is greater than actual evapotranspiration. However, annual potential evapotranspiration can exceed annual precipitation, which causes a net deficit of water. A net annual moisture deficit is present almost everywhere in California except the northern California coast (which receives considerable rainfall from winter storms) and the mountainous regions of northern and east-central California.

In most of southern California, nearly all streams that arise in the mountains are ephemeral and lose flow to alluvial aquifers within a short distance of where the streams leave the mountains and emerge onto the valley floors. Before the inception of agriculture, the largest rivers in the vast Central Valley of California overflowed their banks during periods of peak winter flows and formed extensive marshlands. An elaborate flood control system and the lowering of the water table by withdrawals for irrigation now keep these rivers within their banks and have significantly affected the distribution of riparian wetlands.

7.4 Hydrologic Regions of California

Hydrologists divide California into hydrologic regions (Figure 16). The Regional Water Boards are defined (for the most part[62]) by the boundaries of these hydrologic regions, as described in Water Code §13200. Hydrologic regions are further divided into hydrologic units, hydrologic areas, and hydrologic subareas.

[62] The South Coast hydrologic region is divided among 3 Regional Water Boards (Los Angeles, Santa Ana, and San Diego) because it is the most populous area of the state.

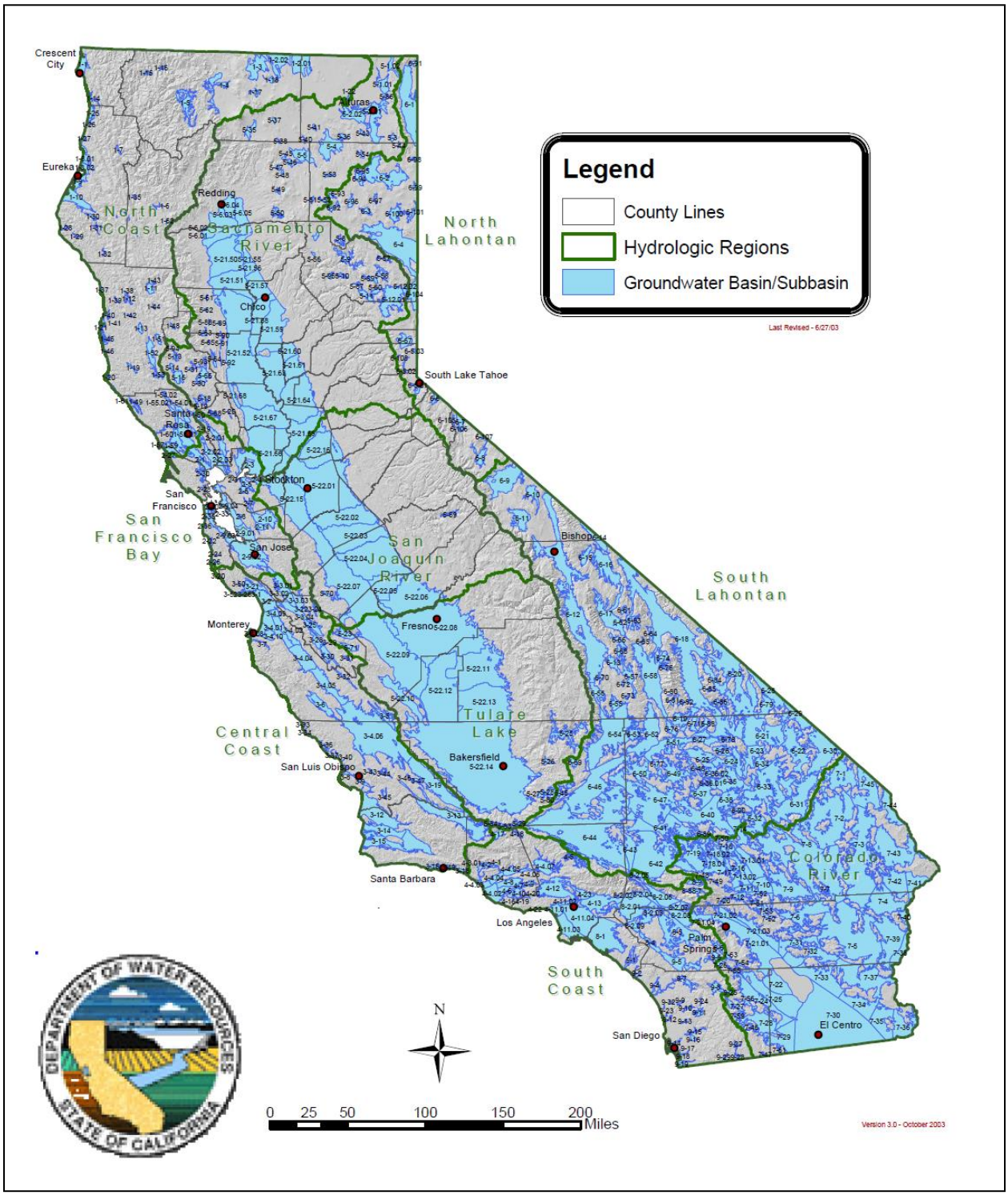


Figure 16. Hydrologic Regions and Groundwater in California (California DWR, 2003)

North Coast Hydrologic Region

A majority of the surface water in the North Coast hydrologic region is committed to environmental uses because of the "wild and scenic" designation of most of the region's rivers. Average annual precipitation in this hydrologic region ranges from 100 inches in the Smith River drainage to 29 inches in the Santa Rosa area.

Waterbodies that provide municipal water include the Smith, Mad, and Russian Rivers. Areas providing agricultural water are more widespread than those for domestic, municipal and industrial use, as they occur in all of the hydrologic units within the region. Many of the smaller communities and rural areas are generally supplied by small local surface water and groundwater systems. Water recreation occurs in all hydrologic units on both fresh and salt water, attracting over ten million people annually. Coastal areas receiving the greatest recreational use are the ocean beaches, the lower reaches of rivers draining to the ocean, and Humboldt and Bodega Bays. The Russian, Eel, Mad, Smith, Trinity, and Navarro Rivers and Redwood Creek provide the most freshwater recreational use.

Groundwater aquifers in the northeastern portion of the North Coast hydrologic region consist primarily of volcanic rock aquifers and some basin-fill aquifers. Coastal basin aquifers are predominantly found in the southern portion of this hydrologic region and along the northern coast. In general, though, a large percentage of this region is underlain by fractured hard rock zones that may contain localized sources of groundwater.

San Francisco Bay Hydrologic Region

Major rivers in the San Francisco Bay hydrologic region include the Napa and Petaluma, which drain to San Francisco Bay. Although this is the smallest hydrologic region in the state, it contains the second largest human population. Coastal basin aquifers are the primary type of aquifer system in this region. These aquifers can be found along the perimeter of San Francisco Bay extending southeast into the Santa Clara Valley, as well as in the Livermore Valley. The northeastern portion of this region, which includes the eastern Sacramento–San Joaquin Delta, is underlain by a portion of the Central Valley aquifer system. The remaining areas in this region are underlain by fractured hard rock zones.

Central Coast Hydrologic Region

Groundwater is the primary source of water in the Central Coast hydrologic region, accounting for approximately 75% of the annual supply. Most of the freshwater in this region is found in coastal basin aquifers, with localized sources of groundwater also occurring in fractured hard rock zones throughout the region.

South Coast Hydrologic Region

The South Coast hydrologic region is divided among 3 Regional Water Boards because it is the most populous area of the state: Los Angeles, Riverside, and San Diego. Groundwater supplies approximately 23% of the region's water in normal years and about 29% in drought years. Like the Central Coast hydrologic region, the majority of aquifers in this region are coastal basin aquifers. In the eastern central

portion of the region includes lies a small section of basin and range aquifer and the remainder of the region is comprises fractured hard rock zones.

Central Valley Hydrologic Region

The Central Valley hydrologic region is the largest in California, and encompasses the three subregions described below.

Sacramento River Hydrologic Subregion

The Sacramento River hydrologic subregion includes the entire drainage area of the Sacramento River, the largest river in California, and its tributaries. Groundwater in the northern half of this hydrologic subregion is, for the most part, contained in volcanic rock aquifers and some basin-fill aquifers. The southwestern half of this subregion is underlain by part of the Central Valley aquifer system. The remaining areas that comprise the southeastern half of the subregion and portions of the northern half of the subregion are underlain by fractured hard rock zones. Surface water quality in this hydrologic subregion is generally good. Groundwater quality in the Sacramento River subregion is also generally good, although there are localized problems.

San Joaquin River Hydrologic Subregion

A portion of the Central Valley aquifer system underlies nearly all of the eastern half of the San Joaquin River subregion, while the western half of this subregion consists of fractured hard rock zones. The groundwater quality throughout this hydrologic region is generally good and usable for most urban and agricultural uses, although localized problems occur.

Tulare Lake Hydrologic Subregion

A small area at the southern end of the Tulare Lake subregion is underlain by basin and range aquifers, while a majority of the western half is underlain by a portion of the Central Valley aquifer system. The eastern half, once again, consists of fractured hard rock zones.

Lahontan Hydrologic Region

The Lahontan hydrologic region encompasses two subregions: the North Lahontan and the South Lahontan.

The North Lahontan hydrologic subregion consists of the western edge of the Great Basin, and water in the region drains eastward toward Nevada. Groundwater in the northern half of this subregion is primarily contained in basin-fill and volcanic rock aquifers, with some fractured hard rock zones. The southern half of this region is dominated by fractured hard rock zones, but small segments of basin and range aquifers also exist in this part of the subregion.

In general, the water quality in the North Lahontan hydrologic region is good. In basins in the northern portion of the region, groundwater quality is widely variable. The groundwater quality along these basin margins tends to be of higher quality, but the potential for future groundwater pollution exists in urban

and suburban areas where single-family septic systems have been installed, especially in hard rock areas. Groundwater quality in the alpine basins ranges from good to excellent.

The South Lahontan hydrologic subregion is bounded on the west by the crest of the Sierra Nevada and on the north by the watershed divide between Mono Lake and East Walker River drainages; on the east by Nevada and the south by the crest of the San Gabriel and San Bernardino mountains and the divide between watersheds draining south toward the Colorado River and those draining northward. The subregion includes all of Inyo County and parts of Mono, San Bernardino, Kern, and Los Angeles Counties.

The South Lahontan hydrologic subregion contains numerous basin and range aquifers, separated by fractured hard rock zones. Although the quantity of surface water is limited in the South Lahontan hydrologic subregion, the quality is very good, being greatly influenced by snowmelt from the eastern Sierra Nevada. However at lower elevations, groundwater and surface water quality can be degraded, both naturally from geothermal activity, and as a result of human-induced activities. Drinking water standards are most often exceeded for TDS, fluoride, and boron content. Groundwater near the edges of valleys generally contains lower TDS content than water beneath the central part of the valleys or near dry lakes.

8. ENVIRONMENTAL IMPACTS

This section describes the potential environmental impacts of the proposed Procedures in compliance with 23 CCR 3777 which requires that the Water Boards identify significant or potentially significant adverse environmental impacts of any state policy for water quality control proposed for board approval. This Staff Report evaluates the proposed Procedures on a programmatic level. As such, this Staff Report is not as detailed as an environmental document would be for a specific project that would be regulated under the proposed Procedures. State regulations allow a program-level environmental document to be prepared on a series of actions that can be characterized as one large project and related in connection with issuance of rules, regulations, plans, or other general criteria to govern the conduct of a continuing program (CEQA Guidelines,[63] §15168(a)(3)).

CEQA does not require individual project-level analysis until proposals for such projects exist (PRC 21159(d); 23 CCR 3777(c)), and the lead agency, with primary responsibility for those projects, will conduct any required analysis at that time. Lead agencies evaluating future projects subject to CEQA may draw upon the analytical approach or appropriate general impacts from this draft Staff Report for initial planning. However, the State Water Board expects future environmental reviews of projects that are subject to the requirements of the proposed Procedures to identify project-specific environmental effects. At that time, the lead agency must identify any project-specific environmental effects, and adopt all feasible mitigation for these effects, and if no feasible mitigation or alternatives are available the lead agency must adopt a statement of overriding considerations before approving the project.

Staff could not predict the exact nature of environmental impacts because such forecasting would require knowledge about future projects (e.g., scope, scale, location, and design) throughout the state.[64] However, the assessment below may be representative of the types and magnitude of most project-specific environmental impacts.

8.1 Aesthetics

CEQA requires that the lead agency consider aesthetics in determining the effects of a project. The purpose of assessing aesthetics is to identify and evaluate key visual resources in the project area, and determine the degree of visual impact that would be attributable to a proposed project. For example, CEQA requires assessment of whether a project has the potential to affect or degrade scenic vistas (e.g.,

[63] http://resources.ca.gov/ceqa/guidelines/

[64] According to 23CCR3777(c), the "environmental analysis shall take into account a reasonable range of environmental, economic, and technical factors, population and geographic areas, and specific sites, but the board shall not be required to conduct a site-specific project level analysis of the methods of compliance, which CEQA may otherwise require of those agencies who are responsible for complying with the plan or policy when they determine the manner in which they will comply."

coastal vistas), scenic resources associated within a scenic highway, or the visual character or quality of a site and its surroundings.

Table 8-1 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-1. Aesthetics Categorical Impacts and Significance Determinations	
Impact Questions	**Significance Determination**
a) Would the project have a substantial adverse effect on a scenic vista?	LTS
b) Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?	LTS
c) Would the project substantially degrade the existing visual character or quality of the site and its surroundings?	LTS
d) Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?	LTS
LTS=Less than significant	

As discussed in Section 6, "Project Description," the proposed Procedures may lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. More of the natural landscape would be undisturbed and, as such, there would be less potential for impact to visual resources.

The proposed Procedures could shift development to upland areas away from wetlands and other waters of the state, or to areas where development wouldn't have occurred in the absence of the proposed Procedures. However, the State Water Board does not have information on the location of future projects. In many cases, project proponents will consider potential impacts to aesthetics under the CEQA process.

Further, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 5 Project Background, the State Water Board determined that the effect of the proposed Procedures on aesthetics would be less than significant.

8.2 Agriculture and Forest Resources

The Agriculture and Forest Resources category addresses the potential of a project to impact federal and state designated farmland and forest areas, and to convert these lands to other uses. More than 1.3 million acres of agricultural land in California has been converted to nonagricultural land use since 1984, according to the California Farmland Conversion Report for 2006 – 2008 (California Department of Conservation, 2011). This acreage represents an area larger in size than Merced County or a rate of one

square mile every four days. The largest losses have been in Prime Farmland and Grazing Land, while Unique Farmland has shown a small net increase since 1984.

Figure 17 shows a map of important farmland in 2010 created by the Farmland Mapping and Monitoring Program. Much of the state's important farmland is located in the Sacramento and San Joaquin Valleys extending from Red Bluff in the north to just past Bakersfield in the south. Much of the state's grazing land is located in Tehama and Mendocino counties and along the edges of Sacramento and San Joaquin Valleys. The percentage of important farmland in the counties that have a projected growth rate of greater than 100% (as described in Section 8.13) is Sutter: 73%; Madera: 42%; Kern: 17%; Yuba: 20%; San Joaquin: 67%; Merced: 47%; Imperial: 52%.

Figure 18 shows a map of federal lands in California, which include national forest. Much of the national forest land is located in the Sierra Nevada mountain range, as well as the Klamath Mountains in northern California. Some national forest land is also located in the Transverse and Peninsular mountain ranges in southern California.

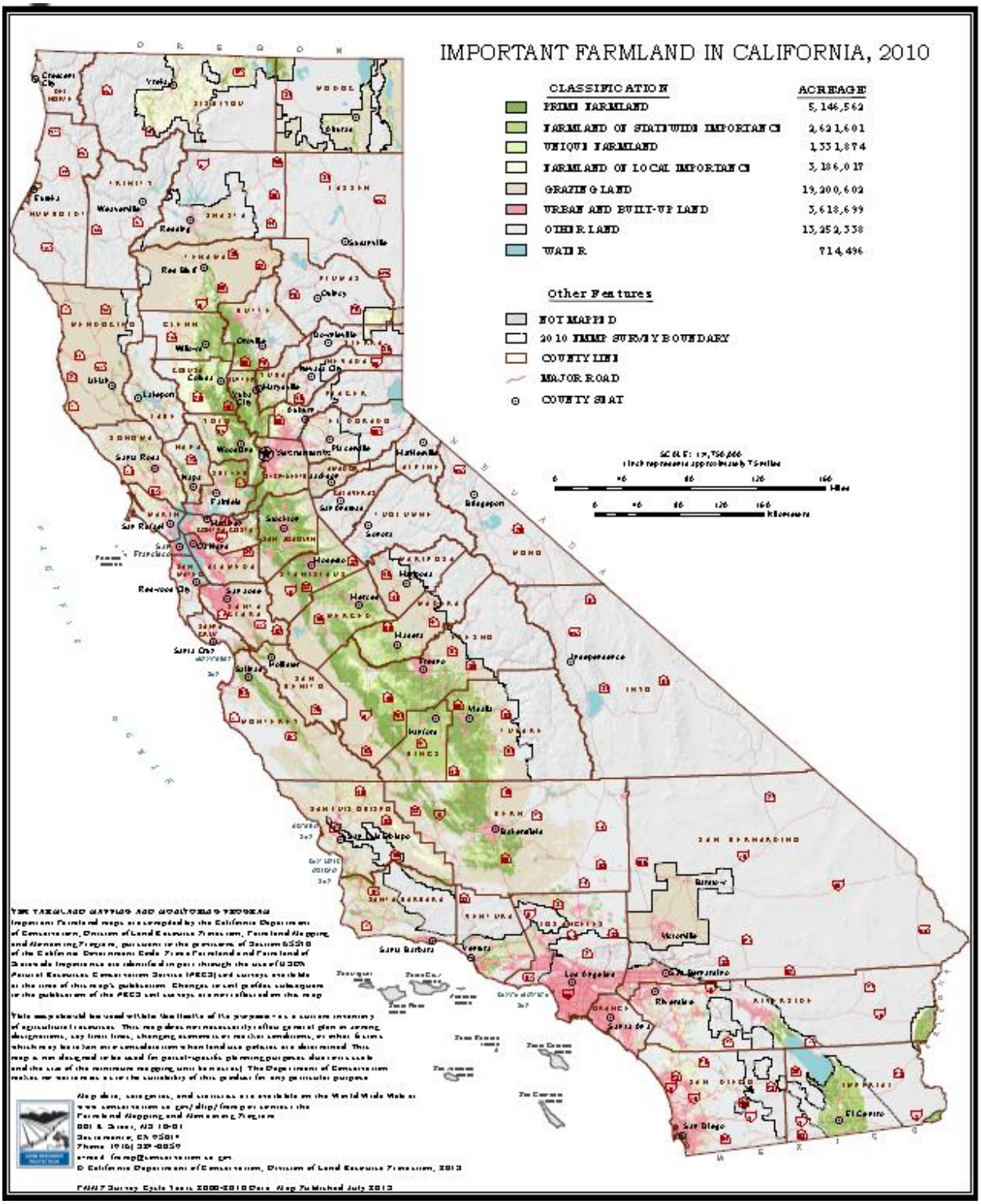

IMPORTANT FARMLAND IN CALIFORNIA, 2010
CLASSIFICATION
ACREAGE
PRIME FARMLAND
5,146,562
FARMLAND OF STATEWIDE IMPORTANCE
2,621,601
UNIQUE FARMLAND
1,331,874
FARMLAND OF LOCAL IMPORTANCE
3,186,017
GRAZING LAND
19,200,602
URBAN AND BUILT-UP LAND
3,618,699
OTHER LAND
13,252,338
WATER
714,496
Other Features
NOT MAPPED
2010 FRAP SURVEY BOUNDARY
COUNTY LINE
MAJOR ROAD
COUNTY SEAT

