Wetlands Management

	Goals	1993 CCMP
	Problem Statement	New 2007
	Existing Management Structure	New 2007
	Achievements	
	Challenges	
Objective WT-1	**Create a comprehensive Estuarywide wetlands management program**	Revised 2007
Action WT-1.1	Prepare Regional Wetlands Management Plan	1993 CCMP
Action WT-1.2	Encourage geographically focused efforts to protect wetlands	Revised 2007
Action WT-1.3	Protect wetland buffer areas; transitional habitats	New 2007
Action WT-1.4	Identify & protect & restore seasonal wetlands	New 2007
Action WT-1.5	Acquire & protect riparian areas	New 2007
Objective WT-2	**Improve the wetland regulatory system**	1993 CCMP
Action WT-2.1	Establish a comprehensive state wetlands program	Revised 2007
Action WT- 2.1.1	Establish state wetlands protection policies for the Estuary	1993 CCMP
A.	No net loss policy	Revised 2007
B.	Consistent definition and jurisdictional delineation	Revised 2007
C.	Wetland alteration policies	1993 CCMP
D.	Establish buffer areas	1993 CCMP
Action WT- 2.1.2	Investigate state assumption of 404	1993 CCMP
Action WT- 2.1.3	Establish implementation program to achieve wetlands protection	Revised 2007
Action WT-2.2	Increase enforcement efforts to curtail illegal wetland alteration	Revised 2007
Action WT-2.3	Develop & adopt uniform compensatory mitigation policies	Revised 2007
Action WT-2.4	Improve wetlands protection under CWA	1993 CCMP
Objective WT-3	**Protect wetlands and expand acquisition**	1993 CCMP
Action WT-3.1	Expand wetlands acquisition programs	Revised 2007
Action WT-3.2	Expand financial & technical assistance to landowners	1993 CCMP
Action WT-3.3	Encourage wetland protection bylaws	Revised 2007
Objective WT-4	**Expand wetland resource base**	
Action WT-4.1	Identify, convert, restore non-wetland to wetlands or riparian	Revised 2007
Action WT-4.2	Prevent non-native invasive species in wetland restoration projects	New 2007
Action WT-4.3	Identify, develop & implement success criteria for wetland restoration	New 2007
Objective WT-5	**Improve regional monitoring & tracking of restoration projects**	New 2007
Action WT-5.1	Develop a comprehensive wetlands regional monitoring program	New 2007
Action WT-5.1.1	Implement wetlands tracking, data management & coordination	New 2007
Action WT-5.2	Study effects of known stressors and emerging contaminants	New 2007
Action WT-5.3	Encourage academic institutions to study wetlands	New 2007

Wetlands Management
In the fourteen years since the original CCMP was adopted in 1993, interest in wetlands protection and restoration has continued to be a high priority of the environmental community, the general public, resource agencies, and elected officials. Progress has been made toward attaining each of the wetlands management objectives. In particular, public and private funding and a strong spirit of partnership have led to the unprecedented undertaking of many wetland restoration projects—both large and small—throughout the Estuary. Accompanying these efforts has been a push to improve regulatory programs and to better understand the effects and benefits of wetlands restoration and enhancement on the estuarine ecosystem. It is important to acknowledge and embrace our accomplishments during the past decade while recognizing the problems still facing the protection and restoration of wetlands.

Wetlands Management Goals:
The goals of the original CCMP remain our goals today:

- Protect and manage existing wetlands.
- Restore and enhance the ecological productivity and habitat values of wetlands.
- Expedite a significant increase in the quantity and quality of wetlands.
- Educate the public about the values of wetland resources.

Problem Statement
The original CCMP, drawing from several San Francisco Estuary Project technical documents, describes the myriad ways in which industrial, urban, and rural development have affected the Estuary's wetlands during the past one hundred-plus years. It notes that nearly ninety percent of the region's historical wetland acreage has been converted to non-wetland uses. Although the rate of wetland loss has declined markedly as a result of the federal Clean Water Act, Porter-Cologne Act, and McAteer-Petris Act, wetland losses continue. As was true when the CCMP was written, the most common types of projects that involve filling wetlands or shallow estuarine habitats include infrastructure improvements at ports and airports, roads and bridges, and residential and commercial developments.

The largest current threat to wetlands in the Estuary's immediate watershed is the expansion of urban and suburban development into agricultural areas and open space. This problem is most acute on lands adjacent to the North Bay and Suisun Marsh, and on the periphery of the Delta. The spread of development does not bode well for the ecosystems associated with the remaining non-tidal wetlands, especially seasonal wetlands and vernal pools.

Regardless of these ongoing habitat threats, efforts to restore and enhance the region's wetlands continue to garner widespread public support; this is reflected by the number and scale of wetland restoration projects throughout the Estuary. Today, scores of habitat

projects are in some stage of planning or implementation. These kinds of efforts will likely continue for years.

Existing Management Structure

The management entities described in the original CCMP—federal, state, and local agencies and non-governmental organizations—continue to implement the CCMP wetland actions. In 1995, the non-regulatory San Francisco Bay Joint Venture joined the management structure. Established to foster habitat restoration projects in partnership with other nonprofit groups and government agencies, the Joint Venture released its implementation strategy in 1991. This strategy called for acquiring, restoring, and enhancing many thousands of acres of habitats in and adjacent to San Francisco Bay and in the Bay's immediate watershed. Many efforts are underway to meet the strategy's goals.

The State Legislature established the California Coastal Conservancy's San Francisco Bay Program in 1998; this program has taken a leadership role in working with state and federal resource agencies on large habitat restoration projects in the North and South bays. Nonprofit organizations, such as the Audubon Societies, Bay Institute, Citizens Committee to Complete the Refuge, Save the Bay, and Sierra Club, continue to play a vital role in improving wetlands protection.

Achievements, 1993–2007

The CCMP has encouraged many major achievements in wetlands restoration and management in the Estuary. Progress has been made in each of the CCMP's four wetlands management objective areas: planning, regulatory, acquisition, and restoration/enhancement.

Although the objective to establish an Estuarywide wetlands management plan has not been attained, many components of such a plan have been developed. For example, the "Baylands Ecosystem Habitat Goals Report" ("Goals Report") was published in 1999 and serves as a guide for planning wetlands restoration projects in and around the baylands. The scientific consensus achieved in preparing the "Goals Report" revealed that habitat restoration in the Estuary should seek to ensure a diversity of habitat types for plants, fish, and wildlife. Although the "Goals Report" did not prioritize specific areas for acquisition and restoration, it laid the groundwork for several large-scale efforts that followed.

Based on the success of the "Goals Report," a Subtidal Habitat Goals Project is now underway to establish a comprehensive and long-term management vision for protection, restoration, and appropriate use of the subtidal habitats of San Francisco Bay. An Uplands Habitat Goals Project is also being developed using existing and new data supplemented by expert opinion to recommend the types, amounts, and distribution of upland habitats, linkages, compatible uses, and the ecological processes needed to sustain diverse and healthy communities of plant, fish, and wildlife resources in the nine-county Bay Area. In addition, several pilot efforts to develop goals for the region's streams and

riparian corridors have begun. Each of these planning efforts will help guide decisions regarding habitat protection and improvement well into the future.

Soon after the CCMP was adopted, the state developed a wetlands conservation policy. This policy aimed to implement several of the CCMP Wetlands Program management objectives: It increased support for wetland planning, improved administration of existing regulatory programs, strengthened landowner incentives to protect wetlands, gave more support for mitigation banking, and encouraged integration of wetlands policy and planning with other environmental and land use processes. A key impact of the policy was the development of a statewide wetlands inventory. Policy actions have been carried out with varying degrees of success.