Figure 17. Important Farmland in California, 2010 (Source: Farmland Mapping and Monitoring Program)

nationalatlas.gov™
Where We Are
CALIFORNIA
FEDERAL LANDS AND INDIAN RESERVATIONS
Bureau of Indian Affairs
Bureau of Land Management / Wilderness
Bureau of Reclamation
Department of Defense (includes Army Corps of Engineers lakes)
Fish and Wildlife Service / Wilderness
Forest Service / Wilderness
National Park Service / Wilderness
Some small sites are not shown, especially in urban areas.
MILES
0 25 50 75 100 125 150
Albers equal area projection
Abbreviations
AFB Air Force Base
IR Indian Reservation
MCAS Marine Corps Air Station
MCB Marine Corps Base
NAF Naval Air Facility
NAS Naval Air Station
NF National Forest
NHS National Historic Site
NM National Monument
NP National Park
NRA National Recreation Area
NS Naval Station
NTC Naval Training Center
NWR National Wildlife Refuge
Res Reservoir
WMA Wildlife Management Area
OREGON
NEVADA
UTAH
ARIZONA
MEXICO
PACIFIC OCEAN
Redding
Chico
Sacramento
San Francisco
Oakland
San Jose
Los Angeles
Long Beach
San Diego
U.S. Department of the Interior
U.S. Geological Survey
The National Atlas of the United States of America®

Figure 18. Federal Lands and Indian Reservations in California

Table 8-2 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-2. Agriculture and Forestry Impacts and Significance Determinations	
Impact Questions	**Significance Determination**
a) Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?	LTS
b) Would the project conflict with existing zoning for agricultural use, or a Williamson Act contract?	LTS
c) Would the project conflict with existing zoning for, or cause rezoning of, forest land or timberland?	LTS
d) Would the project result in loss of forest land or conversion of forest land to non-forest use?	LTS
e) Would the project involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland, to non-agricultural use or conversion of forest land to non-forest use?	LTS
LTS=Less than significant	

The CWA section 404(f) exempts certain farming, ranching, and silviculture activities as does the proposed Procedures. Thus, these described activities and the effects of the activities on land conversion and zoning would not be subject to the proposed Procedures.

As discussed in Section 6, "Project Description," the proposed Procedures could shift proposed development to upland areas away from wetlands and other waters of the state, or to areas where development wouldn't have occurred in the absence of the proposed Procedures. The existing regulatory framework relevant to converting agricultural and forest land to other uses includes the California Land Conservation Act of 1965 (Government Code §51200 et seq.), commonly known as the Williamson Act. The Williamson Act provides a tax incentive for the voluntary enrollment of agricultural and open space lands in contracts between local government and landowners. The contract language restricts the land to agricultural and open space uses or other compatible uses defined in state law and local ordinances. Landowners would have to cancel Williamson Act contracts, and the land would have to be on the market for development, for such sites to be included in alternatives analyses to the dredge and fill of wetlands, and other waters of the state.

The State Water Board does not have information on the location of future projects. In many cases, project proponents will consider potential impacts to agricultural or forest resources under the CEQA process. Further, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 8.2,

the State Water Board determined that the effect of the proposed Procedures on agriculture and forestry resources would be less than significant.

8.3 Air Quality

Under the CEQA Guidelines, the Air Quality evaluation considers the impacts of a project on ambient air quality and the exposure of people, especially sensitive individuals, to hazardous pollutant concentrations and/or possible violations of air quality standards or regional attainment of such standards. These pollutants include criteria pollutants and toxic air contaminants.[65]

Table 8-3 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-3. Air Quality Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project conflict with or obstruct implementation of the applicable air quality plan?	LTS
b) Would the project violate any air quality standard or contribute substantially to an existing or projected air quality violation?	LTS
c) Would the project expose sensitive receptors to substantial pollutant concentrations?	LTS
d) Would the project result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?	LTS
e) Would the project create objectionable odors affecting a substantial number of people?	LTS
LTS = less than significant	

As discussed in Section 6, "Project Description," the proposed Procedures could shift proposed development to upland areas away from wetlands and other waters of the state, or to areas where development wouldn't have occurred in the absence of the proposed Procedures. The use of construction equipment could result in some or all of the impacts listed above in areas where projects wouldn't have been in the absence of the proposed Procedures. Most of the counties with high projected growth rates as discussed in Section 7, "Environmental Setting," are also counties designated

[65] The criteria pollutants include those regulated by federal and state laws: ozone, carbon monoxide, suspended particulate matter, oxides of nitrogen, and sulfur dioxide. State regulations identify additional toxic air contaminants (i.e., particulate matter from diesel-fueled engines, asbestos, chlorinated organic compounds, metals, radon and iodine gas, and other contaminants).

for nonattainment of national ambient air quality standards for one or more criteria air pollutants as of December 2013 (USEPA, 2013b). Overall, however, small locational changes would not cause an increase in air emissions in California as the proposed Procedures would not increase the total number of projects in California. In many cases, project proponents will consider potential impacts of air quality under the CEQA process.

Further, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description," the State Water Board determined that the effect of the proposed Procedures on air quality would be less than significant.

8.4 Biological Resources

California contains a wide variety of terrestrial and aquatic habitats that are home to numerous indigenous and/or sensitive plant and animal species. This section focuses primarily on wetland habitats, but because the proposed Procedures would regulate all waters of the state, and may influence the location of future projects and the quantity of compensatory mitigation sites that may be constructed, most habitats in California are potentially relevant to this analysis. Section 7 describes the environmental setting in detail.

Wetland Habitats

As noted in Section 5, "Project Background," wetlands serve numerous critical ecological functions. Wetlands provide habitat for a variety of plant and animal species, some of which are threatened or endangered. California historically had a vast quantity of wetlands, of which greater than 90 percent have been lost since European settlement. In recent years, largely due to compensatory mitigation policies, net wetland losses have slowed, but compensatory mitigation wetlands have not always succeeded in replicating the functions of the natural wetlands they replace.

Table 8-4 shows the acreage of wetlands in California by wetland type according to a report on the state's wetlands released by the California Natural Resources in 2010. The total in Table 8-4 is slightly higher than the total wetland acreage from EcoAtlas data shown in Table 8-4, or 2,175, 249 acres (all habitat types except fluvial channel, and lake, reservoir, and associated vegetation). The data from EcoAtlas comes from CARI v0, or the California Aquatic Resource Inventory. CARI represents a compilation of the best available local, regional, and statewide maps of surface waters. Datasets used in CARI include the National Wetland Inventory (NWI) of the U.S. Fish and Wildlife Service and the National Hydrography Dataset (NHD) of the U.S. Geological Survey, as well as maps from regional and local agencies. CARI is likely more accurate than the data from the 2010 State of the State Wetland Report, although CARI is still not a complete representation of California's wetlands as the maps contributing to CARI v0 vary in detail and accuracy, and they represent different time periods, different areas of the state, and different classification systems. These differences greatly complicate the efforts to accurately assess total amounts and over time as map base layers are updated. These measures will improve as

CARI v0 is replaced by CARI v1, which is based on a standardized mapping approach developed by statewide experts and implemented regionally to meet the needs of local land use planners and managers.

Palustrine wetlands, which are what most people, think of when hearing the term "wetland," make up more than half of all wetlands in California. Most palustrine wetlands lack flowing waters and are dominated by vegetation, but the category also includes small, shallow wetlands without vegetation (Figure 19, Cowardin et al., 1979). The palustrine category covers a variety of wetlands including marsh, swamp, bog, fen, and prairie wetlands as well as small, shallow, permanent or intermittent waterbodies (Cowardin et al., 1979).

Table 8-4. Summary of Acreage by Wetland Type in California

Wetland Type	**Wetland Area (acres)**
Intertidal beaches and rocky shoreline	10,365
Saline and brackish estuarine wetlands	159,534
Palustrine (playas, ponds, wet meadows, etc.)	1,751,212
Lacustrine (wetlands associated with lakes and reservoirs)	740,240
Streams, rivers, canals, etc.	251,150
Total	2,912,501
Source: California Natural Resources Agency (2010)	

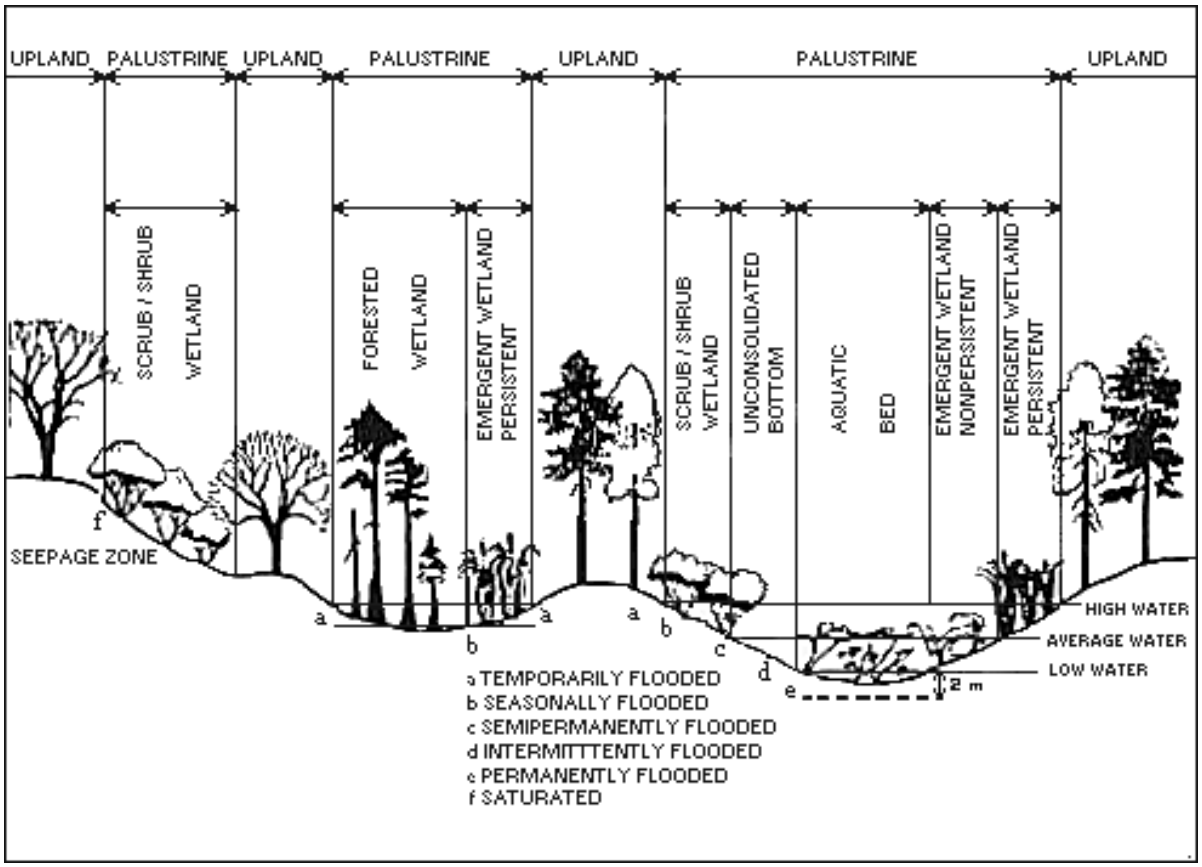


Figure 19. Distinguishing features and examples of habitats in the Palustrine System (Cowardin et al., 1979)

Biodiversity and Special Status Species

Bunn et al. (2007) report that California has more biodiversity, in terms of number of species, than any other state in the country. The California Natural Diversity Database (CNDDB) tracks species endemic to the state. As of November 3, 2011, the CNDDB contained records for 13,374 species of animals, 44,554 species of plants, 179 species of lichens, 398 species of fungi, and 45 species of algae and diatoms (CNDDB, 2014). The list of species tracked in CNDDB is not comprehensive, so it is likely that numerous other species exist in the state.

Some of this biodiversity includes special status species listed as threatened or endangered at the federal or state level, or are otherwise considered to be rare or at risk in California. As of January 2011 (the most recent update to the list of special status animal species), there were 898 taxa of special status animals. As of April 2014, there were 149 state and/or federally listed threatened and endangered (T&E) animal species, of which 49 appear on both lists. As of April 2014 (the most recent update to the list of special status plant species), there were 32 bryophytes, 10 lichens, and approximately 2,200 vascular plants on the list (CNDDB, 2014). This list includes 218 state-listed T&E plants and 184 federally-listed T&E plants, with 122 of these appearing on both lists.

Nationally, wetlands comprise less than 10 percent of the landscape, but provide important habitat for 68 percent of T&E birds, 66 percent of T&E mussels, and 75 percent of T&E amphibians (Perkins et al. 2005). In California, wetlands support 41 percent of the State's rare and endangered species, including 55 percent of T&E animal species and 25 percent of T&E plant species (WEF 2000).

Significance Determination

Adverse environmental impacts to biological resources could be significant if, relative to the existing conditions, implementation of the proposed Procedures would result in:

- Potential modification or destruction of habitat, breeding areas, or movement corridors for any special status species;
- Potential adverse impacts or any measurable degradation of wetlands, sensitive vegetation communities, riparian habitats, or protected habitats;
- Potential mortality of a number of members of any species substantial enough to affect a species' viability, abundance, or diversity, including any direct or indirect mortality of special status species;
- Potential conflicts with any provisions of an adopted NCCP, HCP, or other approved plan to conserve habitat; or
- Potential conflicts with any local ordinances designed to protect biological resources.

Table 8-5 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-5. Biological Resources Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project have a substantial adverse effect, either directly or through habitat modification, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the CDFW or USFWS?	NI
b) Would the project have a substantial adverse effect on any aquatic resource, including adjacent riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the CDFW or USFWS?	NI
c) Would the project have a substantial adverse effect on State or federally-protected wetlands as defined by various State regulations and §404 of the CWA (including but not limited to marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption or other means?	NI
d) Would the project have substantial interference with the movement of any native resident or migratory fish or wildlife species or within established native resident or migratory corridors, or impede the use of native wildlife nursery sites?	LTS

e) Would the project conflict with any local policies or ordinances protecting biological resources, such as tree preservation projects or ordinances?	NI
f) Would the project conflict with the provision of an adopted HCP, NCCP, or other approved local, regional, or State plan?	NI
NI = No Impact	

The proposed Procedures would provide consistent identification of wetlands, and strengthen efforts to avoid and minimize impacts to wetlands that are waters of the state through evaluation of alternatives to identify and implement the LEDPA. This consistency may result in a greater effort to avoid wetland impacts, potentially resulting in the protection and retention of a greater proportion of natural wetlands and other waters of the state relative to existing policy. The proposed Procedures also require a watershed approach to mitigation and incentivize compliance with Water Board approved watershed plans by reducing mitigation requirements. Improved wetland protection may increase protection of species identified as a candidate, sensitive, or special status species.

The proposed Procedures have the potential to shift projects or activities to upland areas away from wetlands. The State Water Board does not have information on the location of future projects or the effect of upland project locations relative to sensitive species or habitats. However, selection of the LEDPA would avoid more damaging impacts to sensitive species or habitats since the LEDPA must consider all environmental impacts. In addition, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 8.4, the State Water Board determined that the effect of the proposed Procedures on protected species would have no significant impact.

Similarly, the proposed Procedures will strengthen efforts to avoid and minimize impacts to adjacent riparian habitats or state and federally-protected wetlands. This will result in the protection and retention of a greater proportion of these wetland and riparian areas relative to existing policy. Therefore, the proposed Procedures would not have significant impact on these resources.

Adverse impacts to the movement of native resident or migratory fish or wildlife species are most likely to occur when natural habitats are altered or destroyed. The proposed Procedures would increase protection of natural wetlands and other waters of the state; therefore it would protect movements of native resident or migratory species in these habitats. The proposed Procedures have the potential to shift projects or activities to upland areas away from wetlands and other waters of the state, and it is possible that projects could affect some migratory wildlife species within migratory corridors. The State Water Board does not have information on the location of future projects or the effect of upland project locations on wildlife migration. However, selection of the LEDPA would avoid more damaging impacts to the movement of species. As noted above, there will be a relatively small number of projects to which selection of the LEDPA will apply under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, “Project Description.” Accordingly, the State Water Board

determined that the effect on the proposed Procedures on ecological migration would be less than significant.

Finally, the proposed Procedures would strengthen efforts to avoid and minimize impacts to wetlands and other waters of the state by requiring an evaluation of alternatives to identify and implement the LEDPA. This process will avoid or reduce conflicts with policies, regulations, and planning documents, including HCPs, NCCPs, or other similar plans. The proposed Procedures would have no significant adverse impact for these issues.

8.5 Cultural Resources

The purpose of the Cultural Resources evaluation is to identify and evaluate the potential for a project to adversely affect paleontological, archaeological, and historical resources.[66] National, state, or local authorities may designate a cultural resource as significant. The resources of concern include, but are not limited to, fossils, prehistoric and historic artifacts, burials, sites of religious or cultural significance to Native American groups, and historic structures.

Table 8-6 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-6. Cultural Resources Categorical Impacts and Significance Determination

Impact Questions	**Significance Determination**
a) Would the project cause a substantial adverse change in the significance of a historical resource as defined in section 15064.5?	NI
b) Would the project cause a substantial adverse change in the significance of an archaeological resource pursuant to section 15064.5?	NI
c) Would the project directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?	NI
d) Would the project disturb any human remains, including those interred outside of formal cemeteries?	NI
NI = No Impact	

As discussed in Section 6, "Project Description," the proposed Procedures would potentially lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. As a consequence of the adoption of the proposed Procedures, more of the natural

[66] The CEQA Guidelines define a historical resource as: (1) a resource in the Register of Historical Resources; (2) a resource included in a local register of historical resources, as defined in PRC §5020.1(k) or identified as significant in a historical resource survey meeting the requirements of PRC §5024.1(g); or (3) any object, building, structure, site, area, place, record, or manuscript that a lead agency determines to be historically significant or significant to California. Archaeological resources may refer to an archaeological artifact, object, or site as defined in CEQA §21083.2.

landscape adjacent to and including waters of the state would be undisturbed and as such, there would be less potential for impact to cultural resources associated with these areas.

The proposed Procedures could shift development to upland areas away from wetlands and other waters of the state. However, the State Water Board does not have information on the location of future projects. In many cases, project proponents will consider potential impacts to cultural resources under the CEQA process.

Further, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description," the State Water Board determined that the effect of the proposed Procedures on cultural resources would have no impact.

8.6 Geology and Soils

The changes associated with the proposed Procedures would be implemented within the existing framework of regulations surrounding the maintenance of the state's soil resources. There are many regulatory protections and policies that address erosion and retention of natural topsoil. These include, but are not limited to: soil conservation and agricultural best management practices, permitting of excavation, construction, and road building activities, flood control and stormwater management and pollution prevention plans, forestry harvesting practices, and local land use regulations requiring counties and cities to adopt land use plans that address the conservation and development of soils among other natural resources. The resources of interest are the geologic conditions, soil resources, and surface and sub-surface features found in the state.

The topographic diversity within geological provinces combined with the geologic weathering process break down rock material to produce a variety of soils. Some of these soils are 'residual' in that they've formed in place above bedrock as opposed to being transported from elsewhere (Carle, 2010). However, sediments from the regular weathering of the state's mountain ranges are frequently carried via major river systems and deposited in areas of lower elevation (DeCourten, n.d.). The topographic diversity in California in combination with an abundance of exposed sandy soils encourages this phenomenon. As a result of this transport, California is relatively vulnerable to erosion (Natural Resource Conservation Service (NRCS), 2003). Erosion may also be the result of anthropogenic activities such as construction, land clearing, farming, forestry and hydrologic engineering (NRCS, 2003).

Table 8-7 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-7. Geology and Soils Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving:	NI

i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42.	NI
ii. Strong seismic ground shaking?	NI
iii. Seismic-related ground failure, including liquefaction?	NI
iv. Landslides?	NI
b) Would the project result in substantial soil erosion or the loss of topsoil?	LTS
c) Would the project be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse?	NI
d) Would the project be located on expansive soil, as defined in Table 18-1-B of the Uniform Building Code (1994), creating substantial risks to life or property?	NI
e) Would the project have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water?	NI

The State Water Board expects that the proposed Procedures would have no impacts relative to seismic risk issues (i.e., it would not increase the number or extent of populations or structures exposed to adverse seismic conditions). Therefore, this analysis is restricted to consideration of impacts to soil resources. Discussions of the decision-making regarding the level of significance for selected individual categorical impacts are provided below.

The State Water Board intends for the proposed Procedures to provide consistent identification of wetlands, and strengthen efforts to avoid and minimize impacts to wetlands and other waters of the state through evaluation of alternatives to identify and implement the LEDPA. This consistency may result in the protection and retention of a greater proportion of natural wetlands and other waters relative to the existing regulatory framework. Since trapping sediments moved by flooding or rain is a common service provided by wetlands and riparian areas, the proposed Procedures would result in reduction of soil erosion in many locations.

The proposed Procedures have the potential to shift projects to upland areas away from wetlands and other waters of the state. However, the State Water Board does not have information on the location of future projects or the effect of upland project locations on potential erosive soils. Also, selection of the LEDPA process, along with other relevant environmental regulations, would avoid selection of sites with

adverse alternatives. In addition, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description," the State Water Board determined that the effect on the proposed Procedures on erosion would be less than significant.

The proposed Procedures may result in retaining intact more natural aquatic resources through a shift in development activities to upland areas. However, the State Water Board does not have information on the location of future projects or the effect of upland project locations on potential unstable or expansive soils. By directing development away from wetlands (and associated hydric soils), the proposed Procedures should have no significant effect on the ability of development to support on-site wastewater disposal systems. Selection of the LEDPA under the proposed Procedures, together with other appropriate local regulations (zoning, building codes, sanitary laws, etc.), would avoid selection of such alternatives. Overall, staff determined that the soil impact issues would not be significant.

8.7 Greenhouse Gas Emissions

The term "greenhouse effect" refers to the process by which greenhouse gases (GHGs), including CO_2, methane, ozone, water vapor, nitrous oxide, and chlorofluorocarbons, insulate the earth by reflecting light and infrared radiation back to earth. Some GHGs are also stored ("sequestered") outside the atmosphere through natural processes. Two major natural providers of carbon sequestration include plants by assimilation of atmospheric carbon into structural organic carbon (vegetation, stems, roots) via photosynthesis, and the oceans via deposition of organic carbon in sediments at the ocean floor.

Human activities have increased atmospheric concentrations of GHGs both directly, through the emissions associated with combustion of fossil fuels, and indirectly, through the degradation and destruction of natural resources that sequester GHGs outside the atmosphere (i.e., carbon sinks). As atmospheric concentrations of GHGs continue to rise due to human activity, so will global climate change, which may increase average temperatures. These changes could have the following impacts:

- Human health impacts, including those associated with increased frequency of air quality issues, increased number of extreme heat events, and increased conditions favorable to disease vectors (World Health Organization, 2003; Intergovernmental Panel on Climate Change (IPCC), 2007);
- Sea level rise, resulting in increases in coastal flooding events (Heberger et al. 2009);
- Increased variability in local and regional weather patterns and flooding events (IPCC 2007);
- Increased water shortfalls as a result of decreased snowfall in the Sierra Nevada mountain range (California DWR, 2008); and
- Changes in habitat distributions, species ranges, and invasive species vulnerability (IPCC 2007).

Wetlands sequester atmospheric carbon in living vegetation and by converting fine rocks, sediments, and mineral deposits and litter to organic rich soils. Wetlands also release methane, a GHG, through the activity of bacteria present in flooded wetlands. Climate scientists debate whether wetlands are climate neutral where increases in carbon storage are offset by increases in methane production. However, there is general agreement that the role of wetlands in storing vast amounts of carbon, especially in peat land, is crucial to reducing atmospheric carbon.

For GHG emissions, a categorical impact is significant if, relative to existing policy, implementation of the Project would result in:

- Generation of significant quantities of GHG emissions, directly or indirectly, that may have a significant impact on the environment, or
- Conflict with any applicable plan, project, or regulation of an agency adopted for the purpose of reducing the emissions of GHGs.

Table 8-8 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-8. Greenhouse Gas Emissions Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment?	LTS
b) Would the project conflict with any applicable plan, project, or regulation of an agency adopted for the purpose of reducing the emissions of greenhouse gases?	NI

The proposed Procedures would provide consistent identification of wetlands, and strengthens efforts to avoid and minimize impacts to wetlands, and other waters of the state, through evaluation of alternatives to identify and implement the LEDPA. As noted above, natural wetlands functions both as a carbon sink through sequestration and as a GHG source through natural methane release. However, the proposed Procedures would retain current wetlands rather than increase wetland area, so the present carbon balance would be maintained.

The proposed Procedures have the potential to shift projects or activities to upland areas away from wetlands and other waters of the state. However, the State Water Board does not have information on the location of future projects. Changes in projects locations would not result in a net increase of GHG emissions because the proposed Procedures would not increase the amount of projects. Finally, there would be a relatively small number of projects that would be regulated differently under the proposed Procedures as compared to the existing regulatory framework, as described in Section 6, "Project Description." Accordingly the State Water Board determined that the effect on the proposed Procedures on GHG emissions would be less than significant.

The proposed Procedures would increase preservation of natural wetlands and aquatic resources. Existing GHG plans, projects, and regulations, where applicable, are typically triggered by projects that alter existing resources. Therefore, the proposed Procedures would have no significant impact on existing plans, projects, or regulations designed to reduce GHG emissions.

8.8 Hazards and Hazardous Materials

Although wetlands are responsible for a host of invaluable ecosystem services, these waters may also present hazards under specific circumstances. For example, significant concentrations of inorganic mercury are present in many of the soils and hydrologic systems in the state, and mercury is the most pervasive and problematic trace metal in the state's aquatic systems (Davis et al., 2007). In addition, as wetlands provide essential habitat for migratory bird species, these waters attract large bird populations. Proximity of a wetland area to an airstrip could present a bird strike hazard; the higher the concentration of birds in close proximity to an airfield, the higher the risk that a bird will strike an aircraft in a way that jeopardizes the lives of those onboard. Finally, the presence of wetland vegetation near urban areas may pose an increased risk of wildfire damage, especially if the wetland is unsaturated during the dry season and located in the arid southern regions of the state.

Methylmercury Exposure

Significant amounts of inorganic mercury have been released into the major water systems in the state, primarily into the Sacramento-San Joaquin Delta. The chief sources of inorganic mercury are mercury mining sites in the Coast Range, and gold mining operations in the Sierra Nevada and Klamath Mountains, which historically used mercury to enhance gold recovery (Alpers et al., 2005; Davis et al., 2007). After being released from historical mines, mercury travels in the form of surface water particulate matter, eventually settling throughout connected waterbodies. Mercury concentrations are highest in areas where historical mercury and gold mines were concentrated.

Once deposited in the surface sediments of waterbodies, sulfate- and iron-reducing bacteria process inorganic mercury compounds into methylmercury, a toxic compound that bioaccumulates in living species, posing serious health risks to humans from consumption of mercury-contaminated fish and game. The association of these formation processes within wetlands is well established (Lacerda and Fitzgerald, 2001). Habitats with the highest level of methylmercury production, concentration, and exposure to biota are those with periodic flooding periods separated by enough time for complete drying to occur (Gilmour et al., 2003; St. Louis et al., 2004; Alpers et al., 2008). As such, the wetlands most likely to present methylmercury hazards are those that are periodically flooded and dried as well as wetlands located in or downstream of areas populated by historical mines.

Wildlife Hazards to Aircraft

Wildlife hazard in this context refers to the risk of 'bird strikes' or collisions between birds and aircraft. Most bird strikes do not result in any aircraft damage, but some have led to serious accidents involving aircraft of all sizes. According to Bird Strike Committee USA (2012), collisions between aircraft and birds

and other wildlife result in over $600 million in damage to United States civil and military aviation each year.

The risk of such bird strikes are heightened in areas of high aircraft traffic located near habitats that attract birds, such as wetlands. As a consequence, the Federal Aviation Administration (FAA) requires that commercial airports comply with its wildlife hazard mitigation measures to minimize hazardous wildlife attractions in consultation with a wildlife damage management biologist, and otherwise follow FAA guidelines to reduce the risks. Additionally, since information about whether projects are located in close proximity to airports is not available, the potential for this risk would be determined at the individual project level on a case-by-case basis. As airport operators are already required to comply with FAA guidelines regarding wildlife hazards, the appropriate mitigation measures are already incorporated at most airports.[67]

Wildfire Hazards to Populated Areas

Wildfire risk is a potential hazard in many parts of California. The California Department of Forestry and Fire Protection (CDF) maps wildfire frequency and behavior statewide and has combined both analyses into a single assessment known as 'Fire Threat' (City of Roseville, 2005). Areas of high threat include large zones in Southern California, the central coast, lower elevations of the Sierra Nevada, and much of the northern interior of California. A significant amount of this fire threat is located near densely populated areas. Wetlands could contribute to wildfire risks under some circumstances, by providing fuel in the form of vegetation during dry periods.

Wildfire risk is influenced by the local terrain and climate conditions as well as the standing stock of vegetation that could provide fuel for wildfires during dry periods. As needed, the potential risk can be mitigated through fuel modification strategies consistent with local fire codes that protect populated areas from exposure to wildfires, along with other locally established best management practices.

Significance Determination

There are four categories for significance thresholds under hazards and hazardous materials, based on the nature of the categorical impacts: hazardous material exposure thresholds, wildlife hazard thresholds, wildfire risk thresholds, and response planning interference thresholds. Thresholds of significance are:

- An impact to hazardous materials exposure risks would be considered significant if the implementation of the Project would: a) result in the handling, storage, and treatment of hazardous materials, or b) provide for activities on or within 1,000 feet of a known contaminated site, or within 2,000 feet of a Superfund site;

[67] Additionally, on a case-by-case basis, proposed projects must comply with Public Resources Code section 21096, which requires that lead agencies utilize the Department of Transportation's Airport Land Use Planning Handbook to assist in the development of environmental impact reports.

- An impact to risk from bird strikes would be considered significant if the implementation of the Project presents any form of safety hazard to a nearby airport as specified in the FAA Code of Federal Regulations;
- An impact to risk from exposure to wildfire would be considered significant if the implementation of the Project prevents brush management requirements from being met;
- An impact to response planning interference would be considered significant if the implementation of the Project would substantially affect Police or Fire-Rescue response times.

Table 8-9 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-9. Hazards and Hazardous Materials Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials?	NI
b) Would the project create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?	NI
c) Would the project emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within ¼ mile of an existing or proposed school:	NI
d) Would the project be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code section 65962.5 and, as a result, would it create a significant hazard to the public or to the environment?	NI
e) and f) For a project located within an airport land use plan, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area. Or, for a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area?	LTS
f) Would the project impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?	NI

The State Water Board intends for the proposed Procedures to provide consistent identification of wetlands, and strengthen efforts to avoid and minimize impacts to wetlands, through evaluation of alternatives to identify and implement the LEDPA. This consistency may result in a greater effort to avoid wetland impacts and reduced discharge of dredged or fill materials potentially resulting in the protection and retention of a greater proportion of natural wetlands relative to existing policy.

Although wetland areas are potential sites of mercury methylation, the proposed Procedures would not create any additional mercury that is not already present in existing wetlands. Additionally, reducing the scale or frequency of discharge of dredged or fill materials in wetland areas could reduce mercury exposure resulting from the disturbance and erosion of potentially mercury-rich sediments. Overall, the proposed Procedures would not increase mercury concentrations or increase exposure compared to existing conditions.

Because the proposed Procedures is intended to provide consistent identification of wetlands, and strengthen efforts to avoid and minimize impacts to wetlands, and other waters of the state, the proposed Procedures would result in fewer opportunities for spills, leaks, discharges (i.e., oil and gas used for construction equipment), emissions or transportation accidents involving hazardous materials within aquatic resource areas.

An increase in alternative project sites associated with the proposed Procedures has the potential to shift projects or activities associated with hazardous materials to areas that may not have been developed in the absence of the proposed Procedures. Determining whether use of alternative sites would result in changes in risk from hazardous materials is impossible to predict. However, selection of the LEDPA, along with other relevant environmental regulations, would ensure the selection of sites with the least adverse environmental impacts. In addition, the State Water Board determined that the effect on hazardous materials would be less than significant.

The proposed Procedures would not increase existing wetland area nor result in additional compensatory mitigation sites given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, “Project Description.” The proposed Procedures would thus have no impact on development of alternative sites within five miles of any airport and pose no added danger to air traffic safety. Accordingly, staff determined potential impacts due to air safety issues to be less than significant.

The proposed Procedures would have no significant impact on implementation of an adopted emergency response plan or emergency evacuation plan because the proposed Procedures do not override the requirements for project developers to ensure projects do not interfere with these plans.

8.9 Hydrology and Water Quality

California is divided into nine Regional Water Quality Control Boards based on major watersheds. The State Water Resources Control Board and Regional Water Quality Control Boards (collectively, Water Boards), share the responsibility for protecting water resources in the state. In addition to those reviewed in Section 5.1, several other federal and state laws are designed specifically to protect the state’s hydrologic resources associated with streams and water quality, including:

- Section 10 of the Rivers and Harbors Act (33 U.S.C. 401 et seq.);

- Executive Order 11988—Floodplain Management (United States Department of Transportation Order 5650.2; 23 C.F.R. 650, Subpart A.);
- CDFW Code (§160o–1616 [Streambed Alteration]); and
- Cobey-Alquist Flood Plain Management Act (Wat. Code §8400 et seq.)

Surface waters include permanent, intermittent and ephemeral ponds, lakes, reservoirs, coastal estuaries and lagoons, and sloughs. Surface waters include human-made water features such as aqueducts, salt evaporating ponds, and improved flood control or drainage channels. Surface waters are important for water supply, irrigation waters, assimilative capacity, and flood control. These waters provide important habitat for fish and wildlife species, support wetland and riparian areas, provide direct pathways connecting to downstream ecological or human resources, and provide locations for groundwater recharge.

Groundwater is found in subsurface water-bearing formations. A groundwater basin is defined as a hydrogeologic unit containing one large aquifer or several connected and interrelated aquifers. Groundwater basins, which do not necessarily coincide with surface drainage basins, are defined by surface features and/or geological features such as faults, impermeable layers, and natural or artificial divides in the water table surface. The elevation of groundwater varies with the amount of withdrawal and the amount of recharge to the groundwater basin.

High water quality supports the designated water uses of a waterbody. Water quality in California is high in the largely unpopulated mountainous source areas but may be adversely affected as it reaches lower elevation where human activities and anthropogenic land uses occur. Land use affects surface water and groundwater quality. Both point and nonpoint source discharges contribute contaminants to surface waters. Pollutant sources in urban areas include parking lots and streets, rooftops, exposed earth at construction sites, and landscaped areas. Pollutant sources in rural/agricultural areas primarily include farming, ranching, forestry, and mining operations.

Contaminants in runoff waters may include sediment, hydrocarbons (e.g., fuels, solvents, etc.), metals,[68] pesticides, bacteria, nutrients, and trash. The impacts of pollutants on aquatic systems are many and varied. Polluted runoff waters can result in impacts on aquatic ecosystems, public use, human health (from ground and surface water contamination), damage to and destruction of wildlife habitat, decline in fisheries, and loss of recreational opportunities.

As a result of the proposed Procedures, potential adverse impacts on water quality may result from construction activity associated with building and compensatory mitigation activities (e.g., grading, which removes vegetation, exposing soil to wind and water erosion). A potential erosive condition occurs in areas with a combination of erosive soil types and steep slopes. Erosion can result in sedimentation that ultimately flows into surface waters. Small soil particles washed into streams can

[68] Including mercury.

clog fish gills and smother spawning grounds and marsh habitat. Suspended small soil particulates can restrict light penetration into water and limit photosynthesis of aquatic biota.

Based on the nature of the categorical impacts, significance thresholds can be divided into water quality significance thresholds, groundwater recharge significance thresholds, and hydrology significance thresholds, as follows.