Protecting wetlands must include a regulatory component, and several agencies responsible for regulating projects in wetlands have improved their regulatory programs. The San Francisco Bay Conservation and Development Commission updated its policies regarding San Francisco Bay ecology and related habitats, public access and wildlife compatibility, and mitigation. Based on intensive technical studies, the Commission modified relevant parts of the Bay Plan to ensure better protection of important Bay resources, including wetlands. It also increased its enforcement penalties to discourage unauthorized activities in and around the Bay.

The San Francisco Bay Regional Water Quality Control Board (Water Board) recently initiated an effort to improve its protection of streams and riparian areas. This effort should result in improved regulation of activities that adversely affect these aquatic resources. The Water Board made several regulatory changes to protect wetlands in its Basin Plan; this included adopting a no-net-loss wetlands policy, incorporating the approach to protect wetlands embodied in the federal Clean Water Act Section 404(b)(1) Guidelines, and developing a more protective wetlands definition in its Basin Plan to specifically include isolated waters. In addition, the Water Board updated its Basin Plan to emphasize wetland preservation and restoration through regional planning efforts such as the “Goals Report.”

To facilitate the submission of applications for projects involving activities in wetlands, several state and federal agencies adopted a joint permit application form. Known as the Joint Aquatic Resources Permit Application (JARPA), this form may be used by applicants seeking authorizations from the San Francisco Bay Conservation and Development Commission, the California Department of Fish and Game, the San Francisco Bay Regional Water Quality Control Board, and U.S. Army Corps of Engineers. It is based on a very successful similar effort by the State of Washington.

Wetlands mitigation banking provides compensatory mitigation for projects that fill wetlands. Banking has grown dramatically throughout the state during the past decade. There are now at least two dozen mitigation banks, mostly in the Central Valley, on thousands of acres in the Estuary’s watershed. Although a recent statewide study by the State Water Resources Control Board found several mitigation banks to be performing well, studies elsewhere have identified a host of problems associated with banks. As a

result, the use of mitigation banking continues to be controversial. To improve the development and performance of mitigation banks, the U.S. Army Corps of Engineers offices in Sacramento and San Francisco established interagency mitigation banking review teams in 2006. At the federal level, the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers are developing guidance to tighten controls on mitigation banking and in-lieu fee mitigation.

Efforts to restore wetland habitats in and around the Estuary are at an all-time high. Since the CCMP was adopted, projects large and small have been initiated throughout the Delta, in Suisun Marsh, along the fringes of San Pablo Bay, and in South Bay. To date, some 67,000 acres of projects have been undertaken. These range in size from just a few acres to some 15,000 acres of salt ponds in the South Bay. Above and beyond the South Bay salt pond restoration effort, local governments and non-governmental organizations are working on some seventy-five habitat projects at this time. Some of these projects will be completed in the span of several years; others will continue for decades.

Spartina alterniflora is a non-native cordgrass that has hybridized in the Bay with the native cordgrass, *Spartina foliosa. S. alterniflora* and its hybrids out-compete *S. foliosa* and have displaced habitats used by two endangered species, the salt marsh harvest mouse and the California clapper rail. A long-term eradication program—the Invasive Spartina Project (ISP)—is underway, with some dramatic results already achieved through the use of herbicide and manual methods. The goal of the ISP is to eradicate this non-native invasive species in the Bay over the next four years.

Many large wetland projects, completed or in progress, are utilizing dredged material from ports or navigation channels to hasten the development of tidal marsh vegetation. Examples include Hamilton Airfield, Bel Marin Keys, Sonoma Baylands, and Montezuma Wetlands. Given the declining volume of sediment expected to enter the Estuary in the future, large-scale restoration projects likely will continue to incorporate the use of dredged sediments. The Long Term Management Strategy for dredged material will continue to recommend the efficient use of dredged material in habitat projects and foster coordination among dredging interests and restoration planners.

The CALFED Bay-Delta Ecosystem Restoration Program has dedicated millions of dollars to restoring habitat in the Sacramento and San Joaquin river watersheds and the San Francisco Estuary with a focus on the Delta. The CALFED Bay-Delta Science Program is also helping policymakers and resource managers understand the complex ecosystems within this key part of the state. As the public has become more informed about the Estuary and how its health affects their quality of life, it has approved bonds for the benefit of wetland habitat acquisition and restoration. CALFED oversees many of the projects made possible by these bonds.

In an effort to better understand, manage, and successfully restore an estuary that has lost ninety percent of its original extent of wetlands, the National Oceanic and Atmospheric Administration established the San Francisco Bay National Estuarine Research Reserve in 2003. The National Estuarine Research Reserve System is a network of twenty-seven

reserves established for long-term research, education, and stewardship of the nation's estuaries. The San Francisco Bay National Estuarine Research Reserve is a partnership among the National Oceanic and Atmospheric Administration, San Francisco State University, California State Parks, Solano Land Trust, and the San Francisco Bay Conservation and Development Commission. The San Francisco Bay National Estuarine Research Reserve provides a platform for estuarine research, hosts workshops on estuarine ecology and related scientific topics, provides educational programs to students and the public, and maintains a monitoring program for water quality and weather measurements.

Monitoring throughout the entire Estuary is an important component of managing restoration and enhancement projects, and while there is a real need for a more coordinated, multi-agency approach, monitoring wetlands has historically been handled on a project-by-project basis. In order to track compliance with the no-net-loss policy and to ensure that wetlands are restored to their fullest function and value, there is a need to dedicate resources for appropriate and accurate monitoring of both wetlands acreage and health. During the past decade, the San Francisco Bay Regional Water Quality Control Board has fostered a regional wetlands monitoring program to improve communication on regional wetlands monitoring progress and techniques.

Methodologies have been developed to assess the conditions of local wetlands, including the Wetlands Ecological Assessment (WEA) and the California Rapid Assessment Methodology (CRAM); the latter method is being tested statewide to provide a uniform, standardized database, and both methods are still under review for their effectiveness. Substantial progress has also been made on creating databases to track wetlands projects and indicators of wetland health. These include the San Francisco Bay Joint Venture habitat project tracking system and the San Francisco Estuary Institute's Wetland Tracker. The San Francisco Bay Regional Water Quality Control Board has begun a pilot program to test the advantages of using the Estuary Institute's Wetland Tracker to manage the data generated by wetland mitigation projects and to compare conditions in mitigation wetlands with ambient wetlands in the region.

Challenges, 2007–2017

Many of the 1993 CCMP's wetlands management actions have been implemented; however, a substantial number of actions either have not been undertaken or have been implemented with minimal success. Attaining all of the CCMP objectives clearly will require additional work.

Some actions that were not undertaken include the development of a regional wetlands management plan, State assumption of the Section 404 program, and completion of the San Francisco Bay National Wildlife Refuge. Actions that have been implemented with minimal success include standardized monitoring protocols, mitigation project monitoring, increased enforcement, and efforts to improve mitigation banking. However, funding from the U.S. Environmental Protection Agency and the California Coastal Nonpoint Source Pollution Control Program should facilitate developing standardized monitoring protocols and mitigation project monitoring through tools such as the San

Francisco Estuary Institute's Wetland Tracker and the California Rapid Assessment Methodology, mentioned above.

While the rate of loss of tidal wetlands has declined sharply in recent decades, the loss of seasonal wetlands and streams continues. This loss is mostly a result of urban expansion and residential development on the agricultural lands and open spaces that surround the Estuary. The intense pressure to accommodate population growth, combined with the limitations of existing state and federal wetlands regulatory programs, make it difficult, in most instances, for the regulatory agencies to require complete avoidance of wetland fills. Many in the environmental community seeking better protections for wetlands and streams would like to see the agencies press harder for complete avoidance in instances where the avoided resources would continue to provide significant natural functions. Given projected population increases and associated land use changes, protecting the region's remaining wetlands and streams will be a challenge well into the future.