- A water quality impact is significant if, relative to existing policy, implementation of the proposed Procedures would result in increased potential for exceeding numeric water quality standards or narrative objectives or violation of the state "anti-degradation" water quality policy (i.e., lead to a reduced capacity of the waterbody to support its designated uses);
- A groundwater impact is significant if, relative to existing policy, implementation of the proposed Procedures would result in depletion of groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table;
- A hydrological impact is significant if, relative to existing policy, implementation of the proposed Procedures would result in in alteration of the existing drainage patterns, cause significant flooding or erosional problems, or result in large volumes of polluted stormwater discharges;

Table 8-10 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-10. Hydrology and Water Quality Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project violate any water quality standards or waste discharge requirements?	NI
b) Would the project substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level?	LTS
c) Would the project substantially alter the existing drainage pattern of the site or area, resulting in increased sediment erosion and transport?	LTS
d) Would the project substantially alter the existing drainage pattern of the site or area, or substantially increase the rate or amount of surface runoff in a manner that would result in flooding on or off-site?	LTS
e) Would the project create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems?	NI
f) Would the project substantially degrade water quality?	NI
g) Would the project place housing within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate May or other flood hazard delineation map?	NI

h) Would the project place structures within 100-year flood hazard area which would impede or redirect flood flows?	NI
i) Would the project expose people or structures to a significant risk of loss, injury, or death involving flooding, including flooding as a result of the failure of a levee or dam, or by inundation by seiche, tsunami, or mudflow?	NI

The State Water Board intends for the proposed Procedures to provide consistent identification of wetlands, and strengthen efforts to avoid, minimize, and mitigate for impacts to wetlands and other waters of the state, through evaluation of an alternatives analysis to identify and implement the LEDPA. This consistency may result in a greater effort to avoid impacts to aquatic resources and reduced discharge of dredged or fill materials potentially resulting in the protection and retention of a greater proportion of aquatic resources relative to the existing regulatory framework. Additionally, the proposed Procedures would strengthen compensatory mitigation requirements. Accordingly, by reducing impacts to aquatic resources and strengthening compensatory mitigation requirements, the proposed Procedures would have no significant adverse impact on water quality, and would not violate any water quality standards or waste discharge requirements.

The proposed Procedures may result in the increased protection of natural streams and wetlands and is unlikely to deplete groundwater supplies or interfere substantially with groundwater recharge (i.e., result in a net deficit in aquifer volume or a lowering of the local groundwater table level). Some, but not all, types of aquatic resources can be important groundwater recharge areas and the hydrology of individual wetland or streams would need to be evaluated on a permit-specific level. Overall, since the protection of current aquatic resource areas would potentially increase, the proposed Procedures would unlikely deplete or interfere substantially with groundwater recharge, and the State Water Board determined the adverse impact to be less than significant.

The proposed Procedures have the potential to shift projects or activities associated with hazardous materials to upland areas away from wetlands and other waters of the state. Alternative project sites could cause alterations of existing drainage patterns of the alternative sites or affect the rate or amount of surface runoff in a manner that could result in flooding on or off-site. Alternative project sites could also create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems. However, the State Water Board does not have information on the location of future projects or the effect of upland project locations on local drainage.

In these cases, selection of the LEDPA, along with other relevant environmental regulations, would ensure the site is selected with the least adverse environmental damage. Accordingly, the State Water Board determined that the effect on the proposed Procedures on altered drainage or runoff would be less than significant. Natural wetlands tend to act as sinks not sources of stormwater and tend to provide purification services relative to water quality. Natural wetlands can act as effective retention reservoirs for storing flood volumes for more gradual release to downstream areas. Therefore, retention

of natural wetlands would not create or contribute runoff waters that would exceed the capacity of stormwater drainage systems. Accordingly, staff determined that this impact would not be significant.

Water quality degradation happens in several forms, but generally is the result of individual finite impacts that do not, alone, constitute water quality standards violations, but which cumulatively lead to a significant reduction in the inherent properties of the waterbody or ability to support designated beneficial uses including reduction in assimilative capacity, reduction in biodiversity, or degraded water quality (e.g., more water treatment need to produce potable water). The protection and retention of current aquatic resources, at the watershed level, would avoid possible degradation of existing water quality. Overall, the proposed Procedures would have no significant impact on water quality degradation or changes to water uses.

The proposed Procedures would likely deter the placement of housing or structures within a 100-year flood hazard area. Therefore the proposed Procedures would not have an impact on 100-year flood hazard area. The proposed Procedures would also not expose people or structures to risk of loss, injury or death involving flooding or by inundation by seiche, tsunami, or mudflow. Accordingly, staff determined that these impacts would not be significant.

8.10 Land Use and Planning

The proposed Procedures would be implemented within the existing framework of regulations surrounding land use. Some of the relevant federal, state, and local regulations that pertain to land use in California are:

- Coastal Zone Management Act (16 USC §1451-1465);
- California Farmland Protection and Plan Act (Title 440, Part 523);
- California Land Conservation Act (Williamson Act; CA §51220 et seq.);
- Natural Community Conservation Planning Act (Fish & G. Code, §2800 et seq.); and
- Government Code, Title 7, Planning and Land Use (§65000 et seq.).

In California, the majority of land use planning is done at the local level, since local or regional agencies have primary responsibility for land use control and regulation within their areas of jurisdiction. State planning and zoning law requires all counties and incorporated cities in the state to prepare, adopt, and implement a comprehensive general plan to guide the community's growth and development. Under state planning law, a general plan must contain seven elements: land use, open space, transportation/circulation, housing, safety, noise, and conservation.

A general plan may also include optional elements at the discretion of the local agency, such as an agricultural element or a recreation element. Water resource and use issues are typically addressed in a general plan in terms of natural resource values as well as an essential requirement for land use and development. The general plan is commonly implemented through zoning and other local land use and development ordinances, which must be consistent with the general plan.

In reviewing and making decisions on applications for various land use development projects, the local agency must typically produce findings that the proposed activity (e.g., a conditional use permit or a subdivision of real property) is consistent with its general plan. If the decision is discretionary and the project could have an effect on the physical environment, then the county or city must comply with the procedural and documentation requirements of CEQA (California Department of Conservation, 2007).

Table 8-11 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-11. Land Use and Planning Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project physically divide an established community?	NI
b) Would the project conflict with any applicable land use plan, project, or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?	NI
c) Would the project conflict with any applicable habitat conservation plan or natural community conservation plan?	NI

As discussed in Section 6, "Project Description," the proposed Procedures would potentially lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. As a consequence of the adoption of the proposed Procedures more of the natural landscape associated with aquatic resources would be undisturbed and as such, there would be less potential for impact to existing land use planning regulations.

The proposed Procedures could shift development to upland areas away from aquatic resources. However, the State Water Board does not have information on the location of future projects or the potential for land use planning conflicts. The proposed Procedures and clarification of wetland status should support – rather than conflict with – any applicable HCP or NCCP. The proposed Procedures encourage the watershed approach and incentivize compliance with watershed plans approved by the Water Boards, which would potentially include HCPs and NCCPs. In many cases, project proponents would consider potential impacts to land use planning under the CEQA process. Further, the clarification of wetland status should improve planning accuracy and resolve planning issues. In addition, given the relatively small number of projects that would be regulated differently under the proposed Procedures, compared to the existing regulatory framework as described in Section 6, "Project Description," the State Water Board determined that the effect of the proposed Procedures on land use planning would be less than significant.

As the proposed Procedures would likely result in the increased preservation and maintenance of existing waters of the state, including wetlands, there should be decreased conflict with land use plans,

projects, or regulations, especially since watershed plans, including HCPs and NCCPs, and local general plans should have been designed to avoid or mitigate environmental impacts. As a result, the proposed Procedures would have no impact on HCPs or NCCPs.

8.11 Mineral Resources

California ranked seventh in the nation in the value of non-fuel mineral production in 2011, accounting for about 3.9 percent of the nation's total (Clinkenbeard and Smith, 2011). The state produced more than two dozen different non-fuel mineral commodities, such as diatomite, natural sodium sulfate, boron compounds, cement, gold, silver, clay, feldspar, fuller's earth, gemstones, gypsum, iron ore, kaolin clay, lime, magnesium compounds, pumice, salt, soda ash, and zeolites (Clinkenbeard and Smith, 2011).

Table 8-12 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-12. Mineral Resources Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project result in the loss of availability of a known mineral resource that would be of future value to the region and residents of the state?	LTS
b) Would the project result in the loss of availability of a locally-important mineral resource recovery site delineated on a local general plan, specific plan, or other land use plan?	LTS

As discussed in Section 6, "Project Description," the proposed Procedures would potentially lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. As a consequence of the adoption of the proposed Procedures more of the aquatic resource areas would be undisturbed compared to the existing regulatory framework.

However, by avoiding impacts to aquatic resources, the proposed Procedures could shift development to upland areas away from wetlands and other waters of the state. It is possible that this effect could restrict access to a known mineral resource that would be of future value to the region and residents of the state, or a locally-important mineral resource recovery site delineated on a local general plan or other land use plan. However, the State Water Board does not have information on the location of future mining projects or their potential environmental impacts.

In these cases, selection of the LEDPA, along with other relevant environmental regulations, would avoid selection of sites with adverse alternatives. In addition, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description," the State Water Board determined that the effect on the proposed Procedures on hazardous materials would be less than significant.

8.12 Noise

The CEQA Guidelines require evaluation of the significance of environmental noise impacts attributable to a project. The purpose of the noise assessment is to identify, describe, and evaluate sources of noise and potential land use conflicts related to environmental noise, beginning with a characterization of the baseline noise conditions and surrounding existing sensitive land uses. A noise assessment provides evaluation of potential changes in noise levels or noise exposure circumstances caused by the proposed project. A significant noise impact would be identified if a project results in generation or exposure of people to noise levels in excess of standards, excessive ground-borne vibration or noise, or substantial temporary, periodic or permanent increases in ambient noise levels. Additional impacts are involved if a project would create excessive noise levels within an airport land use plan or in the vicinity of a public airport or private airstrip.

Table 8-13 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-13. Noise Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project result in exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?	LTS
b) Would the project result in exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels?	LTS
c) Would the project result in a substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project?	LTS
d) Would the project result in a substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?	LTS
e) For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels?	LTS
f) For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels?	LTS

As discussed in Section 6, "Project Description," the proposed Procedures would potentially lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. As a consequence of the adoption of the proposed Procedures more of the aquatic resource areas would be undisturbed and as such, there would be less potential for generation of noise from future development in these areas.

The proposed Procedures could shift development to upland areas away from wetlands and other waters of the state or could cause them to relocate to a location within an airport land use plan or within two miles of a public airport or public use airport. However, the State Water Board does not have information on the location of future projects. In many cases, project proponents will consider potential noise impacts during the CEQA process for individual projects that would be regulated under the proposed Procedures.

Further, given the relatively small number of projects that would be regulated under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description", the State Water Board determined that the effect of the proposed Procedures on noise impacts would be less than significant.

8.13 Population and Housing

CEQA Guidelines indicate that SEDs should address social and economic effects only to the extent that these effects create adverse impacts on the physical environment.[69] The proposed Procedures could result in a shift in housing projects to upland areas where they wouldn't impact aquatic resources. There could be more project activity and thus more selection of LEDPA sites in areas of the state with higher population growth. The California Department of Finance (2013) projects some counties to have greater than one million people by 2060, while other counties may increase by greater than 100% between 2010 and 2060 (Table 8-14; Figure 20). The California Department of Finance (2013) projects that the population will exceed 50 million in 2049, and that about 62%, or about 32 million people, will be in eight southern California counties in 2060 (Table 8-14; Figure 20).

The California Department of Finance (2013) projections indicate that the highest growth rates will occur in the Central Valley (specifically in the greater Sacramento region), portions of the Northern Sacramento Valley, and the San Joaquin Valley, as well as in the Southern California and the southern border. The projections also indicate that much of the state's population in 2060 will be in Southern California. Due to high growth and large numbers of people, the potential environmental impacts associated with identifying alternative project sites could be the greatest in these areas.

Table 8-14: California County Growth Projections[70]

Projection	**Counties**
2060 population > 62% of state population	Imperial, Kern, Los Angeles, Orange, Riverside, San Bernadino, San Diego, Ventura
2060 population > 1 million people	Alameda, Contra Costa, Fresno, Sacramento, San Joaquin,

[69] Note that residential planning is linked to land use planning, which is evaluated separately in Section 4.3.3.
[70] Source: California Department of Finance (2013)

	Santa Clara
2060 population > 2 million people	Kern, Orange, Los Angeles, Riverside, Sacramento, Santa Clara, San Bernadino, San Diego
2010 – 2016 growth > 50%	Butte, Colusa, Contra Costa, El Dorado, Fresno, Kings, Lake, Nevada, Placer, San Benito, San Bernardino, Riverside, Sacramento, Solano, Stanislaus, Tehama, Tulare, Yolo
2010 – 2060 growth > 100%	Imperial, Kern, Madera, Merced, San Joaquin, Sutter, Yuba

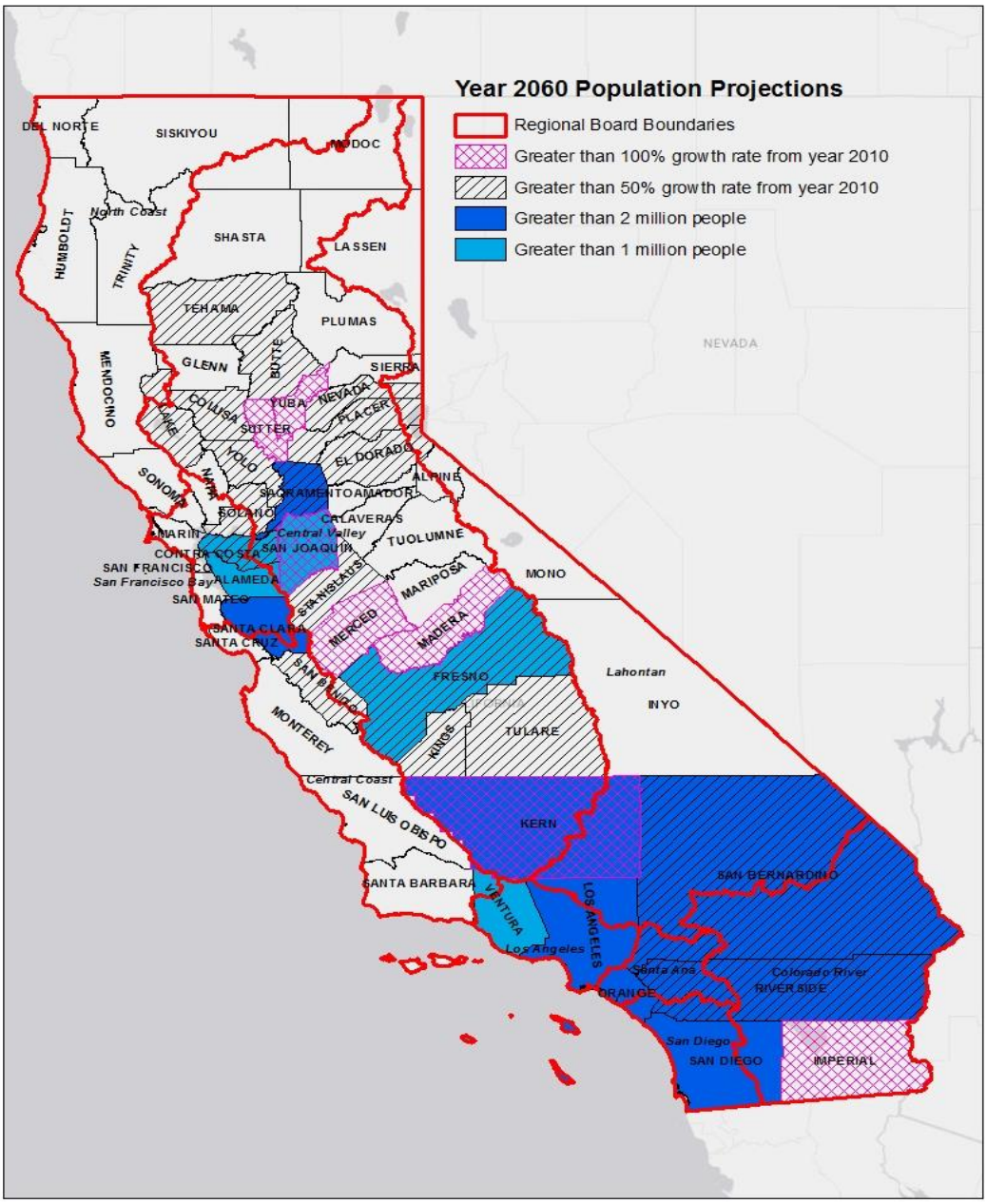


Figure 20: Year 2060 Population Projections (California Department of Finance, 2013)

However, housing would likely occur within the same general area of the original proposed project location. The proposed Procedures would not induce substantial population growth in an area, but rather shift the location of future projects that would have occurred regardless of the proposed Procedures to avoid and minimize impacts to aquatic resources. The proposed Procedures would also

not create a demand for additional housing, or displace any existing housing units or persons. Therefore, the proposed Procedures would have no impact on population growth or housing demand.

Table 8-15 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-15. Population and Housing Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project induce substantial population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?	NI
b) Would the project displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere?	NI
c) Would the project displace substantial numbers of people, necessitating the construction of replacement housing elsewhere.	NI

As discussed in Section 6, "Project Description", the proposed Procedures would potentially lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. As a consequence of the adoption of the proposed Procedures, more of the aquatic resource areas would be undisturbed, but this would not affect population growth and housing other than the potential shift of the location of these impacts as mentioned above.

The proposed Procedures could shift development to upland areas away from aquatic resource areas. However, the State Water Board does not have information on the location of future projects. In many cases, project proponents will consider potential impacts due to population and housing during the CEQA process.

Further, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description"**Error! Reference source not found.**, the State Water Board determined that the effect of the proposed Procedures on population and growth would not have an impact.

8.14 Public Health and Vector Control

Although potential biological vectors (i.e., animal species capable of acting as reservoirs and transmitting agents of human diseases) include ticks, fleas, and small mammals, the primary public health issue associated with the proposed Procedures is mosquito vectors. The proposed Procedures affect jurisdictional protection of waters of the state, including wetlands. Intact wetlands are often a preferred breeding habitat for mosquito vector species, and therefore policies that affect the quantity, location, and type of wetlands in the state will potentially have implications for mosquito populations and potential human exposure risk to mosquito-borne diseases.

Local vector control agencies survey breeding habitat and observe changes in population size, disease risk, and public nuisance levels to assess local risks. Some of the major diseases of concern in California include West Nile virus, St. Louis encephalitis, western equine encephalomyelitis, California encephalitis, and malaria (Kwasny et al., 2004). Mosquito abatement typically relies on an integrated pest management approach, combining pesticides, biological controls such as mosquitofish (*Gambusia* spp.), and habitat reductions through activities such as draining wetlands and others. In more remote, sparsely populated areas, authorities may elect not to control mosquitos directly, relying only on signs and barriers to prevent people from coming into contact with breeding areas.