There is a continuing challenge to ensure that compensatory mitigation adequately offsets the impacts of authorized wetland fills. Many of the issues regarding mitigation apply both to individual mitigation projects and to mitigation banks; these include the ability to replace lost functions, use of out-of-kind mitigation, adequacy of performance measures, and lack of comprehensive monitoring. A chief concern with the use of mitigation banks is that it reduces efforts to avoid filling wetlands. Other frequently voiced concerns are the size and configuration of bank service areas and long-term bank site maintenance and protection. As regulatory agencies continue to use mitigation banks to offset wetlands losses, there will be a need for better dialogue among the agencies, bank developers, and environmental interests. More discussion on the improvements needed for properly functioning mitigation projects, including banks, is presented later in this chapter.

Recognizing the complexities of restoring and managing wetlands habitats and the need for coordination among large restoration projects, the CCMP recommended the preparation of a regional wetlands management plan. That management plan was never realized, and it is unlikely that it ever will be, given the existing practices of the resource and regulatory agencies, the way restoration projects are funded, and the entrepreneurial spirit that characterizes most restoration efforts. Fortunately, even without a formal plan in place, many of the recommended plan's most important components are being implemented in some fashion. As stated above, the "Goals Report" established a vision for wetland restoration in the San Francisco Bay region that is guiding local, state, and federal agencies responsible for habitat protection, as well as private and non-governmental organizations involved in habitat restoration.

A recent Supreme Court decision (Rapanos et ux., et al. v. United States) resulted in some ambiguity in the U.S. Environmental Protection Agency's and the U.S. Army Corps of Engineers' jurisdiction over certain waters of the United States, including isolated wetlands. At issue is whether ephemeral or intermittent streams provide a "significant nexus" to other waters of the United States to qualify as jurisdictional under the Clean Water Act. The U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers have been developing guidance to help clarify and interpret the Supreme

Court's decision. This issue points to the importance for the State to continue to improve its ability to regulate activities in these kinds of waters; accordingly, the State Water Resources Control Board and the Regional Water Boards have increased their efforts to protect isolated waters of the State.

Although there has been notable success in controlling *S. alterniflora*, this species and other non-native invasive species, such as the Quagga mussel, zebra mussel, water hyacinth, and pepper grass, to name a few, continue to have a very real potential to impact the Estuary's aquatic ecosystems. Our ability to control these and other non-native invasive species will largely depend on adequate funding for research, prevention, and control.

Mercury contamination in the Estuary's sediments presents a unique challenge to wetland restoration efforts. Sources of mercury include legacy mining, urban and non-urban runoff, wastewater treatment, and industry. Tidal wetlands provide an environment in which inorganic mercury in sediments may be transformed, in a process known as methylation, to a form that is toxic to animals and humans. While mercury in its inorganic form is not immediately harmful to living organisms, its presence in the environment poses a risk because it can be methylated at any time under certain conditions. The potential problem of mercury methylation in the Estuary may be most acute in the South Bay, where large quantities of mercury entered Bay sediments during the Gold Rush from the New Almaden mercury mine in the Guadalupe River watershed. As large areas of South Bay salt ponds are restored to tidal marsh, it will be important to monitor mercury concentrations carefully. As currently planned, restoration of the salt ponds is slated to proceed in tandem with a rigorous science program to assess mercury concentrations in sediments, water, fish, and wildlife. In addition to concerns in and around the Bay, methylation of mercury in managed wetlands is a concern throughout the Delta and upstream.

Another key issue that needs to be addressed is the development of a better understanding, through research and monitoring, of the effects of large-scale wetlands restoration on the estuarine ecosystem. There are also pressing needs to establish adequate protections for seasonal wetlands and riparian and uplands habitats, and to ensure that wetland mitigation banking is implemented on a watershed basis.

Finally, there is an issue of regional importance that received little attention in the original CCMP: global climate change. Scientists anticipate that rising concentrations of atmospheric greenhouse gases will lead to increased average global temperatures and rising sea levels. Coastal zones are particularly vulnerable to sea level rises, and the effects in the San Francisco Estuary may include inundation of existing tidal wetlands and other low-lying lands, intensification of flooding, and increased salinity. Combined with the projected alterations in the patterns of freshwater runoff, these changes likely will have an enormous effect on estuarine wetlands, other aquatic habitats, and the fish and wildlife resources they support. Human-induced climate change represents a new and very real challenge to wetlands and other resources, and the CCMP should establish the framework for addressing it.

Wetlands Actions

Objective WT-1

Create a comprehensive, Estuarywide wetlands management program. [Each of the subsequent objectives would be components of the program.]

ACTION WT-1.1 (1993 CCMP)
Prepare Regional Wetlands Management Plan(s).

Who: California Resources Agency (lead agency), California Environmental Protection Agency, California Department of Fish and Game, California Department of Water Resources, State Water Resources Control Board, Central Valley and San Francisco Bay Regional Water Quality Control Boards, California Coastal Conservancy, California State Lands Commission, San Francisco Bay Conservation and Development Commission, U.S. Fish and Wildlife Service, Natural Resources Conservation Commission, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, National Marine Fisheries Service, and local governments and special districts in coordination with the interested public

What: Prepare a Regional Wetlands Management Plan (the Plan) for San Francisco Bay and the Delta to protect, enhance, restore, and create wetlands in the Estuary. For the purposes of developing the Plan, establish geographical subregional components (e.g., the Plan may consider San Pablo Bay, the Delta, Suisun Marsh, South Bay, and others as planning units). The Plan should utilize to the fullest extent possible existing documents, such as the Concept Plans for Waterfowl Habitat Protection (San Francisco Bay and Delta), Central Valley Habitat Joint Venture, Suisun Marsh Protection Plan, and the San Francisco Bay Refuge Expansion Plan. Whenever possible, the enhancement of wildlife habitat should be a priority. Restoration and other wetland values and functions should also be considered, consistent with wildlife protection goals. In order to allow sufficient public input and review, development of the Plan should employ a public process similar to that used by the State Water Resources Control Board in development of the Regional Water Quality Control Boards' Basin Plans or by the San Francisco Bay Conservation and Development Commission in development of its Bay Plan. The policies and programs of the Plan should be incorporated into appropriate documents, such as the Regional Water Quality Control Boards' Basin Plans, the San Francisco Bay Conservation and Development Commission's Bay Plan, local General Plans, etc.

NOTE: In recognition of the fact that the regulation of jurisdictional wetlands directly affects the implementation of the Regional Wetlands Management Plan, recommendations regarding improvements to and modifications of the existing wetland regulatory system are offered in Objective WT-2 of this document. Those recommendations are intended to complement and augment the effectiveness of the Regional Wetlands Management Plan and indeed be an integral component of it. Together, the Plan and the improved regulatory system will enhance the effectiveness and efficiency of federal, state, and local efforts to protect wetlands.

The Regional Wetlands Management Plan should:

1) Consider all wetlands identified by the California Department of Fish and Game and by the National Wetlands Inventory maps and should identify buffer areas and stream environments;

2) Establish wetland habitat goals by identifying wetland habitat needs (e.g., determine the amounts, locations, and types of wetlands necessary to support wetland plant and animal communities);

3) Prioritize areas for acquisition and restoration;

4) Recommend wetland acquisition, enhancement, and restoration programs by public, nonprofit, and private institutions and organizations;

5) Recommend programs to protect and restore non-tidal wetlands surrounding the Bay, including diked historic baylands, abandoned salt ponds, and tributary streams that are hydrologically part of the Bay; and

6) Recommend specific guidance to all appropriate agencies, including local and county governments, to help in the development of local wetland protection programs.

When: 1993

Cost: $5,746,000 estimated total ($1,091,000 federal and $4,655,000 state)

ACTION WT-1.2 (Revised 2007)
Encourage geographically focused cooperative efforts to protect wetlands.

Who: California Resources Agency (lead agency), California Coastal Conservancy, San Francisco Bay Conservation and Development Commission, California Department of Fish and Game, California State Lands Commission, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Natural Resources Conservation Commission, San Francisco Bay Joint Venture, San Francisco Bay National Estuarine Research Reserve, local governments, landowners, and nonprofit organizations

What: Opportunities should be sought immediately and during development of the Regional Wetlands Management Program to protect wetland areas particularly threatened by loss. Such areas include, among others, San Pablo Bay wetlands, Delta wetlands, wetlands identified in the proposed expansion of the San Francisco Bay National Wildlife Refuge complex, and Suisun Marsh wetlands. Cooperative efforts of government agencies, landowners, and conservationists should be undertaken to create immediate opportunities for protection, acquisition, and restoration. These efforts will facilitate the implementation of a coordinated strategy for wetlands protection, acquisition, and restoration that should be contained in the Regional Wetlands Management Program.

When: Ongoing

Cost: $$$$$ (High cost based on land acquisition, restoration, and enhancement)

ACTION WT-1.3 (New 2007)
Provide and protect wetland transition habitats, buffer areas adjacent to wetlands, and functional connections between wetlands and related habitats.

Who: Local governments, U.S. Fish and Wildlife Service, California Department of Fish and Game, Regional Water Quality Control Boards, U.S. Army Corps of Engineers, San Francisco Bay Conservation and Development Commission, San Francisco Bay Joint Venture, San Francisco Bay National Estuarine Research Reserve, California Coastal Conservancy, and other agencies, organizations, and individuals approving and implementing wetland restoration projects

What: Transition and buffer zones are essential to maintain ecological functions of habitats and have intrinsic value as habitats for endangered, threatened, and other species. The transition areas between wetlands and adjacent uplands are essential components of wetland ecosystems. They are critically important for three distinct, but related, reasons:

1) As refuge habitat during times of high water in the marshes when endangered and other species must leave the marshes and find cover to protect them from avian and other predators, and as nesting and foraging habitat;

2) As buffer zones between the transition habitats and adjacent uplands to ameliorate impacts of adjacent human development and uses on the species dependent on the wetlands and adjacent transition zones; and

3) Functional connectivity for the wetland landscape, allowing the flow of nutrients, resources, and organisms between the open water and terrestrial habitats. These areas also filter runoff, thereby helping to improve water quality. They are often used for public access features and need to be carefully managed to protect natural habitat functions (see Aquatic Resources Action AR-5.1). Protection and establishment of these areas is an essential implementation mechanism of stream and wetland protection policies (see Land Use and Watershed Management Action LU-2.7).

The buffer width recommended by the “Baylands Ecosystem Habitat Goals Report” is 300 feet, but no narrower than one hundred feet. Additionally, those involved in wetland protection, mitigation, and restoration should:

- Recognize the importance of wetlands that have intact landscapes across habitat types.

- Include efforts to establish or maintain natural levels of connectivity between habitat types.

- Recognize the importance of including mosaics of wetland habitat types.

- Encourage connectivity between wetlands and uplands or open water habitats.

- Encourage studies of the effects of habitat connectivity on wildlife diversity, population health, and the larger ecosystem.

When: As projects are proposed for planning and implementation

Cost: $$$$$ (High cost based on land acquisition, restoration, and enhancement)

Performance Measures:
1) Percentage of projects that include buffer/transition zones. (Outcome)

2) Acreage designated and maintained as buffer/transition zones. (Output)

3) Percentage of projects that include monitoring for buffer/transition zones. (Output)

ACTION WT-1.4 (New 2007)
Identify and protect existing seasonal wetlands, and restore and create seasonal wetlands at appropriate sites.

Who: San Francisco Bay Joint Venture, U.S. Fish and Wildlife Service, California Department of Fish and Game, U.S. Geological Survey, San Francisco Estuary Institute, California Coastal Conservancy, California Wildlife Conservation Board, Natural Resources Conservation Service, San Francisco Bay Conservation and Development Commission, San Francisco Bay Regional Water Quality Control Board, San Francisco Bay National Estuarine Research Reserve, vector control agencies, landowners, non-governmental organizations, land trusts, and local governments

What:
- Appropriate agencies should protect seasonal wetlands from destruction.

- Appropriate agencies, land trusts, and nonprofits should work together to acquire threatened seasonal wetlands.

- Mapping of existing seasonal wetlands should be performed to adequately identify baseline acreage of this resource.

- Important functions of seasonal wetlands should be identified. Sites where restoration/creation is feasible should be identified; these sites should be acquired and restoration/creation should be undertaken.

- Update local government General Plans and ordinances to include seasonal wetland protection, restoration, acquisition, and creation.

When: Ongoing

Cost: $$$$$ (High cost based on land acquisition, restoration, and enhancement)

Performance Measures:
1) Map existing seasonal wetlands and identify those that could be restored to original function or where new wetlands could be created. (Output)

2) Percentage of local government General Plans and/or ordinances that include seasonal wetland protection, restoration, acquisition, and creation. (Output)

3) Percentage of seasonal wetlands protected, restored, enhanced, and/or created. (Outcome)

4) Acreage of seasonal wetlands protected, restored, enhanced, and/or created. (Outcome)

ACTION WT-1.5 (New 2007)
Riparian areas should be protected and acquired in recognition of the value that they have in protecting hydrologic, water quality, fish and wildlife habitats, and ecosystem functions.

Who: Regional Water Quality Control Boards, State Water Resources Control Board, California Department of Fish and Game, U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, San Francisco Bay National Estuarine Research Reserve, San Francisco Bay Conservation and Development Commission, California Coastal Conservancy, San Francisco Bay Joint Venture, local governments, and non-governmental organizations

What:
- Appropriate agencies should protect riparian areas from modification or destruction.
- Appropriate agencies, land trusts, and nonprofits should work together to acquire riparian areas.
- Mapping of existing riparian areas should be performed to adequately identify baseline acreage of this resource.
- Important functions of riparian areas should be identified. Sites where restoration/creation is feasible should be identified. Those sites should be acquired, and restoration/creation should be undertaken (see Pollution Prevention and Reduction Actions PO-4.1, PO-4.2, and PO-4.3).
- Update local government General Plans and ordinances to include riparian area protection, restoration, acquisition, and creation.

- Protect riparian areas by supporting the stream and wetlands system protection policies and plans under development (see Land Use and Watershed Management Action LU-2.7). Current items under consideration include:

  1) Addition of water quality enhancement and flood peak attenuation as potential beneficial uses of wetlands and other surface water bodies, such as floodplains, stream channels, and riparian areas, and language stating that wetlands often have the same functions as adjacent water bodies.

  2) Recognition of California's role in wetlands regulation irrespective of changes in federal wetlands jurisdiction.

  3) A description of how many wetlands will not exhibit all federal delineation criteria (i.e., hydrophytic vegetation, hydric soils, and hydrology) because of the seasonality and interannual variability of rainfall in California or because specific physical, chemical, biotic, or anthropogenic factors have hindered their development.

  4) An assertion that the Regional Water Board may exercise its independent judgment in determining both the size and functions of individual wetlands not identified with the federal delineation manual. The Regional Water Board will consider characteristics such as hydrophytic vegetation, hydric soils, and hydrology and may use more expansive identification/delineation methodologies as necessary to protect water quality and beneficial uses.

  5) Support incentives for updating local General Plans and ordinances to protect riparian and wetland systems.