Vector control agencies' actions are governed by federal laws, including the CWA, ESA, and Federal Fungicide and Rodenticide Act, as well as state law under the Health and Safety Code (§2000 et seq., §106925, §16100-116250) and other state regulations governing pesticides. Pesticide applications may adversely affect water quality, although application of pesticides in strict accordance with state and federal regulations should minimize these impacts. Discharges of pesticides and pesticide residues are required to meet criteria under the California Toxics Rule as well as water quality criteria designed by the Water Boards to protect beneficial uses of waters. The most protective appropriate criteria are applied in order to protect all designated uses of the receiving water.

Recently, the Sixth Circuit Court ruled that the application of pesticides at, near, or over waters of the United States that results in discharges of pollutants requires coverage under a NPDES permit. In response to the Sixth Circuit Court's decisions and previous decisions by other courts on pesticide regulation, the State Water Board has adopted four pesticide permits for various applications of pesticides at, near, or over waters of the United States that enforce water quality standards. All pesticides used for vector control must be registered for use in California, must be applied by a certified technician or someone working under the direct supervision of a certified technician, and must be applied in accordance with the pesticide product's registered label.

All species of mosquito require standing water for breeding and larval development. Female mosquitos lay batches of eggs, which hatch in the water, undergoing four aquatic larval stages and an aquatic pupal stage before developing into aerial adults (Kwasny et al., 2004). Species that are most of concern, as vectors prefer stagnant water, can be found in many types of wetlands. Any waters that remain undisturbed for more than three to five days are considered potential mosquito breeding habitats (California Bay-Delta Authority (CALFED), 2000). Although mosquitos breed year round in some parts of California, peak breeding occurs during the warmer months from mid-spring and mid-autumn.

Individual natural wetlands may or may not contain mosquito breeding habitat, requiring identification of such habitats on a site-specific basis. In some cases, natural wetland habitat could require mosquito abatement activities (including pesticide applications) in some areas in order to ensure that human populations are not at risk from vector-borne diseases. However, a large number of mosquito mitigating measures are currently utilized by local mosquito control authorities. Local vector control agencies have broad authority to manage and abate mosquito breeding habitats to ensure they do not become a

nuisance. For example, potential mitigation measures to reduce or control mosquito breeding habitat include (California Division of Health Services, 2005):

- Site maintenance and frequent site inspections;
- Netting over target areas;
- Constructing and maintaining appropriate drainage slopes;
- Encouraging mosquitofish (*Gambusia* spp.) and other mosquito predators, including invertebrates (e.g. water boatmen and dragonfly larvae), birds (e.g., swallows), and bats, among others;
- Vegetation management to ensure adequate predator access to mosquitos;
- Open water marsh management, which connects marshes to a canal or pond using a system of ditches to enable water flow and allow aquatic predators into marshes; and
- Application of pesticides (e.g., methoprene) or biological control agents (e.g., the bacterium *Bacillus thuringiensis*).

A public health and vector control impact is significant if, relative to existing policy, implementation of the Project would result in:

- An increase in the potential exposure of the public to disease vectors; or
- An increase in potential mosquito/vector breeding habitat.

Table 8-16 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-16. Public Health and Vector Control Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project increase the potential exposure of the public to disease vectors (i.e., mosquitos, ticks, and rats)?	LTS
b) Would the project increase potential mosquito/vector breeding habitat (i.e., areas of prolonged standing/ponded water like wetlands or stormwater treatment control BMPs)?	LTS

The proposed Procedures provide consistent identification of wetlands and strengthens efforts to avoid, minimize, and mitigate for impacts to wetlands, through evaluation of alternatives to identify and implement the LEDPA. This consistency may result in a greater effort to avoid wetland impacts and reduced discharge of dredged or fill materials potentially resulting in the protection and retention of a greater proportion of natural wetlands relative to the existing regulatory framework.

Risk of human exposure to disease through vectors is a complex function affected by the quantity of mosquito breeding habitat, concentrations of mosquito populations, presence of infectious disease in the mosquito population, seasonal climactic factors, and the proximity of mosquito breeding sites to human populations. The proposed Procedures would not change current wetland areas or locations.

Since the area of mosquito breeding habitat and its location relative to human populations would not be affected, there should be not any increase in the mosquito population or risk to humans.

The proposed Procedures have the potential to shift projects or activities to upland areas away from wetlands. The State Water Board does not have information on the location of future projects.

Further, selection of the LEDPA, along with other relevant environmental regulations, would avoid selection of sites with increased human risks. In addition, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description," the State Water Board determined that the effect on the proposed Procedures on public heath vectors would be less than significant.

8.15 Public Services

The Public Services section assesses the impact of a project on law enforcement, fire protection, schools, and other public services. Staff assessed whether a project would result in substantial adverse physical impacts or alteration of governmental facilities needed to maintain acceptable service ratios, response times, education metrics, or other performance objectives for any of the public services. Analysis of impacts on relative police and fire protection could consider facilities and equipment, fire flows, emergency response, and emergency access.[71]

A project would have an effect on public services if it would result in substantial adverse physical impacts associated with the creation of new or physically altered governmental facilities, or a need for new or physically altered governmental facilities in order to maintain acceptable service ratios, response times, or other performance objectives. Altered or increased school services would likely be a secondary effect of housing and population which has been found above to be of no significance.

Table 8-17 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-17. Public Services Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:	NI
i. Fire protection?	NI

[71] Wildland fire hazards are considered separately under Hazards and Hazardous Materials in Section 4.3.3.

ii.	**Police protection?**	NI
iii.	**Schools?**	NI
iv.	**Parks?**	NI
v.	**Other public facilities?**	NI

As discussed in Section 6, "Project Description," the proposed Procedures would potentially lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. More aquatic resource areas would be undisturbed and as such, there would be less potential for impact to public services related to aquatic resources.

The proposed Procedures would not impose a substantially greater demand for public services beyond that which already exists. The proposed Procedures would not result in a need for altered or new facilities to provide law enforcement, fire protection services, or required additional educational services. Review of the potential categorical impacts listed under this category indicates there would be no significant impact.

8.16 Recreation

Because of the importance of recreational resources to quality of life, CEQA requires consideration of environmental effects on parks, recreation, and open space, including any environmental consequences that would likely result from a project. Of particular concern is whether the project would result in either (1) increased use of and/or possible deterioration of existing neighborhood or regional parks or (2) lead to conditions that might lead to a need for construction of new parks or expansion of existing parkland.

Table 8-18 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-18. Recreation Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated?	LTS
b) Would the project include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment?	NI

As discussed in Section 6, "Project Description," the proposed Procedures would potentially lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. As a consequence of the adoption of the proposed Procedures more of the aquatic resource areas would be undisturbed and as such, there would be less potential for impact to recreational areas associated with aquatic resources. In general, recreational resources should benefit from protection of wetlands, steams, wildlife habitat, open space, improved water quality, increased flood protection, and increased fish and waterfowl populations.

The proposed Procedures could shift development to upland areas away from wetlands. However, the State Water Board does not have information on the location of future projects or possible related change to the use of existing neighborhood and regional parks or other recreational facilities. In many cases, project proponents will consider potential impacts to recreation during the CEQA process.

Further, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description," the State Water Board determined that the effect of the proposed Procedures on recreation would be either be less than significant or have no impact.

8.17 Transportation/Traffic

CEQA review requires consideration of the potential impact of a project on existing and projected transportation and circulation conditions. This consideration includes:

- *Direct traffic impacts*, which are those projected to occur at the time a proposed development becomes operational, including other developments not presently operational but which are anticipated to be operational at that time (near term); and
- *Cumulative traffic impacts*, which are those projected to occur at some point after a proposed development becomes operational, such as during subsequent phases of a project and when additional proposed developments in the area become operational (short-term cumulative) or when the affected community plan area reaches full planned build out (long-term cumulative).

Table 8-19 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-19. Transportation/Traffic Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to	LTS

intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?	
b) Would the project conflict with an applicable congestion management program, including, but not limited to level of service standards and travel demand measures or other standards established by the county congestion management agency for designated roads or highways?	LTS
c) Would the project result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks?	LTS
d) Would the project substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?	LTS
e) Would the project result in inadequate emergency access?	LTS
f) Would the project conflict with adopted policies, plans, or programs supporting alternative transportation (e.g., bus turnouts, bicycle racks)?	LTS

As discussed in Section 6, "Project Description," the proposed Procedures would potentially lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. More aquatic resources would be undisturbed.

The proposed Procedures could shift development to upland areas away from aquatic resources. The proposed Procedures, either through the retention of aquatic resources or the movement of projects to upland locations, could potentially affect the design of roads or conflict with plans that establish measures of effectiveness for the performance of traffic circulation systems, traffic congestion management programs, or plans that support alternative transportation. However, the State Water Board does not have information on the location of future projects. In many cases, project proponents will consider potential impacts to transportation during the CEQA process. In addition, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description," the State Water Board determined that the effect on the proposed Procedures on transportation and traffic would be less than significant.

8.18 Utilities and Service Systems

CEQA requires assessment of the impact of a project on general utilities such as water supply and wastewater, solid waste disposal, electricity, natural gas, solar power, telecommunications, and other relevant service systems such as stormwater management. A project would have an effect on utility systems if it would affect potable water, wastewater treatment, stormwater, or solid waste facilities either directly (via new or expanded facilities) or indirectly (via a new generation source, and/or demand that would exceed the capacities of existing facilities). Each utility provider generally establishes its own

threshold criteria for utility capacity and service expansion. Utility providers are typically a combination of municipal, quasi-public agencies, and privately owned companies and corporations.

The proposed Procedures would not result in a greater amount of residential projects requiring public service in the state, but rather could result in the relocation of the projects to alternative sites. Implementation of the proposed Procedures would not change wastewater treatment requirements, require new or expansion of wastewater treatment facilities, require new or expansion of stormwater drainage facilities or affect local solid waste disposal services. The proposed Project would not cause a net exceedance of wastewater treatment facilities, stormwater treatment, or landfills or create a net increase of water use. The proposed Procedures would not affect how projects comply with federal, state, and local statues and regulations related to solid waste.

Table 8-20 lists the potential categorical impacts and provides staff's determinations of significance.

Table 8-20. Utilities and Service Systems Categorical Impacts and Significance Determinations

Impact Questions	**Significance Determination**
a) Would the project exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?	LTS
b) Would the project require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	LTS
c) Would the project require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?	LTS
d) Would the project have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?	LTS
e) Would the project result in a determination by the wastewater treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?	LTS
f) Would the project be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs?	NI
g) Would the project comply with federal, state, and local statutes and regulations related to solid waste?	NI

As discussed in Section 6, "Project Description," the proposed Procedures would potentially lead to less alteration, filling, or dredging of wetlands and other waters of the state that are not under federal jurisdiction. As a consequence of the adoption of the proposed Procedures more of the aquatic resource areas would be undisturbed and thus would not affect utilities and service systems in those areas, other than to shift the location of the potential effects.

The proposed Procedures could shift development of public services to upland areas away from wetlands and other waters of the state. However, the State Water Board does not have information on the location of future projects. In many cases, project proponents will consider potential impacts to public services during the CEQA process.

Further, given the relatively small number of projects that would be regulated differently under the proposed Procedures compared to the existing regulatory framework, as described in Section 6, "Project Description," the State Water Board determined that the effect of the proposed Procedures on public service would be either be less than significant or have no impact.

9. CUMULATIVE IMPACTS

The term "cumulative impacts" refers to two or more individual effects which, when considered together, are significant or which compound or increase other environmental impacts. This section describes the potentially cumulatively considerable[72] impacts of individual effects arising from the Project, as well as those arising from the Project in combination with past, present, and reasonably foreseeable future projects.

9.1 Cumulative Impacts from Two or More Individual Effects

The proposed Procedures would not allow Water Boards to approve projects that have cumulative impacts based upon past or reasonably anticipated future impacts that could cause a violation of downstream water quality standards, violate regional air quality objectives, or other appropriate requirements of state law. As documented in Section 0, the State Water Board has determined that there would be no potentially significant adverse effects arising from the proposed Procedures. As such, the proposed Procedures would not result in any cumulatively considerable impacts arising from two or more individual effects.

9.2 Past, Present, and Reasonably Foreseeable Future Projects

The cumulative impacts from several projects is the change in the environment which results from the incremental impact of the Project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time.

Relevant past projects include the key historical wetland protection initiatives in California, as summarized in Section 5.45, "Project Background." Specifically, the proposed Procedures expands the use of watershed plans to review and approve dredged or fill projects. The proposed Procedures would allow Water Boards to condition dredged or fill projects differently that are in compliance with applicable watershed and regional plans or, in their absence, with other relevant environmental plans such as HCPs or NCCPs approved by the Water Boards. Future projects may also be relevant, but are often hard to predict precisely. As such, this section provides a discussion of the potential for cumulatively considerable impacts arising from the proposed Procedures in combination with past projects only.

Taken together, past initiatives in the state (including provisions in the CA Water Code) and the proposed Procedures collectively protect waters of the state, including those that are not currently subject to CWA protections. As such, they have cumulatively considerable impacts with regard to the

[72] "Cumulatively considerable" means that the incremental effects of an individual project are significant when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects (14 CCR §15065(a)(3)).

protection afforded to these waters throughout California. Specifically, they apply protections to waters of the state, including wetlands that may otherwise be subject to unregulated dredged or fill projects.

The CEQA Guidelines state that:

> The mere existence of significant cumulative impacts caused by other projects alone shall not constitute substantial evidence that the proposed project's incremental effects are cumulatively considerable (14 CCR §15065(a)(3)).

Therefore, the State Water Board considered whether the impacts of the proposed Procedures are cumulatively considerable within the context of and relative to impacts caused by other past, present, or future projects that protect wetlands in California.

The proposed Procedures would supplement, clarify, and support the wetland protections that arise from earlier statewide projects, particularly as implemented under the CA Water Code. Compared to existing policies, the proposed Procedures would add consistency and transparency to the determination of wetland areas and help resolve uncertainties regarding wetland identification in areas of overlapping regulatory jurisdiction. The proposed Procedures would also provide certainty for permit applicants regarding the requirement to evaluate project alternatives and select the LEDPA.

As discussed in Section 6, "Project Description," a small portion of projects that discharges to waters of the state, including wetlands, may be impacted by the requirements of the proposed Procedures, and the State Water Board anticipates that only a subset would result in project design changes to avoid wetland impacts. The proposed Procedures would clarify and supplement existing regulations, including the CA Water Code, that are intended to protect all waters of the state, including wetlands. Additionally, implementation would be consistent with all applicable regional or local plans regarding conservation or land use.

Compared with the more comprehensive protection provisions in the existing CA Water Code, the share of incremental protection for waters of the state, including wetlands, attributable to the proposed Procedures would be minimal. As such, the proposed Procedures would not result in any cumulatively considerable impacts when combined with other past, present, or reasonably foreseeable related projects.

10. ISSUES AND PROCEDURES ALTERNATIVES

This section describes a reasonable range of potentially feasible alternatives that might attain the basic objectives of the proposed Procedures (as discussed in Section 6, "Project Description"). According to CEQA Guidelines, economic, social, and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce or avoid the significant effects on the environment. As discussed in Section 8, "Environmental Impacts," the proposed Procedures will not have any significant effects. Nonetheless, the State Water Board considered a variety of alternatives that might attain the objectives of the proposed Procedures. The State Water Board based the alternatives primarily on stakeholder input.

10.1 Issue: Applicability of Procedures

Resolution 2008-0026, adopted by the State Water Board on April 15, 2008, is the main directive for the proposed Procedures. It directs the State Water Board staff to "establish a policy to protect wetlands from dredged or fill activities." The proposed Procedures address concerns including the limited protection of waters not under federal jurisdiction, inconsistent wetland identification across the Water Boards, and the failure of compensatory mitigation to adequately protect the quantity and quality of wetlands in California (see Section 6 "Project Description").

No-Project Alternative: Do Not Adopt Procedures

Under the No-Project alternative, existing relevant regulations, policies, and plans would continue without the proposed Procedures. The existing regulatory framework includes reasonably foreseeable modifications and new plans, policies, and regulations that the Water Boards are currently considering for adoption or are required to adopt. The Water Boards would continue the current program of protecting wetlands and regulating dredged or fill discharges to state waters.

The current program, however, has a number of major deficiencies (see Section 6, "Project Description"). There would continue to be a lack of regulatory consistency in the review and approval of applications for discharges of dredged or fill materials. There would not be consistent requirements for avoidance and minimization of impacts to waters, increasing (relative to the proposed Procedures) the chances of greater project-level impacts aquatic resources. There would not be a standard wetland definition and delineation method across Water Boards, potentially causing regulatory uncertainty over identifying wetlands and their extent, thereby increasing the chances of adverse impacts to wetlands. There would also not be a comprehensive Water Board framework for permitting compensatory mitigation, which would likely result in inconsistent mitigation requirements statewide.

Therefore, continuing current California Water Board regulatory practices under the No-Project alternative would not meet project objectives, and is likely to result in greater impacts to aquatic resources.

Adopt Procedures for Non-federal Waters ("Gap") Only

In 2001 and 2006, the U.S. Supreme Court made decisions that have had the effect of restricting the meaning of "waters of the United States," and thereby reducing the extent of federal CWA jurisdiction. This reduction has caused what is referred to as a "gap" between those waters subject to federal jurisdiction and those that are not. The State Water Board could apply the proposed Procedures to these non-federal (gap) waters only.

Under this alternative, there would be only changes to existing state permitting requirements for discharges of dredged or fill material to non-federal waters. As discussed in Section 6 "Project Description," this is a very small share of permits, or about 1% of those issued by Water Boards.

However, this option would result in two different "rulebooks" for permitting discharges of dredge or fill – one for CWA section 401 certifications, and one for discharges of dredged or fill material to non-federal waters. This would not meet the objective of establishing a uniform regulatory approach for the discharge of dredged or fill material into waters of the state, including wetland areas. Administering two programs is also inefficient.

Therefore, applying the proposed Procedures only to non-federal (gap) waters contributes to regulatory uncertainty, is likely to result in greater impacts to wetland resources by not addressing protection of federally jurisdictional wetlands and other waters, and contributes to higher program costs.

Administer CWA Section 404 Program for All State Waters

Under this alternative, the Water Boards would take responsibility for administering the CWA section 404 permitting program from the Corps, thereby eliminating duplication between state and federal permitting programs. Section 404 permit applicants would need only a state permit for dredged or fill discharges into waters subject to federal jurisdiction, which includes most wetlands. However, the Corps would continue to regulate navigable waters (including tidal waters and their adjacent wetlands) under section 10 of the Rivers and Harbors Act of 1899.