When: Ongoing

Cost: $$$$$ (High cost based on land acquisition, restoration, and enhancement)

Performance Measures:
1) Map existing stream/riparian areas and identify those that could be restored to original function or protected. (Output)

2) Percentage of local government General Plans and/or ordinances that include stream/riparian area protection, acquisition, restoration, or enhancement. (Output)

3) Percentage of stream/riparian areas protected, restored, or enhanced. (Outcome)

4) Acreage of stream/riparian areas protected, restored, or enhanced. (Outcome)

Objective WT-2

Improve the wetland regulatory system.

ACTION WT-2.1 (Revised 2007)
Establish a comprehensive state wetlands program for the Estuary that, in addition, includes a coordinated regulatory and policy framework.

Who: San Francisco Bay Conservation and Development Commission, Central Valley Regional Water Quality Control Board, San Francisco Bay Regional Water Quality Control Board, Delta Protection Commission, California Resources Agency, California Department of Fish and Game, California Coastal Commission, California State Lands Commission, California Environmental Protection Agency, State Water Resources Control Board, local governments, special districts, and California Legislature

What: **WT-2.1.1:** ***Establish state wetlands protection policies for the Estuary.***
A. Adopt a "no net loss" policy. Establish a consistent no net loss policy by all state agencies to prevent any activity that will result in the loss of either wetland acreage or values on a project-by-project basis in the San Francisco Estuary or the land surrounding the Estuary. No net loss should first be accomplished by avoiding destruction or degradation of wetlands, if possible, by minimizing impacts, and by mitigation. This program should be no less protective of wetlands than any existing State wetlands policies in the Estuary.

B. Adopt consistent wetland definition and jurisdictional delineation methods. Adopt a standard definition for wetlands based on the broad scientific consensus that all wetlands possess certain general characteristics. Adopt a single corresponding jurisdictional delineation methodology to identify those wetlands in the field. Jurisdictional wetlands should be delineated in a manner that includes all ecological wetlands. This definition and delineation methodology should identify at a minimum all lands that fall under federal Clean Water Act Section 404 jurisdiction and should be used by all appropriate state and local regulatory agencies. Where the CWA Section 404/401 jurisdiction does not apply to waters of the State, such as isolated wetlands, groundwater wetlands, and other types of non-navigable waters, the Regional Water Quality Control Boards should use their authorities to protect all waters of the State under the Porter-Cologne Act.

The State Water Resources Control Board should exercise its independent authority under the Water Code in situations where there is a difference between the State and the U.S. Army Corps of Engineers, such as over a jurisdictional determination, or in instances where the U.S. Army Corps of Engineers may not have jurisdiction. The Water Code provides the State and Regional Water Quality Control Boards clear authority to regulate such isolated, non-navigable waters of the State, including wetlands.

One of the two following wetlands definitions is generally used:

Option 1: A general definition that reflects the three characteristics accepted by the scientific community as indicators of wetland ecology.

Wetlands are lands transitional between terrestrial and aquatic systems where the water table is usually at or near the surface or the land is covered by shallow water. For the

purposes of this classification, wetlands must have one or more of the following attributes: 1) at least periodically, the land supports predominantly hydrophytes; 2) the substrate is predominately undrained hydric soils; and 3) the substrate is non-soil that is saturated with water or covered by shallow water at some time during the growing season of each year.

Option 2: Current federal definition, modified to include sites that reflect California's unique wetland ecology.

Wetlands are those areas that are inundated or saturated by surface water 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. In addition, wetlands include: mudflats, sandflats, unvegetated seasonally ponded areas, vegetated shallows, sloughs, wet meadows, playa lakes, salt ponds, natural ponds, vernal pools, and riparian woodland and scrub.

Jurisdictional delineation methodology. Based on the adopted definition, a delineation method should be developed and adopted to allow consistent and accurate field identification of jurisdictional wetlands.

To more fully protect wetlands, state agencies with authority to do so should adopt a wetland definition that uses one parameter to determine jurisdictional wetlands. They should also develop a wetlands delineation approach to identify wetlands under this definition.

State agencies with authority to do so should provide consistent definitions for wetland habitat types throughout the state and Estuary. These definitions should consider the needs of specific biological species for habitats such as tidal marshes and seasonal wetlands. If possible, existing definitions should be used, such as those developed by the San Francisco Estuary Institute for the Wetland Tracker, which has been developed for statewide use with the collaboration of regulatory agencies, academic institutions, and the public. Whichever definition is used, cross-reference to standard terms used in other habitat classification systems should be provided.

C. Adopt wetland alteration policies. Adopt policies that require avoidance of fill and other alterations (e.g., removal of vegetation and draining) in wetlands. It is presumed that an alternative location exists for non-water-dependent projects unless otherwise demonstrated. Exceptions may be considered where the project proponent clearly demonstrates that no feasible alternative non-wetland location exists, or when the project is necessary for the health, safety, or welfare of the residents of the Bay-Delta Estuary region and no feasible non-wetland location exists. Fill should further be limited to projects where:

1) It is demonstrated that the public benefits outweigh the public detriment (e.g., minor filling for wildlife refuges or other wildlife purposes, or minor filling for public access

where existing access is inadequate and such access can be designed consistent with protection of sensitive wildlife and wetland habitat);

2) The fill is the minimum necessary to achieve the purpose of the project;

3) The fill minimizes harm to water circulation and quality, fertility of the marsh, and fish and wildlife resources;

4) The fill is engineered to reasonably withstand earthquakes and flooding;

5) In order to prevent a piecemeal approach, the fill project prevents future fill in wetlands at the site; and

6) The fill is limited to areas where ownership has been clearly established so that wetlands are not altered on property without legal authorization.

D. Establish sufficient buffer areas to protect wetlands from adjacent uses. Buffer zones adjacent to wetlands are necessary to provide for adequate transitional and refuge habitat between wetland and developed uses. Buffer zones should be of adequate size and quality to insulate the wetland, transition, and refuge habitat from adverse impacts of nearby developed areas. Buffer areas should be protected consistent with the legal rights of the property owners. (See WT-1.3 for details.)

WT-2.1.2: ***Investigate state assumption of Section 404 of the Clean Water Act.***

A. Study implications for state assumption of the Section 404 program. A study of state assumption of the Section 404 program should consider effectiveness, efficiency, and cost. Any assumption should maintain the appropriate federal role necessitated by interstate and international responsibilities and consider the establishment of an appeals program for review of state decisions.

B. If the study indicates that state assumption would improve resource protection, move toward state assumption of the Section 404 program.

C. Study methods to improve coordination of wetland regulation, including single agency authority for wetland alteration activities. The purpose of this would be to consolidate the permit process consistent with improved wetland protection.

D. If the study indicates that improved resource protection would result, move toward allowing consolidated or coordinated permit authority for wetland alteration activities. The purpose would be to consolidate the permit process consistent with improving wetland protection. For instance, agencies with other wetland-related permit activities (e.g., San Francisco Bay Conservation and Development Commission, Regional Water Quality Control Boards, the California Department of Fish and Game, and Delta agency could issue permits concurrently under the same application process or issue consistency determinations.

WT-2.1.3: ***Establish an implementation program to achieve wetlands protection policies.*** In order to improve wetland protection and reduce regulatory duplication, a uniform and coordinated program should be established that provides state oversight of locally implemented wetlands protection policies. Such a program may be modeled after the Suisun Marsh Protection Plan. The policies themselves (described in Actions WT-2.1, 2.2, and 2.3) should be adopted by the San Francisco Bay and Central Valley Regional Water Quality Control Boards, the San Francisco Bay Conservation and Development Commission, and the Delta Protection Commission. Authority and resources to implement these policies should be provided to local governments. In that manner, project sponsors will be informed of wetland protection requirements early in the application process, thereby minimizing uncertainty and delay. State oversight agencies will coordinate their actions with relevant federal agencies in a manner consistent with the policies and objectives described herein (Actions WT-2.1 through WT-2.4).

Fill gaps in existing wetland regulatory programs consistent with policies recommended above. Based on wetland resource needs, state policies and programs should be implemented to fill in gaps in existing wetland regulatory programs. In particular, this should include the following:

A. The State Water Resources Control Board and the San Francisco and Central Valley Regional Water Quality Control Boards should adopt policies and programs consistent with the Clean Water Act. The State Water Resources Control Board and/or San Francisco Bay and Central Valley Regional Water Quality Control Boards should be directed and allocated adequate resources to:

   - Clarify that wetlands are waters of the State and develop a program to protect wetland resources;
   - Adopt a definition of wetlands as specified in Action WT-2.1;
   - Apply the beneficial uses process developed by San Francisco Bay Regional Water Quality Control Board;
   - Develop scientifically based narrative water quality standards for wetlands;
   - Utilize Clean Water Act Section 401 authority to certify Section 404 permits;
   - Implement a wetlands anti-degradation policy;
   - Regulate removal of vegetation, draining, and hydrologic modifications to prevent loss of wetlands; and
   - Protect and restore the managed and unmanaged fresh/brackish wetlands of Suisun Marsh and Suisun Bay by providing sufficient Delta outflow and utilizing appropriate management techniques.

B. The McAteer-Petris Act should be amended to:

- Improve and strengthen the San Francisco Bay Conservation and Development Commission's mandate to protect wetland wildlife habitat values by: (a) making its wetland fill provisions consistent with those policies contained in WT-2.1.1; (b) clarifying that wetland wildlife habitat values are to be protected to the maximum extent feasible; and (c) providing the authority to protect buffer areas along the shoreline.

- Establish a coordinated regulatory system that relies on the preparation of local government wetland protection programs as part of the local land use planning process, with San Francisco Bay Conservation and Development Commission oversight, to protect non-tidal wetlands surrounding the Bay, including diked historic baylands and tributary streams that are hydrologically part of the Bay. The Suisun Marsh Preservation Act may be used as a model.

- Make the San Francisco Bay Conservation and Development Commission's jurisdiction and policies regarding salt ponds and managed wetlands consistent with other state and federal laws and policies on wetlands and other waters, as recommended herein.

- Provide the San Francisco Bay Conservation and Development Commission with authority over shoreline areas in order to protect fully priority use areas, protect wetland buffer areas, and provide for seismic safety and flood protection (e.g., to minimize the effects from spills from shoreline activities).

C. Establish a program to protect Delta wetlands. The State Legislature should establish authority to implement a Delta component of the Plan that would protect the tidal and non-tidal wetlands of the Sacramento-San Joaquin Delta.

Establishment of a Delta regional authority or augmentation of an existing agency's authority should be employed to accomplish this component. (This component should be modeled after the Suisun Marsh Protection Plan and similar to the San Francisco Bay Conservation and Development Commission component of the Wetlands Management Program.) The Delta Protection Commission should be given permitting authority for any development proposed in the Delta's primary or secondary zones.

D. Develop and implement local government wetland protection programs to implement the policies of the Bay, Basin, and Delta plans. Financial and other resources should be provided to local governments that, as part of the local land use planning process and with the assistance of state and federal agencies, develop local wetlands protection plans and ordinances that implement and are consistent with the programs described above. Adequate resources should be allocated to allow thorough and timely processing of applications at the local and oversight level. Real estate point-of-sale disclosure should be required to ensure that wetland protection laws are disclosed to buyers at time of sale of

property. Watershed management plans and actions to reduce pollutants in runoff should be main components of these programs. The establishment of local government wetland protection programs is consistent with related goals, objectives, and actions contained in the CCMP Land Use Management Program and the Pollution Prevention and Reduction Program.

When: Ongoing

Cost: $$$ (Agency staff costs)

ACTION WT-2.2 (Revised 2007)
Increase enforcement efforts to curtail illegal wetland alteration and to ensure compliance with permit conditions.

Who: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, California Environmental Protection Agency, U.S. Congress and California Legislature, San Francisco Bay and Central Valley Regional Water Quality Control Boards, San Francisco Bay Conservation and Development Commission, U.S. Fish and Wildlife Service, National Marine Fisheries Service, federal and state justice departments, and local governments

What: Provide increased resources, including funding, staff, and statutory authority, to improve curtailment of illegal wetland alteration and to ensure compliance with permit conditions. These resources should also be devoted to:

- Increasing state and federal staff to reduce permit processing time, consistent with wetland protection objectives contained herein.

- Improving enforcement techniques of state and federal agencies (e.g., streamline enforcement processes for administrative cease-and-desist orders or enforcement penalties); enforcing cease-and-desist orders in a timely fashion; increasing prosecutions by federal and state justice departments; monitoring permitted projects to ensure compliance; and issuing fines sufficient to compensate for lost resources and to deter future violations within the Estuary.

- Requiring and enforcing appropriate wetlands restoration and corrective measures in those cases where unauthorized wetlands alteration has taken place. Mitigation and permit monitoring should be improved to ensure that such measures are successful. When permit violations that damage wetlands occur or mitigation goals are not met, agencies should exercise their authority to suspend, revoke, or otherwise revise permits and require corrective measures.

- Authority should be provided to allow all fines and penalties collected by public agencies in connection with illegal wetland activities in the Estuary to be used for acquisition and restoration of wetlands within the San Francisco Estuary area.

- The U.S. Army Corps of Engineers should make available to the public on a regular basis a listing of outstanding cease-and-desist orders, a listing of enforcement cases, and a report on the status of approved mitigation projects.

- Enforcement outreach programs should be conducted by agencies with enforcement authorities in order to educate the public and other resource agencies about wetland enforcement programs. Information should be provided about how to report potential illegal activities to the appropriate authority.

- Providing adequate staff and funding for all of the above.

When: Ongoing

Cost: $$$ (Agency staff costs on an annual basis)

ACTION WT-2.3 (Revised 2007)
Develop and adopt uniform compensatory mitigation policies.

Who: California Resources Agency (lead agency), U.S. Environmental Protection Agency, U.S. Army Corps of Engineers, California Environmental Protection Agency, California Department of Fish and Game, California Department of Water Resources, State Water Resources Control Board, Central Valley and San Francisco Bay Regional Water Quality Control Boards, San Francisco Bay Conservation and Development Commission, U.S. Fish and Wildlife Service, National Marine Fisheries Service, San Francisco Bay National Estuarine Research Reserve, and local governments

What: Projects should be designed to avoid adverse environmental impacts to the Estuary's plants, fish, other aquatic organisms, wildlife, subtidal areas, tidal marshes, and tidal flats. Whenever adverse impacts cannot be avoided, they should be minimized to the greatest extent practicable. Finally, measures to compensate for unavoidable adverse impacts to the Estuary's natural resources should be required. Mitigation is not a substitute for meeting all regulatory requirements.

When avoidance is not possible, planning and implementation of wetlands compensatory mitigation projects should be based on local watershed plans (see Land Use and Watershed Management Action LU-2.6) to assure that wetland functions such as flood control, water quality improvement, and wildlife habitat are maintained or increased. If local watershed plans do not exist, mitigation should be in-kind and take place on site or as close as possible to the impact site. There may be some instances, such as with the San Francisco Bay Conservation and Development Commission, whose jurisdiction does not follow watershed boundaries, in which it may be infeasible to base mitigation decisions on a watershed plan.

Appropriate agencies should incorporate the following criteria concerning: A) compensatory mitigation, and B) mitigation banking into their regulatory procedures.

A. Compensatory Mitigation

1. Mitigation should create or restore wetlands at the site of the wetland alteration; if onsite mitigation is not feasible, then mitigation should create or restore new wetlands as close as possible. If watershed plans that incorporate wetlands considerations have been developed, mitigation may occur at locations within the watershed selected to optimize wetland functions (based on established watershed plans).