In order to assume administration of the section 404 program, the Water Boards would need to develop a permit program similar to the federal Corps program, and successfully submit an application to USEPA to assume the program. Such a program must provide at least the same level of protection, regulation, enforcement and public participation as the current CWA section 404 program. State regulations can provide greater resource protection, but cannot be less stringent than federal regulations. Under this alternative, Water Board staff would take over the work and responsibilities currently being performed by Corps staff, such as verification of wetland delineations. The Water Boards would determine what areas and activities are regulated for discharges of dredged or fill material, process permits, and carry out enforcement activities.

USEPA has responsibility for oversight of state-assumed CWA section 404 programs (see 40 CFR Part 233). USEPA typically waives review of most permit applications, but is required to review applications for projects with the potential to impact critical resource areas such as wetlands that support federally listed species, sites listed under the National Historical Preservation Act, components of the National

Wild and Scenic River System, and similar areas. USEPA in turn is required to coordinate with other federal agencies (the Corps, USFWS, and the National Marine Fisheries Service).

However, this alternative is not viable because (1) the significant administrative costs to the state would outweigh the benefits of a state only dredged or fill regulatory program and (2) a state program would need to address the additional complexities of meeting federal requirements for dredged or fill discharges and complying with federal oversight. Citing similar challenges, most other states have also declined to pursue assumption of the federal CWA section 404 program.[73] Only two states, Michigan and New Jersey, have assumed the federal CWA section 404 program, although some states are working towards it or have pursued cooperative permit programs.

Adopt Uniform Procedures for All State Waters

This alternative consists of adopting a single set of procedures that apply to all waters of the state, including those that are under federal jurisdiction (subject to CWA section 404 requirements) and those that are not (subject to California WDR requirements only). The proposed Procedures (as described in Section 6, 'Project Description") meet project objectives, and are consistent with this alternative.

10.2 Issue: Wetlands Definition

Wetland definitions generally include one or more of three related factors (parameters): hydrology, hydric soils, and hydrophytic vegetation. Hydrology is recognized as the "master" factor as it allows for the development of the dependent factors of hydric soils and hydrophytic vegetation that are characteristic of wetland areas. The Corps' definition of wetlands, along with its guidance documents, is an example of a "three-parameter approach" because all three factors are included in the definition.

As discussed in more detail in Section 5, "Project Background," the definition of wetlands differs across the Water Boards. The Water Boards frequently rely on the Corps' wetland definition when reviewing applications for section 401 certifications. Some Regional Water Boards have adopted the federal wetland area definition and delineation methods, but others have not. As such, there is need for a single wetland definition across all Water Boards that can be applied consistently statewide in the regulatory and monitoring programs.

Do Not Define Wetlands

Using this approach, the State Water Board would not include a definition of wetlands within the proposed Procedures, and would instead rely only on existing definitions by the Regional Water Boards. Under this approach, there would continue to be inconsistency by the Water Boards with regards to the identification of wetlands. When applications include wetland areas, this inconsistency would lead to confusion in locating wetland boundaries for the purposes of avoidance, minimization, and mitigation. In

[73] see http://aswm.org/wetland-programs/s-404-assumption for further information.

the absence of a Water Board-specific wetland definition, members of the regulated community often assume that state waters, including wetlands, are defined and similarly identified as those under federal jurisdiction.

Because of the inconsistencies, uncertainty, and inefficiencies associated with the current absence of a Water Board wetland definition, the State Water Board has rejected this option.

Define all wetlands as waters of the state

This alternative would provide a clear jurisdictional definition for all wetlands. Depending on the definition, however, it would likely be either too inclusive, or not inclusive enough, compared to the status quo. At this point in time, it is not possible to provide clear categories of features, all of which are either waters of the state, or not waters of the state. For these reasons, the State Water Board has rejected this alternative.

Apply a One-Criterion Test

The State Water Board considered adopting a wetland definition based on any one-of-three approach. For example, under the USFWS wetland definition, a positive indicator of any one of the factors of wetland hydrology, hydric soils, or hydrophytic vegetation is considered sufficient to make a wetland determination (Cowardin et al., 1979).

Under this type of definition, wetland identification relies on identification of individual wetland characteristics rather than a combination of multiple characteristics. This is more inclusive than the three-of-three approach used by the Corps since more areas would qualify as wetland areas based on exhibiting the most extensive of one or more factors.

One consequence of this increased inclusivity is that it is possible that some non-wetland upland areas may be identified as wetlands due to relic indicators of previous wetland characteristics that no longer reflect current hydrologic conditions. This is because indicators of wetland characteristics, particularly indicators of hydric soil, can persist at a site even after hydrologic conditions have changed, either due to natural or anthropogenic causes (Lewis, 1995).

An inherent weakness of the one-of-three approach is that any one indicator may be used alone to classify an area as a wetland. Relic soil indicators may be a useful tool when hydrologic conditions have recently changed, such as through unpermitted wetlands fill; however, changes in the more distant past may or may not be within an agency's intended regulatory scope. The problem of false-positive wetland identifications can be further complicated when considering indicators of hydrophytic vegetation. As noted in the National List of Plant Species that Occur in Wetlands (USFWS, 1997), a number of plant species can grow in either wetland or non-wetland conditions. The specific hydrophytic status of such facultative species depends on factors such as the geographic location and individual site conditions. Relying on the presence of these species alone to make a wetland determination may in some cases lead to the classification of non-wetland areas as wetlands.

A further weakness of the one-of-three parameter approach is that there have been no delineation manuals developed by any agency for this type of definition. This is significant because, as the National Research Council recognized in its report to Congress on wetland characteristics and boundaries:

> All [wetland] definitions…are too broad to be applied directly to regulatory practice without substantial accompanying interpretation (Lewis 1995, p. 59).

And,

> Any regulatory definition of wetlands has full practical significance only through interpretation at three levels: criteria, indicators, and recognition of regional variation (Lewis 1995, p. 63).

By contrast, the Corps' 1987 Manual and Supplements provide clear field delineation standards for identifying wetlands under Corps three-of–three wetland definition.

Finally, because the one-of-three parameter approach is not used for regulatory purposes at the federal level, if the Water Boards were to adopt this type of definition as the state wetland definition, it would create major inconsistencies with USEPA and Corps wetland definitions. For these reasons, the State Water Board rejected the "one-parameter approach" as a viable alternative.

Apply a Two-Criteria Test

The State Water Board also considered a two-criteria test, in which an area must have any two of the three wetland indicators (wetland hydrology, hydric soils, and hydrophytic vegetation) to be considered a wetland. The two-criteria alternative is less inclusive than the one-criteria alternative, but more inclusive than the other alternatives. This alternative may result in more areas being identified as wetlands than is currently the case. As such, this alternative could meet the proposed Procedures objective of advancing statewide efforts to ensure no overall net loss and a long-term net gain in the quantity, quality and sustainability of wetlands in California.

While not as prone to inaccurate identifications as the one-criterion alternative, this approach has not been used by state or federal agencies for either monitoring or regulatory purposes. There are therefore no field manuals describing how to delineate wetlands specifically using this method (although the Corps' manuals could potentially be used to identify each of the criteria). The two-criteria alternative would also result in "false-positive" issues as noted above if based on either soils or vegetation. It would create inconsistencies with USEPA and the Corps permitting of discharges of dredged and fill material, which employs the three-criteria test. This alternative would therefore not conform to the proposed Procedures objective of establishing a uniform regulatory approach consistent with the federal CWA section 404 program for the discharge of dredged or fill material into waters of the state, including wetland areas that are also waters of the state.

Apply a Three-Criteria Test

The Corps' definition of wetlands, along with its guidance documents, is an example of a three-criteria approach because consideration of all three factors – hydrology, hydric soils, and hydrophytic vegetation – is included. Without all three parameters present, an area is not considered a wetland by the Corps.

From a wetland identification standpoint, strength of the three-of-three parameter approach is that there is an internal verification scheme inherent within the identification process that ensures that individual indicators of wetland hydrology, hydric soils, and hydrophytic vegetation are in fact wetland indicators. This verification occurs by virtue of the requirement that an indicator of any one characteristic be used to support wetland identification only when indicators of the other two characteristics are also present.

However, the weakness of this approach is that the three-of-three test leads to the exclusion of some important wetland types in California, such as un-vegetated coastal mudflats, playas and some seasonal wetlands.[74] As such, the State Water Board rejected the "three-criteria test" as a viable alternative.

Apply a Modified Three-Criteria Test

Under this alternative, the wetland definition is:

> An area is wetland if, under normal circumstances, (1) the area has continuous or recurrent saturation of the upper substrate caused by groundwater, or shallow surface water, or both; (2) the duration of such saturation is sufficient to cause anaerobic conditions in the upper substrate; and (3) the area's vegetation is dominated by hydrophytes or the area lacks vegetation.

This definition is similar to the federal definition[75] in that it identifies three wetland characteristics that determine the presence of a wetland: wetland hydrology, hydric soils, and hydrophytic vegetation. Unlike the federal definition, however, the proposed Procedures' wetland definition includes one exception: it would only require the presence of hydric soils and wetland hydrology for an area devoid of vegetation (less than 5% cover) to be considered a wetland. However, if any vegetation is present, then the Corps' delineation procedures would apply to the vegetated component (i.e., hydrophytes must dominate). Examples of waters that would be considered wetlands by the proposed Procedures, but not by the federal definition, are non-vegetated wetlands, or wetlands characterized by exposed bare substrates like mudflats and playas.

[74] To at least some extent, these concerns are mitigated by the use of Corps wetland delineation manuals designed for application to arid Western wetland delineation.

[75] USEPA wetland definition: areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support and that under normal circumstances do support a prevalence of vegetation typically adapted for life in saturated soil conditions (40 CFR 230.3(t) and 40 CFR 230.41(a)(1)).

10.3 Issue: Wetlands Delineation Methods

The Water Boards generally apply the Corps' 1987 Manual and Supplements for wetland delineation. However, as described in Section 5, "Program Background," delineation procedures are inconsistent across Water Boards. There is a need for a single set of delineation methods for all Water Boards, to ensure the consistent identification of wetlands as defined in Section 6, 'Project Description."

Rely on the Corps' Delineation Methods

One option is to continue to rely on the Corps' Manual and Supplements for wetland delineation. This approach would be consistent with delineation methods already used at the federal level. As noted in Section 6, "Project Description" there is an internal verification scheme inherent within the identification process that ensures that individual indicators of wetland hydrology, hydric soils, and hydrophytic vegetation are in fact wetland indicators.

However, using the Corps' delineation methods with no modifications would lead to the exclusion of some important wetland types in California, such as un-vegetated coastal mudflats, playas, and some seasonal wetlands. As such, an unmodified application of the Corps' delineation methods would not meet the objectives of the proposed Procedures.

Use Modified Corps' Delineation Methods

The wetland delineation procedures in the proposed Procedures are based on the Corps' 1987 Manual and Supplements, but allow Water Boards to adjust the 1987 Manual and Supplements to delineate non-vegetated wetlands. In addition, the proposed Procedures would allow for supplemental field data from the wet season to be collected to substantiate wetland delineations conducted in the dry season. As such, the delineation procedures in the proposed Procedures take advantage of established federal procedures while accommodating the variable wetland types present in California, meeting the stated objectives of the proposed Procedures.

10.4 Issue: Procedures for Regulation of Discharges of Dredged or Fill Material

Currently, the Water Boards are responsible for issuing section 401 certifications for projects involving waters of the United States. Projects discharging dredged or fill material to non-federal waters (which are not subject to CWA section 404 regulations) also fall under the Water Code permitting requirements for water quality administered by the Water Boards. The Water Boards issue WDRs for these projects. One of the objectives of the proposed Procedures is to create a single set of permitting requirements for these activities under both section 401 certifications and WDRs.

Do Not Provide Uniform Procedures

Under this alternative, the State Water Board would not provide uniform procedures, and current practices would continue. It is possible that some Water Boards are currently applying some or all of the elements of the proposed Procedures requirements. However, it is not possible to determine the full

extent of these applications. Each Water Board's practice is based on how that Water Board interprets its authority to regulate waters of the state, and it is not always readily apparent simply by reviewing Basin Plans, existing permits, and other regulations.

Because of the inconsistencies, uncertainty, and inefficiencies associated with the current absence of uniform permitting procedures for all waters of the state, the State Water Board rejected this option.

Establish Uniform Permitting Procedures Modeled on Federal Permitting Procedures

The State Water Board considered adopting the federal Guidelines and associated Regulatory Guidance Letters without any changes or modifications. The Water Boards would apply the federal Guidelines to all waters of the state (including those that are not under federal jurisdiction). The advantage of this approach would be consistency with the federal program.

The disadvantage would be a missed opportunity to adjust the federal program for long-standing Water Board issues with the federal program. Specifically, the proposed Procedures adds clarity to the use of the watershed approach to the approval of permits and mitigation for the discharge of dredged or fill material, incentivizes the use of watershed plans by reducing mitigation requirements for plan approval by the Water Boards, and adjusts mitigation requirements to better address project watershed aquatic resource needs. Therefore, this alternative would not be as protective of waters of the state. Additionally, there would be no process for exempting the alternative analysis requirement for projects with minimal impacts. For these reasons, the State Water Board has rejected this alternative.

Establish Uniform Procedures Modeled on Federal Procedures, But Provide Additional Guidance and Requirements

This alternative is to establish uniform procedures based on federal procedures, but applicable to all waters of the state (including those not under federal jurisdiction) and with modifications for additional guidance and requirements. The additional guidance and requirements beyond those included in federal permitting procedures and existing WDR requirements are described in detail in Section 6, "Project Description." As described above, these differences support a more comprehensive watershed approach to review and approval of applications. Additionally, the proposed Procedures provide a process for exempting the alternatives analysis requirement for projects with minimal impacts in order to better align with the Corps' alternatives analysis requirements. As to the latter, the Corps does not require alternatives analyses from applicants for general permits for projects with minimal impacts (e.g., nationwide permits) since the Corps provides the analysis when developing general permits.

10.5 Issue: Exemptions

The CWA exempts six categories of activities, including farming, ranching, and silviculture, from dredged or fill regulation (see CWA section 404(f), 33 CFR 232.3(c), and 33 CFR 323.4). In addition to these classes

of activities, certain areas that are outside of the definition of "waters of the United States" are also exempt, including prior converted cropland and waste treatment ponds.

Do Not Exempt Any Activities or Areas

One potential alternative to maximize protection of wetlands is not to exempt any activities or areas from application requirements. Under this alternative, all project proponents seeking to discharge dredged or fill material would be subject to the proposed Procedures. The advantage of this approach is that there would be increased evaluation of project alternatives, and potentially increased protection of all state waters, including wetlands, from dredged or fill discharges related to the farming, ranch and silvicultural activities.

The disadvantages of this approach are that the proposed Procedures would not be consistent with the CWA section 404 program. This could contribute to potential compliance issues stemming from confusion over differences in federal/state regulations, and cause inefficiencies and increases in administrative costs due the lack of a supporting federal program regulating these activities and areas. It would require Water Board regulation of farming, ranch and silvicultural activities for dredged or fill discharges under the proposed Procedures requirements that may be more effectively regulated under other Water Board authorities and programs. For these reasons, the State Water Board rejected this alternative.

Exempt all CWA §404(f)(1) Activities and Areas

For consistency with the federal program and efficiency in program management, the proposed Procedures for the regulation of dredged or fill discharges conform to the federal dredged or fill program. This alternative exempts the same activities and areas as the federal program. However, the exemptions do not limit the Water Board's ability to issue WDRs for these waters or activities in accordance with the California Water Code.

11. ECONOMIC CONSIDERATIONS

Several sections of the California Water Code and CEQA require that the Water Boards consider economics when they regulate water quality. Water Code section 13000 states that "[a]ctivities and factors which may affect the quality of the waters of the state shall be regulated to attain the highest water quality which is reasonable, considering all demands being made and to be made on those waters and the total values involved, beneficial and detrimental, economic and social, tangible and intangible." This section of the Water Code, while applicable to the proposed Procedures, does not place any affirmative duty on the Water Boards to conduct a formal economic analysis.

Water Code section 13141 relates to implementation of agricultural water quality control programs, and is not applicable to the proposed Procedures. Water Code section 13241 requires that the Water Boards consider economics when they adopt water quality objectives. Because the proposed Procedures do not contain water quality objectives, section 13241 is not applicable.

CEQA requires that whenever the Water Boards adopt rules that require the installation of pollution control equipment or establish a performance standard or treatment requirement, the Water Boards must conduct an environmental analysis of the reasonably foreseeable methods of compliance.[76] This analysis must take into account a reasonable range of factors, including economics. However, the proposed Procedures do not require the installation of pollution control equipment or establish a performance standard or treatment requirement.

The CWA and its implementing regulations do not require consideration of economics when setting water quality criteria. According to the USEPA, economics should be addressed during the designation, or de-designation, of potential beneficial uses,[77] which the proposed Procedures do not attempt to do. Federal public participation regulations also require, whenever possible, that social, economic and environmental consequences be clearly stated in informational material.[78]

Porter-Cologne Section 13241 requires the Water Boards to take "economic considerations," among other factors, into account when they establish water quality objectives. To meet the economic considerations requirement, State Water Board (1999; 1994) concluded that, at a minimum, the Regional Water Boards must analyze:

- Whether the proposed objective is currently being attained;
- If not, what methods are available to achieve compliance; and
- The cost of those methods.

[76] Pub. Res. Code § 21159, 14 CCR 15064
[77] 40 CFR 131.10(d) and 40 CFR 131.10(g)(6)
[78] 40 CFR 25.4

If the economic consequences of adoption are potentially significant, the Water Boards must explain why adoption is necessary to ensure reasonable protection of beneficial uses or prevent nuisance. The Boards can adopt objectives despite significant economic consequences; there is no requirement for a formal cost-benefit analysis.

The proposed Procedures do not include water quality objectives. However, consistent with State Water Board guidance for considering economics of policies that establish objectives, and that the Regional Boards then adopt in their Basin Plans, this section of the Staff Report includes an analysis of compliance with the proposed Procedures, methods for achieving compliance, and the cost of those methods.[79]

11.1 Baseline for the Analysis

Section 5 provides a description of the program, including existing regulations. Under baseline requirements, discharges to waters of the state, including wetlands, must comply with a variety of federal and state procedural, analytical, and discharge limitation requirements. The current regulatory framework is the baseline for measuring the potential incremental changes associated with the proposed Procedures.

11.2 Estimated Extent of Current Consistency with Proposed Procedures

As discussed in Section 6, "Project Description", many elements of the proposed Procedures are the same as the federal Guidelines, meaning that much of the proposed Procedures are already applicable to projects in waters that are under federal jurisdiction. As such, the proposed Procedures will not significantly change the regulation of dredged or fill projects in waters of the state under federal jurisdiction, and the majority of applicants are already in compliance with the proposed Procedures.

A small number of WDRs each year (currently less than 1% of permits; see Section 5, "Project Background") are for discharges to waters of the state that are not federally jurisdictional and therefore not already subject to the CWA and Corps permitting requirements. In many cases, elements of the proposed Procedures are already applicable to these WDRs. For example, State Water Board Water Quality Order No. 2004-004-DWQ, which is restricted to non-federal waters, requires compensatory mitigation for discharges to all waters of the state. However, the current regulatory framework for these WDRs does not include a formal alternatives analysis and selection of the LEDPA. In addition, as discussed in Section 6, alternatives analysis procedures have been inconsistent across the Water Boards. Some regions may require fewer alternatives analyses under the proposed Procedures, and others may

[79] This analysis does not represent a cost-benefit analysis.

require more. This could be true for both discharges solely to waters of the state, and for discharges to waters of the US that are regulated under individual orders. However, this is expected to affect only a small number of applicants and, on balance, the statewide effect would be similar to baseline.

To identify the extent of current compliance with the proposed Procedures, the State Water Board evaluated a selection of these types of Orders. Table 11-1 summarizes the results. The proposed Procedures may also have the effect of shifting activities away from waters of the state to avoid dredge and fill impacts. However, there is no information with which to assess the magnitude of resulting costs. Where upland land costs are higher, there may also be opportunity for higher project returns. Such circumstances are highly site and project specific.[80]

Table 11- 1. Estimated Compliance with Proposed Procedures

Order (Year)	Project Type	Evaluation of Consistency with Proposed Procedures
State Water Board		
Water Quality Certification Amendment 2, CALTRANS Donner Segment 3 Roadway Rehabilitation Project (2008)	Transportation (road rehabilitation and upgrade)	May not be consistent with proposed requirement for alternatives analysis; Corps NWP 23 (non-certified)[1]
WDR for Southern California Edison Company for Segments 4, 5, and 10 of the Tehachapi Renewable Transmission Project; WDID No. SB10003IN (2010)	Construction of electricity transmission infrastructure	Consistent; Order indicates alternatives were evaluated and LEDPA selected
2004-0004-DWQ, Statewide General WDR for Dredged or Fill Discharges to Waters Deemed by the Corps to be Outside of Federal Jurisdiction (2004)	Discharge of not more than 0.2 acre and 400 linear feet of fill [waivers for discharges exempt from CWA Section 404(f)]	Consistent; mitigation plan requires alternatives analysis effort commensurate with the purpose of the discharge and value of waters/level of impact

[80] Orders used in the economic analysis are from Orders that were issued in 2008-2011. Procedures for application review and approval remains unchanged from the time this sample was taken and reflects current practice.

Table 11- 1. Estimated Compliance with Proposed Procedures

Order (Year)	Project Type	Evaluation of Consistency with Proposed Procedures
Region 1		
Notice of Coverage, Waiver of WDRs for Minor Dredging and Fill Activities for the Rudy Light, West Fork Russian River Streambank Stabilization Project (2010)	Streambank stabilization	Consistent; proposed Procedures allows for exemption of alternatives analysis for projects that by their nature cannot be located in alternate locations, such as bank stabilization projects. On-site alternatives were implemented for this project by implementing bioengineering techniques and minimizing the installation of rip-rap.
Water Quality Certification for the Campbell Creek Apartments; WDID No. 1B11088NHU (2011)	Apartment building construction	May not be consistent with requirement for alternatives analysis and selection of LEDPA; Corps NWP 29(non-certified); Mitigated Negative Declaration issued under CEQA
Water Quality Certification for the Humboldt County DPW – Williams Creek Bridge Replacement at Williams Creek Road; WDID N. 1B11048NHU (2011)	Bridge replacement	Likely consistent; maintenance of serviceable structures may be exempt from requirements because the project could not be located anywhere else; Corps NWP 3 issued (non-certified)
Region 2		
WDR for Stanford University; Culverting of a Seasonal Channel Between Olmstead Road and Stanford Ave; Order No. R2-2008-0072 (2008)	Construction of campus housing; filling of a seasonal channel	Consistent; project is consistent with University plan, which was subject to full EIR pursuant to CEQA and associated alternatives analysis requirements for impacts to waters
Water Quality Certification for Repair and Restoration of Creek Channel and Riparian Area (2010)	Channel stabilization, repair, and restoration	Consistent; project will enhance natural channel and would receive an alternatives analysis exemption because the project could not be located in an alternate location; Corps issued NWP (non-certified)

Table 11- 1. Estimated Compliance with Proposed Procedures

Order (Year)	Project Type	Evaluation of Consistency with Proposed Procedures
Water Quality Certification for the Irrigation Pond Project at the Sunol Valley Golf Course (2010)	Improvement of golf course irrigation water retention system	May not be consistent with requirement for alternatives analysis and selection of LEDPA; Corps permit issued under non-certified NWP 13; Negative Declaration issued under CEQA
Region 3		
Technically Conditioned Water Quality Certification Number 34210WQ17 for Santa Maria River: Bonita School Road and Flap Gate Pilot Channels (2010)	Channel excavation	Consistent; proposed Procedures allow for exemption of alternatives analysis because the project could not be located in an alternate location
Water Quality Certification Number 33510WQ01 for the Storm Repair at Coalinga Road Over Horsethief Canyon Creek Project (2010)	Culvert replacement and road washout repair	Likely Consistent; maintenance of serviceable structures exempt from alternatives analysis proposed Policy requirement because the project could not be located in an alternate location; Corps NWPs 14 and 33 (non-certified)
Water Quality Certification and WDR for Los Angeles County Flood Control District, Proposed Maintenance clearing of Engineered Earth-Bottom Flood Control Channels; Order No. R4-2010-0021 (2010)	Vegetation and debris clearing from 99 earth-bottom channel reaches for flood protection	Likely consistent; proposed Procedures allow for alternatives analysis exemption because the project could not be located in an alternate location; Corps NWP 31 (non-certified)
Region 4		
Water Quality Certification for Proposed Viewpoint School Modernization – 2010 Hydrology Improvement Project (2010)	Flood control improvements for school modernization project	Consistent; permit indicates that an alternatives analysis was completed and LEDPA selected
WDR for City of Ventura, Moreland Drainage Ditch Channel Maintenance; Order No. R4-2009-0093 (2009)	Ditch dredging	Consistent; proposed Procedures allow for alternatives analysis exemption because the project could not be located in an alternate location

Table 11- 1. Estimated Compliance with Proposed Procedures

Order (Year)	Project Type	Evaluation of Consistency with Proposed Procedures
Region 5		
WDR for Tejon Mountain Village, LLC; Order No. R5-2011-0018	Resort development	May not be consistent with requirement for alternatives analysis and selection of LEDPA; EIR completed pursuant to CEQA
Clean Water Act §401 Technically Conditioned Water Quality Certification and WDR for Discharge of Dredge and/or Fill Material; Feather River Parkway/Willow Island Project (WDID#5A51CR00055) (2010)	Park establishment	May not be consistent with need for alternatives analysis and selection of LEDPA; Corps permit issued under non-certified NWP 42; Mitigated Negative Declaration issued under CEQA
Amendment for the Clean Water Act §401 Technically Conditioned Water Quality Certification and WDR for Discharge of Dredged and/or Fill Materials; Granite Lakes Estates Project (WDID#5A1CR00291) (2010)	Residential development	May not be consistent with need for alternatives analysis and selection of LEDPA; EIR completed pursuant to CEQA; Corps permit issued under non-certified NWP 29
Region 6		
Notice of Applicability for General WDR for Small Construction, including Utility, Public Works, and Minor Streambed/Lakebed Alteration Projects, Board Order No R6T-2003-0004, Coram California Development Limited Partners Cameron Ridge Wind Project (2011)	Construction and operation of wind energy generation facility	May not be consistent with need for alternatives analysis and selection of LEDPA; Mitigated Negative Declaration issued under CEQA
Water Quality Certification for the Eagle Lake Sewage Pond Fence Project; WDID 6A181004007 (2010)	Repair and upgrade of wastewater treatment facility	Consistent; permit indicates that alternatives were considered in the Environmental Assessment; Corps permit issued under non-certified NWP 18; Mitigated Negative Declaration issued under CEQA

Table 11- 1. Estimated Compliance with Proposed Procedures

Order (Year)	Project Type	Evaluation of Consistency with Proposed Procedures
Order to Amend CWA §401 Water Quality Certification and WDR Exemption, Donner Lake Public Pier Replacement Project; WDID No. 6A290906004 (2010)	Replacement of 2 piers	Likely consistent; proposed Procedures allow for alternatives analysis exemption because the project could not be located in an alternate location; Corps NWP 18 (non-certified); exempt from CEQA
Region 7		
Order for Technically-Conditioned CWA §401 Water Quality Certification for Discharge of Dredged and/or Fill Materials (2010)	Bridge replacement	Likely consistent; proposed Procedures allow for alternatives analysis exemption because the project could not be located in an alternate location; Corps NWP 3 (non-certified) ; exempt from CEQA
Regional General Permit No. 63 Pre-Construction Notification for No. SPL-2010-01178-SME (2010)	Pole replacement	Likely consistent; proposed Procedures allow for alternatives analysis exemption because the project could not be located in an alternate location
Region 8		
CWA §401 Water Quality Standards Certification for Stonefield Chino Hills 37 – TTM 18393 (2010)	Residential development	May not be consistent with requirement for alternatives analysis and selection of LEDPA; EIR completed pursuant to CEQA; Corps permit issued under non-certified NWP 29
WDR Order No. R8-2010-54 for Hemet Hospitality Investments LLC, Florida Promenade Specific Plan Amendment (2010)	Commercial development	Likely not consistent with requirement for alternatives analysis and selection of LEDPA; Mitigated Negative Declaration issued under CEQA

Table 11- 1. Estimated Compliance with Proposed Procedures

Order (Year)	Project Type	Evaluation of Consistency with Proposed Procedures
CWA §401 Water Quality Standards Certification for the Rancho Jurupa Sports Park Project (2010)	Installation of a drainage outlet	May not be consistent with requirement for alternatives analysis and selection of LEDPA, but the project could be exempt from the alternatives analysis requirement if the project proponent demonstrates that avoidance and minimization is sufficient to satisfy the alternatives analysis requirement because the project has minimal impacts to waters (permit indicates that impacts would be restricted to 0.003 acres); Corps NWP 7(non-certified); Mitigated Negative Declaration issued under CEQA
Region 9		
Action on Request for CWA §401 Water Quality Certification and Waste Discharge Requirements for Discharge of Dredged and/or Fill Materials; Kingdom Hall of Jehovah's Witnesses Project, Certification No. 11C-028 (2011)	Kingdom Hall construction	Likely not consistent with requirement for alternatives analysis and selection of LEDPA; Corps permit issued under non-certified NWP 14; Mitigated Negative Declaration issued under CEQA
Action on Request for CWA §401 Water Quality Certification for Tijuana River Valley Wetland Mitigation Project, 09C-021 (2011)	Wetland restoration for mitigation credits	May not be consistent with requirement for alternatives analysis and selection of LEDPA; EIR completed pursuant to CEQA; Corps permit issued under non-certified NWP 27, 33, and 43
CWA §401 Water Quality Standards Certification No 11C-007 for the State Route 79 Widening Project (2011)	Road widening	May not be consistent with requirement for alternatives analysis and selection of LEDPA; Corps permit issued under non-certified NWP 14; Mitigated Negative Declaration issued under CEQA

Orders for discharges of dredged or fill materials to waters of the state (including wetlands), as shown in Table 11-1, are largely in compliance with the proposed Procedures.[81] However, there may be some inconsistency with respect to the alternatives analysis requirement and selecting the LEDPA. In some instances, information contained in the orders is not sufficient to make such a determination. Additionally, the alternatives analysis requirements may already be partially or fully satisfied if the project is subject to full CEQA review (whether or not the proposal affects waters of the state under existing regulations). CEQA Guidelines require EIRs to:

> "describe a range of reasonable alternatives to the project, or to the location of the project which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives" (section 15126.6(a)).

Since EIRs cover a much broader set of environmental impacts[82] than impacts to water resources (including wetlands), alternatives analyses conducted pursuant to CEQA may be very detailed and rigorous. As such, the CEQA alternatives analyses for individual projects may be sufficient to fulfill proposed Procedures requirements.

With respect to the requirements of the proposed Procedures, a site specific project EIR analysis likely contains all the site description and project planning documentation needed for the alternatives analysis and LEDPA selection. However, the alternatives analysis in an EIR does not always include alternatives designed specifically to avoid or minimize impacts to waters; rather, the alternatives assessed are often larger-scale project alternatives. An alternatives analysis specific to the proposed Procedures may include other alternatives more focused on impacts to these waters only, such as alternative locations to the waters.

Additionally, the proposed Procedures require that the Water Boards consider the potential effects of a discharge using a watershed approach, which is an analytical process for evaluating the environmental effects of a proposed project and making compensatory mitigation decisions that support the sustainability or improvement of the abundance, diversity, and condition of aquatic resources in a watershed. Some existing Orders do not explicitly cite a watershed approach. Further, while the federal Guidelines require using a watershed approach in establishing compensatory mitigation plans, federal guidelines do not require such an approach for evaluating discharges of dredged or fill material.

[81] Activities that are exempt from requirements under CWA §404 are also exempt from the proposed Policy requirements.

[82] EIRs must consider impacts to the following resource areas: aesthetics, agriculture and forest resources, air quality, biological resources, cultural resources, geology and soils, greenhouse gas emissions, hazards and hazardous materials, hydrology and water quality, land use and planning, mineral resources, noise, population and housing, public health and vector control, public services, recreation, transportation and traffic, and utilities and service systems.

However, the Water Boards are generally already implementing a watershed approach, as demonstrated by the preference for on-site mitigation within the project watershed and restoration of natural functions of waterbodies for Orders requiring mitigation to sustain watershed services. Additionally, as shown in Table 5-3, the Water Boards conduct a review of watershed considerations as part of the technical review of applications.

11.3 Compliance Methods and Costs

The universe of future applicants and projects involving dredged or fill discharges is largely unknown. Although the types of future activities that could impact waters of the state, are expected to be similar to those that have required section 401 certification and WDRs in the past (e.g., infrastructure construction and maintenance, housing development), the particular projects, extent and location of the waters that may be affected will be shaped by a number of factors, including future economic and demographic trends. Thus, only a general qualitative assessment of potential incremental costs is practicable. This section discusses the potential cost impacts of methods available to achieve compliance with the proposed Procedures.

Alternatives Analysis

The proposed Procedures require that, with some exceptions, applicants seeking to discharge dredged or fill material to waters of the state conduct an analysis of practicable alternatives to determine the LEDPA. Practicable alternatives may include alternative available locations, designs, and reductions in size, configuration, or density.

The proposed Procedures provide some flexibility as to the extent of the required alternatives analysis. For example, if a proposed project will minimally impact water quality, then the Water Boards may determine that applicant proposed avoidance and minimization measures are sufficient analysis. This could apply to projects similar to the drainage outlet installation in Region 8 shown in table 11-1, which has impacts limited to 0.003 acres. Similarly, the project may be exempt from the alternatives analysis requirement for discharges planned in accordance with existing watershed plans or regional plans that have already been assessed. For example, Stanford University's campus housing construction in Region 2 was done in accordance with the University plan, which had previously been assessed with a full EIR including alternatives pursuant to CEQA.

For other projects, the level of effort associated with the requirements may be minimal. For example, the certification by the San Francisco Bay Water Board for an irrigation pond project at a golf course permitted by the Corps under nationwide permit 13 did not indicate the inclusion of an alternatives analysis. However, detailed site design, storm water control, and mitigation plans and evaluation are already documented in the certification, and the level of effort associated with evaluating alternatives to impacting wetlands may be relatively small. The same would likely be true for many of the section 401 certifications as roughly 80% of these Orders are typically issued for impacts of less than one-tenth of an acre to waters of the state (data based on compilation of water quality certifications issued 2009-2013).

The proposed Policy requires applicants to consider a range of practicable alternatives that may have less adverse environmental impacts. It incorporates the federal Guidelines, which describe "practicable" as:

> available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes. If it is otherwise a practicable alternative, an area not presently owned by the applicant, which could reasonably be obtained, utilized, expanded or managed in order to fulfill the basic purpose of the proposed activity may be considered.

Consideration of what constitutes a practicable alternative will vary depending on the type of project proposed. The determination of what constitutes an unreasonable expense of an alternative should relate to whether the projected cost is substantially greater than the costs normally associated with the particular type of project.

Under existing policy and regulatory conditions, applicants are likely to compile extensive documentation of environmental impacts, site design, stormwater controls, mitigation strategies, and other relevant factors, especially if they are subject to full CEQA review. As such, analysis to examine alternatives that would avoid or minimize impacts to waters of the state may represent a small portion of the costs of the existing analysis. Projects that are not subject to CEQA review are likely to be less complex than those subject to CEQA. As such, the level of effort that would be needed would likely be commensurate with the scope and potential for adverse environmental impacts on the aquatic environment, similar to implementation of federal Guidelines. Since these projects are not subject to full CEQA review, significant environmental impacts may be unlikely.

The costs of analyzing project alternatives and selecting LEDPA will be highly site- and project-specific; however, such costs are not likely to account for a large share of overall project costs. For example, the need to evaluate alternatives to filling a roadside drainage ditch that includes some wetland as part of widening a road may involve determining the impacts of a number of alternatives: not widening the road, widening the road on the other side, and widening the road around the wetland area with a separated lane. The applicant may have evaluated many of these options as part of the current design plan (e.g., in identifying lowest cost design alternatives; evaluating storm water control plans).

The cost of preparing an alternatives analysis is some fraction of the total cost of permit preparation. Based on a sample of 103 individual permits and nationwide permits (primarily for projects such as road maintenance, flood control, and stormwater management work), Sunding and Zilberman (2002) estimated an average cost to an applicant of preparing a nationwide permit application of $30,000, with a median of $11,000 and range of $2,000 to $140,000. Of the projects receiving nationwide permits in the sample, 58 percent had discharges affecting more than one-half of an acre of wetlands.

If the applicable Water Board determines that an alternatives analysis or justification for LEDPA selection is insufficient, it may request additional information, analyses, or justifications. Selection of the LEDPA may also require additional project planning or longer-term construction. There may be opportunity costs in such cases including for idled and extended labor and equipment costs, storage, bonds, material inflation, home office overhead, field office overhead, and other project components (Zack and Badala, 2011). Alternatively, the consistency provided by the proposed Policy may enable better and more efficient project planning, reducing costs associated with uncertainty.