2. Develop watershed plans on a region-by-region basis that address wetlands regulatory parameters (see Land Use and Watershed Management Action LU-2.6 for the elements that should be included in a watershed plan and that are used to identify appropriate off-site, out-of-kind mitigation features).

3. Mitigation should be commensurate with adverse impacts of the wetland alteration and consist of providing similar functions and greater wetland acreage than those of the wetland area adversely affected.

4. Mitigation should include an area of adjacent upland habitat for wetland species that require such habitat, and some credit or recognition should be given for including it, but only after at least a 1:1 ratio of wetland mitigation is required for all projects.

5. If wetland mitigation is provided off-site, ratios should be higher than for on-site unless the mitigation complies with a local watershed plan, as described in Land Use Action LU-2.6.

6. Hydrologic storage and water quality improvement functions should be provided at the impacted site using grassy swales or other mechanisms, not at an off-site mitigation area.

7. Mitigation should, to the extent possible, be provided prior to or concurrently with those parts of the project causing the adverse impacts; mitigation should be carefully planned so as to ensure success, permanence, and long-term maintenance.

8. Mitigation sites should be permanently guaranteed as wetlands for open space and wildlife habitat purposes. The applicant should provide habitat maintenance and control of non-native invasive species (see Aquatic Resources Action AR-2.2).

9. All permitting agencies should develop minimum standardized requirements for compensatory mitigation plans and monitoring to ensure the success of mitigation projects. Requirements should be developed to address minimum reporting criteria, environmental assessments, and clearly defined goals and success criteria for the mitigation area, including a contingency plan in the event of partial or complete failure of the plan. (For appropriate site evaluation, planning, and monitoring, see WT-4.3.)

10. All mitigation projects should be monitored for at least five years. The monitoring period should be extended for projects that do not meet performance criteria. Mitigation projects should include a contingency plan to ensure their success, or provide means to

ensure that alternative appropriate measures are implemented if the identified mitigation cannot be modified to achieve success. Financial assurances, such as performance bonds or letters of credit, to cover the cost of mitigation actions based on the nature, extent, and duration of the impact and/or the risk of the mitigation plan not achieving the mitigation goals, may be necessary.

11. Mitigation sites should be tracked in geographic information systems (GIS), along with all known wetland and riparian sites, including restoration, creation, enhancement, preservation, and existing natural wetland sites. To allow efficient monitoring and enforcement, permittees should be required to provide GIS site data.

12. Wetland mitigation projects should be assessed with standardized rapid methods, such as the California Rapid Assessment Method (CRAM) or the Wetland Ecological Assessment (WEA) method, that can be conducted along with wetland jurisdictional delineations when mitigation projects are completed to determine overall compliance and ecological success.

B. Mitigation Banking

1. Projects qualifying for use of mitigation banks should be limited to small fills in order to ensure the availability of adequate mitigation sites for the small project sponsor;

2. Mitigation banks should be developed within the context of local watershed plans (see Land Use and Watershed Management Action LU-2.6);

3. Use of a mitigation bank should be authorized only after it is successfully functioning and providing in-kind habitat values; and

4. The mitigation bank should be used only if the fill project would otherwise meet criteria specified in the Clean Water Act Section 404(b)(1) Guidelines.

When: Ongoing

Cost: $$$ (Agency staff to develop policy and conduct project monitoring)

ACTION WT-2.4 (1993 CCMP)
Improve wetlands protection provided under the Clean Water Act.

Who: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Congress, and California Legislature

What: During reauthorization of the Clean Water Act, the law should be amended to:

1. Include explicit reference to wetlands in the Clean Water Act goals section (“ … Restore and maintain the chemical, physical, and biological integrity of the nation’s

waters, including wetlands …"); all appropriate provisions of the act should contribute to these goals.

2. Regulate wetland alteration activities, such as dredging, artificial flooding, and the placement of pile-supported and floating structures; the draining of wetlands and the destruction or removal of wetland vegetation should be regulated if such activities are not part of an ongoing farming operation; the draining of wetlands and the destruction or removal of wetland vegetation should be prohibited if the purpose is to achieve immediate or gradual conversion to a non-wetland type; and

3. Require the U.S. Army Corps of Engineers, in its decisions on permit applications, to follow the biological recommendations from the U.S. Fish and Wildlife Service, the National Marine Fisheries Service, and the California Department of Fish and Game unless: (a) it makes a finding that these recommendations are inconsistent with U.S. Army Corps of Engineers' legal requirements; or (b) alternatives to the agencies' recommendations chosen by the U.S. Army Corps of Engineers are consistent with the wetland alteration policies described in Action WT-2.1.

- Eliminate use in the Estuary of Nationwide Permits (NWPs) for filling of wetlands less than ten acres (NWP 26) and bank stabilization (NWP 13); if not feasible to eliminate their use, NWP 26 should have its upper acreage limit reduced from ten acres to one acre, and NWP 13 should have its upper lineal limit significantly reduced from 500 feet. Application of both these Nationwide Permits in California is known to have significant cumulative adverse impact.

The U.S. Army Corps of Engineers should undertake a study of all other Nationwide and Regional Permits and recommend elimination of any that are resulting in or are likely to result in individual and/or cumulative adverse impacts to wetland resources. For example, certain other Nationwide Permits (including the newly issued amendments to the Nationwide Permit program) may have cumulative adverse effects on wetland resources. In particular, these include NWP 12 (backfill and bedding for utility lines), NWP 14 (minor road crossings), and NWP 15 (U.S. Coast Guard-approved bridges), in addition to NWP 26 and NWP 13.

If Nationwide Permits are continued, the State Water Resources Control Board should decline to certify or should revoke NWP 13 and 26 and any others that have been demonstrated to have significant adverse impacts, thereby requiring individual permits for any activity in California that would otherwise be covered by such Nationwide Permits.

- The San Francisco and Sacramento Districts of the U.S. Army Corps of Engineers should regulate vernal pools by individual permits rather than Nationwide Permits or General Permits and continue master planning efforts with local governments to protect wetland resources.

- Where it is currently not doing so, the U.S. Army Corps of Engineers should recognize that Section 404 jurisdiction occurs where Section 10 jurisdiction does, in order to better protect and restore wetlands (and other waters) in diked historic bayland areas.

- Guidance should be developed for writers and reviewers of National Environmental Policy Act (NEPA)/California Environmental Quality Act (CEQA) documents specific to Estuary wetlands.

- NEPA and CEQA documents should better assess potential impacts to wetland areas and, in particular, should ensure that cumulative impacts are evaluated and that documents be prepared for any projects in a diked historic baylands that would preclude wetlands restoration.

When: 1993

Cost: $280,000 estimated total ($280,000 federal)

Objective WT-3

Protect existing wetlands using current, new, and expanded programs of wetland acquisition, easement agreements, and cooperative management systems.

ACTION WT-3.1 (Revised 2007)
Expand wetlands acquisition programs, or establish a new Estuary-specific wetlands acquisition program.

Who: U.S. Fish and Wildlife Service, California Department of Fish and Game, Wildlife Conservation Board, California State Lands Commission, California Coastal Conservancy, San Francisco Bay Joint Venture, and non-governmental organizations, such as Trust for Public Land and Nature Conservancy

What: Funding and level of effort would be increased for acquisition of priority wetland areas and associated habitat that are immediately threatened, provided that these areas are appropriate for restoration or are not otherwise protected.

- Increase federal funding for wetland acquisition by expanding allocations from the federal Land and Water Conservation Fund and through other federal funding mechanisms.

- Establish a program to purchase wetlands through land exchanges, and swaps. Authority and funding would be expanded for existing state programs for the acquisition of wetland areas, including the acquisition of non-wetland areas, for the purpose of conducting land exchanges to obtain title to wetland areas. State and federal lands would be inventoried to identify suitable and appropriate lands that could be used in land exchanges to secure wetland areas.