Alternate Project Designs

Alternatives analysis may or may not result in identifying alternate project designs that avoid or minimize adverse environmental impacts, including cumulative impacts. Whether such analyses will lead to project design alterations with implications for overall project costs is also unknown. Design changes associated with avoiding areas recurrently inundated with water could lead to costs (e.g., if applicants are required to move the project to a more expensive upland lot away from wetlands) or cost savings (e.g., if design or site alterations lead to less extensive alterations or construction or results in less compensatory mitigation).

Additionally, by selecting LEDPA, applicants may avoid other regulatory requirements arising from proposed discharges to wetland ecosystems if the alternate project design eliminates such discharges. For example, the California Fish and Wildlife Code (section 1601- section 1603) restricts alterations to rivers, streams, and lakes, including diversion, obstruction, and fill-related activities that will impact fish and wildlife resources. It requires proposed projects to obtain a permit from the California Department of Fish and Wildlife (CDFW) detailing measures that the applicant will take to protect fish and wildlife resources. By avoiding potential for these impacts, LEDPA selection may reduce the associated permitting and project design costs. If the LEDPA avoids impacts to wetland habitats, this alternative may similarly reduce costs associated with federal and state Endangered Species Act consultations, local zoning for wetland projects, and other requirements.

Selection of the LEDPA may be associated with opportunity costs compared to the proposed site location, or may result in increased project profitability. There may also be other distributional economic impacts that may accrue to different parties (not just the applicant), just as there are with the original project design. However, given that the universe of potentially affected projects is unknown, the types and magnitudes of potential costs or cost savings are unknown.

Compensatory Mitigation

Since all waters of the state area already subject to compensatory mitigation requirements, the proposed Procedures are not likely to change the quantity or size of compensatory mitigation projects required statewide. However, there may be some minor increases or decreases in compensatory mitigation project requirements at the project level. For example, if the proposed Procedures result in some projects relocating away from wetlands via selection of LEDPA, this may result in a decrease in the number of compensatory mitigation projects. As such, there may be some indirect cost savings to

project developers due to avoided compensatory mitigation projects and associated requirements. For informational purposes and to document the range of economic considerations, this section discusses the potential magnitude of these costs or cost savings.

Compensatory mitigation includes costs associated with the purchase of credits, biological studies, land acquisition, engineering design, capital (including plant and materials), monitoring, and operations and maintenance (including labor and energy). Such costs are site- and project-specific, reflecting a number of factors: availability of onsite mitigation opportunities; availability and value of nearby offsite mitigation locations; amount and type of mitigation; and complexity and value of the resources affected. Additionally, the costs of compensatory mitigation also include financial assurances (e.g., performance bonds, escrow accounts, casualty insurance, letters of credit, and legislative appropriations) and long-term site protection. The Water Boards have also been including such provisions in WDRs.

The Environmental Law Institute (ELI, 2007) notes that while all compensatory mitigation methods face the same costs of long-term management, site protection, and easement defense, other factors result in significant cost differentials. The primary costs related to wetland preservation may be land acquisition, while creation may require significant earth-moving activities, planting, and the installation of water-control structures. Restoration and enhancement involve manipulating conditions at existing or previously existing wetland sites, and therefore may carry fewer construction costs than creation.

Martin et al. (2006) note that permittee-responsible compensatory mitigation costs are not fully observable, and are likely to be highly variable based on project size, difficulty, and land costs. Costs include those associated with:

- ***Compliance***: identifying and securing compensatory mitigation sites; preparing mitigation project plans for review and approval; and construction, monitoring, and long-term maintenance of the project;
- ***Time***: potential opportunity costs of any delay in permit issuance associated with the development and approval of mitigation plan; and
- ***Risk***: potential remediation costs if the compensatory mitigation project fails to fulfill objectives.

As part of an economic analysis of forthcoming guidance regarding the definition of waters of the United States, USEPA and the Corps (2011) estimated compensatory mitigation costs in each state, based on public data records, phone inquiries, internet searches, and published studies. USEPA and the Corps

(2011) found that costs for compensatory mitigation projects in California (2009 to 2010) range from $18,500 to $159,250 per acre.[83]

These mitigation costs are not likely to represent a substantial portion of total project costs. Parker et al. (2007) evaluated the impacts of compensatory mitigation requirements on development potential on 11 sites in Oregon, and found that, due to the rapid increases in development and construction costs, on-site or off-site mitigation do not account for a large percentage of development costs overall. According to their analysis, mitigation costs represent 1% to 5% of total project construction costs.[84]

Table 11-2 shows sample compensatory mitigation project costs based on wetland restorations projects completed by the Southern California Wetlands Recovery Project (SCWRP). For those projects for which SCWRP reports both the acreage and cost, Table 11-2 lists the unit cost rate for the various activities reflected by the total project costs. Smaller scale mitigation projects may be associated with higher (e.g., due to lack of economies of scale, or expertise of entity performing the mitigation) or lower (e.g., need for smaller area; higher potential for success with lower complexity) unit costs.

Table 11- 2. Southern California Wetlands Recovery Project Completed Projects

Title (Local Lead)	Total Cost	Description
Restoration		
Cottonwood Creek Park Riparian Restoration (City of Encinitas)	$272,500	Recreate portions of riparian stream corridor on Cottonwood and Moonlight Creeks, in northern San Diego County
Upper Sulphur Creek Restoration Project (City of Laguna Niguel)	$1,385,780	Restore up to 28 acres of wildlife habitat as native wetland, transitional and scrub plant communities along 1.7-miles of Upper Sulphur Creek, including removing 3600 feet of concrete channel.
Summerland/Greenwell Preserve Restoration (Summerland Greenwell Preserve)	$181,827	Restore 2 acres of riparian habitat at the Summerland/Greenwell Preserve

[83] USEPA and the Corps (2014), an updated cost-benefit analysis of the proposed waters of the United States definition, uses the same cost estimate.

[84] This excludes one outlier, for which on-site mitigation represented 65% of construction costs because it required using a large portion of the buildable land on-site. Off-site mitigation for the project was less than 5%.

Table 11- 2. Southern California Wetlands Recovery Project Completed Projects

Title (Local Lead)	Total Cost	Description
San Elijo Lagoon Exotics Removal (San Elijo Lagoon Conservancy)	$73,000	Remove exotics plants from approximately 2.4 acres along the southern edge of San Elijo Lagoon and revegetate with native and buffer species.
Malibu Creek Arundo Removal Project (Mountains Restoration Trust)	$358,400	Remove *Arundo donax* from approximately 5.2 miles of stream corridor along Malibu Creek.
Santa Barbara Urban Streams and Wetlands Restoration (Community Environmental Council)	$322,000	Implementation of the San Jose Creek Restoration Plan, and preparation of an enhancement plan for four Santa Barbara County watersheds.
Arroyo Burro Estuary and Mesa Creek Restoration (City of Santa Barbara)	$1,089,000	Expanded the Arroyo Burro Estuary, restoring the lower portion of Mesa Creek, planting native vegetation and improving access.
Western Goleta Slough Wetland Restoration Project	$2,734,312	Enhance and expand wetland habitat throughout the 34.41 acres owned by the Department of Fish and Wildlife in the Goleta Slough Ecological Reserve.
Prisoners Wetland and Lower Canada del Puerto Restoration	$775,069	Restore a coastal wetland and one mile of a stream corridor at Prisoners Harbor and Cañada del Puerto, the primary access point for Santa Cruz Island, Channel Islands National Park.
Colorado Lagoon Restoration	$13,335,683	Completed Phase I of the restoration of Colorado Lagoon, a 44-acre saltwater lagoon connected to Alamitos Bay. Phase I included dredging of the lagoon, stormwater diversion, bank stabilization, culvert cleaning, and native plantings.

Table 11- 2. Southern California Wetlands Recovery Project Completed Projects

Title (Local Lead)	Total Cost	Description
Las Flores Creek Restoration	$4,693,733	Restore approximately one half mile of Las Flores Creek in Malibu including exotic plant removal, bank stabilization and riparian habitat enhancement.
Malibu Lagoon Restoration and Enhancement	$6,596,695	Restore and enhance the ecological structure and function of Malibu Lagoon by increasing circulation and enhancing wetland habitat.
Restoration of Riparian Habitat in the Carlsbad Hydrologic Unit	$5,460,000	Remove non-native plant species, and restore riparian and select upland habitat areas in the Carlsbad Hydrologic Unit.
Land Acquisition		
Fenton Properties Acquisition	$3,000,000	Acquire approximately 100 acres of riparian habitat located along the Otay River from I-5 to highway 805
San Dieguito Lagoon Wetland Acquisition - Boudreau Total (San Dieguito River Park Joint Powers Authority)	$4,253,000	Acquire 75 acres within the floodplain of the San Dieguito River, located east of and immediately adjacent to the 400-acre San Dieguito Wetland Restoration Project.
San Elijo Lagoon Acquisition Program (San Elijo Lagoon Conservancy)	$3,717,000	Acquire up to 100 acres of property along the margins of San Elijo Lagoon
Buena Vista Creek Acquisition, Sherman Parcel (County of San Diego)	$9,500,000	Acquire approximately 133.8 acres of land along Buena Vista Creek.
Huntington Beach Wetlands -- Piccirelli Acquisition (Huntington Beach Wetlands Conservancy)	$1,693,066	Acquire 45 acres of the Huntington Beach wetlands located on either side of Magnolia Avenue
Huntington Beach Wetlands -- Edison Acquisition (Huntington Beach Wetlands Conservancy)	$945,000	Acquire 20 acre parcel of the Huntington Beach wetlands adjacent to power plant

Table 11- 2. Southern California Wetlands Recovery Project Completed Projects

Title (Local Lead)	Total Cost	Description
Los Cerritos Wetlands Complex - Bryant Acquisition (Los Cerritos Wetlands Authority)	$14,000,000	Acquire approximately 360 acres of the historic Los Cerritos Wetlands Complex, near the mouth of the San Gabriel River
Ballona Wetlands Acquisition (Dept. of Fish and Game)	$140,000,000	Acquire from willing sellers properties within the Ballona Wetlands complex
Upper Zuniga Road Acquisitions (Mountains Restoration Trust)	$1,020,000	Acquire approximately 120 acres in the upper Topanga watershed including Zuniga Pond, a man- made pond near Upper Zuniga Road in the Topanga Creek watershed to protect western pond turtle habitat, a state-listed species of special concern.
Tuna Canyon SEA Acquisition (Mountains Restoration Trust)	$1,625,000	Acquire approximately 417 acres of land at the lower end of Tuna Canyon to protect a perennial spring and well-developed riparian habitat
Cold Creek Riparian Acquisitions, Part 1 (Mountains Restoration Trust)	$1,950,000	Acquire 71.5 acres of upland and riparian habitat along Cold Creek, a tributary to Malibu Creek
Arroyo Hondo Ranch Acquisition (Land Trust of Santa Barbara County)	$6,176,000	Acquire 778 acres of riparian and grassland habitat along Arroyo Hondo Creek
Devereux Slough: Ocean Meadows Acquisition	$7,000,000	Acquired a 63-acre parcel in upper Devereux Slough for the purposes of preserving and restoring fish and wildlife habitat and open space.
Lower Los Angeles River Acquisitions	$20,000,000	Acquire properties adjacent to the lower Los Angeles River suitable for wetland and riparian restoration projects.

Table 11- 2. Southern California Wetlands Recovery Project Completed Projects

Title (Local Lead)	Total Cost	Description
San Diego River Land Conservation Program: Hanlon-Walker Acquisition	$2,144,500	Purchased approximately 105-acres and 1.3 miles of riparian habitat along the San Diego River at the Hanlon-Walker Property in the City of Santee.
Study		
Famosa Slough Culvert Extension and Retrofit Design (City of San Diego)	$82,500	Prepare feasibility study and design plans to reactivate an inoperable culvert between Famosa Channel and Famosa Slough to increase the tidal prism in the slough
San Elijo Lagoon Preliminary Sediment Quality Assessment (San Elijo Lagoon Conservancy)	$133,882	Perform preliminary assessment of sediment quality and depositional environment of San Elijo Lagoon as the first step in a feasibility analysis of proposed dredging activities
San Joaquin Marsh Enhancement - Phase II, Feasibility Study (University of California, Irvine)	$315,136	Prepare a feasibility study, conduct environmental review, consult with permitting agencies, and prepare final construction designs and contract documents for Phase II of San Joaquin Marsh restoration[1]
Big Canyon Creek Restoration Plan (Community Conservancy International)	$304,000	Prepare restoration plan for Big Canyon Creek, a tributary to Upper Newport Bay.
Huntington Beach Wetlands Restoration Plan (Huntington Beach Wetlands Conservancy)	$350,000	Prepare a comprehensive restoration plan for the entire Huntington Beach Wetlands ecosystems
Colorado Lagoon Restoration Project-Planning (City of Long Beach)	$200,000	Develop a restoration plan for Colorado Lagoon, a 44-acre saltwater lagoon.

Table 11- 2. Southern California Wetlands Recovery Project Completed Projects

Title (Local Lead)	Total Cost	Description
El Dorado Wetlands Restoration Plan (City of Long Beach)	$100,000	Prepare a plan to restore up to 20 acres of wetlands at the confluence of the San Gabriel River and Coyote Creek, adjacent to the El Dorado Nature Park
Hazard Park Wetlands Restoration Concept Plan (North East Trees)	$251,098	Conduct technical studies and detailed designs for restoration of one-half mile of creek corridor and enhancement of existing wetland habitat in Hazard Park in the City of Los Angeles
Solstice Creek Steelhead Enhancement Design Plans (RCD of the Santa Monica Mountains)	$122,000	Prepare engineering plans, permits, and environmental review documents for project to restore steelhead access to approximately 1.5 miles of Solstice Creek in the Santa Monica Mountains
Carpinteria Salt Marsh, Basin 1 Enhancement Plan (Land Trust of Santa Barbara County)	$100,000	Prepare an enhancement plan for restoration of Basin 1, approximately 23 acres
Mission Creek Museum Area Restoration Plan (Community Environmental Council)	$148,000	Prepare restoration plan for removal of invasive species, revegetation, implementation of storm water best management practices, and installation of interpretive trails and exhibits along Mission Creek.
Mission Creek Steelhead Passage Project	$1,394,000	Planning and design for a fish passage project along Mission Creek in Santa Barbara
DeForest-Dominguez Wetlands Restoration: Planning and Design	$1,050,000	Prepare a preliminary plan, environmental review document, and permits for creation of wetland and riparian habitat along approximately 1 mile of the east bank of the Los Angeles River.

Table 11- 2. Southern California Wetlands Recovery Project Completed Projects

Title (Local Lead)	Total Cost	Description
San Juan Hydrologic Unit - Non Native Species Eradication Plan	$2,500,000	Developed a comprehensive program to remove non-native, invasive species from the San Juan Hydrologic Unit.
Buena Vista Creek Watershed Plan	$374,500	Prepare a comprehensive watershed management plan for Buena Vista Creek.
Source: SCWRP (2010), SCWRP (2013)		

Table 11- 3. Southern California Wetlands Recovery Project Completed Projects: Imputed Unit Costs

Project	Calculated Unit Cost	Habitat
Restoration		
Upper Sulphur Creek Restoration Project	$49,500/acre	native wetland, transitional and scrub plant communities
Summerland/Greenwell Preserve Restoration	$91,000/acre	riparian
San Elijo Lagoon Exotics Removal	$30,400/acre	riparian
Malibu Creek Arundo Removal Project	$69,000/mile	riparian
Western Goleta Slough Wetland Restoration Project	$79,463/acre	Not specified
Colorado Lagoon Restoration	$303,084/acre	lagoon
Land Acquisition		
Fenton Properties Acquisition	$30,000/acre	riparian habitat
San Dieguito Lagoon Wetland Acquisition	$57,000/acre	floodplain
San Elijo Lagoon Acquisition Program	$37,000/acre	along lagoon margins
Buena Vista Creek Acquisition, Sherman Parcel	$71,000/acre	riparian area

Table 11- 3. Southern California Wetlands Recovery Project Completed Projects: Imputed Unit Costs

Project	Calculated Unit Cost	Habitat
Huntington Beach Wetlands – Piccirelli Acquisition	$37,624/acre	wetlands
Huntington Beach Wetlands – Edison Acquisition	$47,250/acre	wetlands
Los Cerritos Wetlands Complex – Bryant Acquisition	$38,889/acre	wetlands
Upper Zuniga Road Acquisitions	$8,500/acre	Not specified (includes manmade pond)
Tuna Canyon SEA Acquisition	$4,000/acre	Not specified
Cold Creek Riparian Acquisitions	$27,000/acre	upland and riparian
Arroyo Hondo Ranch Acquisition	$8,000/acre	riparian and grassland habitat
Devereux Slough: Ocean Meadows Acquisition	$111,111/acre	Not specified
Source: Imputed from total costs and acreage reported in SCWRP (2010) and SCWRP (2013).		

Should compensatory mitigation be in the form of the purchase of credits from a mitigation bank or in-lieu fee program, rates are highly variable. For example, estimates obtained by the State Water Board in 2007 (i.e., reflecting the market for credits in 2007) indicate that preservation credits at the Barry Jones Wetland Mitigation Banks were priced at $60,000 per acre whereas vernal pool preservation credits in Placer County sell for $300,000 per acre; the average price for credits pursuant to CWA section 404 was $110,000 per acre at the Kimball Island Mitigation Bank. However, some banks did not report rates. Active and pending banks and fee programs in California from which credits can be purchased vary by region and type of habitat being conserved.

These estimates are similar to those reported for California by ELI (2007). The Corps' Sacramento District's in-lieu fee program charged $110,000 per acre for seasonal wetland, seasonal marsh, perennial marsh, and open water credits; $134,000 per acre for riverine wetland credits; $151,000 per acre for riparian wetland credits; $171,000 per acre for vernal pool credits; and $183,000 per acre for shallow water marsh credits in April 2007. Another large mitigation bank in the district charged about $150,000 per acre for most types of wetland credits and about $300,000 per acre for vernal pool credits (ELI, 2007). The Corps obtained similarly varying estimates in a 2005 survey of District mitigation practices: per acre or per credit rates in the South Pacific Division were $400,000 for commercial mitigation banks and $125,000 for in-lieu fee programs (Martin et al., 2006).

Limitations and Uncertainties

There are a number of uncertainties associated with this analysis of current compliance, methods to achieve compliance, and the cost of those methods. For example, existing WDRs and section 401 certifications do not always contain sufficient information to assess compliance, or elaborate on certain evaluations (e.g., state that the applicant avoided impacts to wetlands rather than describe the manner in which this was done).

There is also little documentation of the cost of conducting alternatives analysis, or the resulting changes that may occur from selection of the LEDPA. Whether these methods are associated with opportunity costs, including costs from delays, or cost savings from avoiding wetland features, is site-and project specific. Finally, this analysis does not consider the benefits associated with considering alternative site designs in terms of protecting the functions of wetlands that may not be identified in the absence of the proposed Procedures.

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