- Complete the expansion of the San Francisco Bay and San Pablo Bay National Wildlife Refuges and the Stone Lakes National Wildlife Refuge by acquiring (or gaining by other appropriate mechanisms) existing wetlands within the designated areas.

- Support the wetland benefits provided by salt pond operations. Should salt-making activities cease, salt ponds should be acquired and restored as wetland habitats.

- Assist landowners with establishing inheritance trusts for the protection of wetlands. Provide direct one-on-one assistance to individual landowners with the legal, financial, and tax aspects of establishing inheritance trusts for their wetland properties. Work through the Public Involvement and Education Program to disseminate information about this aspect of the program.

- Expand existing land acquisition programs to provide "Life Estate" acquisition services to wetland and associated lands, whereby landowners may continue to occupy or utilize the lands during their lifetime (within established agreements to maintain the wetland values).

- Encourage landowners to sell conservation easements.

When: 1993

Cost: $$$$$ (High cost based on land acquisition, restoration, and/or enhancement)

ACTION WT-3.2 (1993 CCMP)
Expand existing private, state, and federal financial and technical assistance programs to individual landowners.

Who: U.S. Army Corps of Engineers, U.S. Fish and Wildlife Service, California Secretary of Resources, California Department of Fish and Game, University of California Agriculture and Natural Resources Cooperative Extension, California State Lands Commission, California Wildlife Conservation Board, San Francisco Bay Conservation and Development Commission, and private landowners

What: Various incentives, including economic supports, subsidies, tax breaks, conservation easements, grants, project funding, regulatory permit conditions, and others, should be provided to landowners to implement measures or initiate practices to protect and enhance wetlands acreage and values. Emphasis needs to be placed on incentives to the agricultural community, particularly in the North Bay and Delta, where opportunities for large-scale benefits appear greatest.

- The U.S. Department of Agriculture should immediately provide funds for the Wetlands Reserve Program (WRP) authorized by the Food, Agriculture, Conservation, and Trade Act of 1990. The Wetlands Reserve Program retains private ownership but requires a recorded thirty-year or perpetual easement for restoration of

wetlands on prior converted cropland and farmed wetlands and includes protection of adjoining wetlands.

- Establish a state task force of experts, landowners, and interested members of the public to develop an improved program to provide property tax, income tax, or other tax incentives that would encourage landowners to preserve wetlands in perpetuity.

- Information should be distributed to landowners concerning wetlands identification, values, and regulation. In addition, information should be provided by state and federal fish and wildlife agencies regarding management methods landowners could use to maintain or enhance the wetland resources they own.

- Special efforts would be made to encourage agricultural practices, particularly on farmed wetlands in the Delta, that enhance habitat and associated values.

- Improve management of wetlands owned and managed by government agencies through technical assistance. Provide direct technical assistance to each of the local, regional, state, and federal agencies that own wetland areas in order to protect the wetland values.

- Provide increased direct one-on-one assistance to individual landowners with the necessary legal, financial, and tax programs to establish voluntary landowner-initiated conservation easements for the perpetual protection of wetlands and associated lands. Such easements could include continued private ownership of the wetlands, whereby such lands would also remain on the local property tax base. Information about the increased level of service will be distributed to the greater public.

- The U.S. Congress should amend the Wetland Conservation (Swamp buster) provision of the Food Security Act of 1985 and the Food, Agriculture, Conservation, and Trade Act of 1990 to provide disincentives (loss of U.S. Department of Agriculture benefits) for wetland conversions for any agricultural crop instead of just commodity crops (any annually tilled planted crops; excluding perennial crops, orchards, and vineyards).

- Use the Public Involvement and Education Program as an organizing vehicle to bring citizens together in volunteer and other projects to provide services to local, regional, state, and federal agencies in the management of wetland areas. Projects could include restoration efforts, inventories, and construction of facilities, such as fencing or public access points. The Public Involvement Program will also be the vehicle through which information is disseminated about the services available to private landowners and investors to assist with the preservation and restoration of wetlands.

When: 1993

Cost: $62,720,000 estimated total ($61.2 million federal and $1,520,000 state)

ACTION WT-3.3 (Revised 2007)
Encourage wetland protection bylaws.

Who: U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Fish and Game, San Francisco Bay Conservation and Development Commission, San Francisco Bay National Estuarine Research Reserve, San Francisco Bay Joint Venture, and University of California Agriculture and Natural Resources Cooperative Extension

What: A sample or model text of language would be prepared and made available to organizations, such as homeowners associations, hunting clubs, special districts (e.g., mosquito abatement), etc., through which such organizations could voluntarily modify their bylaws to incorporate improved management and protection of the wetlands under their jurisdiction.

When: Ongoing

Cost: $ (Agency staff costs on a one-time basis)

Objective WT-4

Expand the wetland resource base by restoring, enhancing, and creating wetland resources using a variety of approaches.

ACTION WT-4.1 (Revised 2007)
Identify potential and existing wetlands/riparian areas for habitat expansion and creation. Protect through acquisition, easement, or private land stewardship those non-wetland areas suitable for wetland creation.

Who: U.S. Fish and Wildlife Service, California Department of Fish and Game, California Legislature, California Coastal Conservancy, San Francisco Bay Joint Venture, San Francisco Bay National Estuarine Research Reserve, California Wildlife Conservation Board, landowners, land trusts and nonprofit organizations, open space districts, resource conservation districts, and other special districts

What:

- The California Legislature should appropriate funds to the California Wildlife Conservation Board and the California Coastal Conservancy to acquire and restore wetlands and riparian habitats that no longer function.

- Voter-approved funding through bonds and special assessments should be allocated by the California Coastal Conservancy and special districts to create wetlands at identified sites and to acquire and restore wetlands and riparian habitats that no longer function.

- Resource conservation districts and private landowners should take advantage of

incentives to create new wetlands and restore wetland and riparian areas that no longer function.

- Historic wetland sites no longer functioning as wetlands should be purchased or in other ways protected and restored to maximize habitat and other associated values.

- Large-scale restoration of wetland habitats in the South Bay should proceed as rapidly as possible.

- Complete expansion and habitat restoration of Don Edwards, San Pablo Bay, and Stone Lakes National Wildlife Refuges.

When: Ongoing

Cost: $$$$$ (High cost based on land acquisition, restoration, and/or enhancement)

Performance Measures:
1) Amount of funding identified or appropriated by bonds or through legislation to increase acreage of restored or created wetlands. (Output)

2) Acres of wetlands and riparian habitats acquired, improved, enhanced, or restored on private land. (Outcome)

3) Acres of wetlands and riparian habitats acquired, improved, enhanced, or restored on public land. (Outcome)

ACTION WT-4.2 (New 2007)
Prevent the introduction and establishment of non-native invasive plant species in wetland restoration and mitigation projects.

Who: California Department of Fish and Game, San Francisco Bay Conservation and Development Commission, U.S. Fish and Wildlife Service, National Marine Fisheries Service, California Department of Food and Agriculture, State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, California Coastal Conservancy, San Francisco Bay National Estuarine Research Reserve, private nonprofit organizations, and public trusts

What: Non-native invasive plant species should not be used in habitat or wetland restoration and mitigation projects. All approved mitigation and restoration projects should include a program for periodic site monitoring for non-native invasive plant species and a program for control and, if appropriate and feasible, eradication should an introduction occur. The use of non-native invasive plant species in shoreline landscape improvements should be avoided where a potential exists for non-native plants to spread into the Bay, other waterways, or transition zones between tidal and upland habitats. Programs and outreach materials should be developed to educate stakeholders

(individuals and groups involved in wetland monitoring, restoration, and mitigation) about the impacts of species introductions and what they can do to prevent them.

All actions regarding non-native invasive species monitoring, research, control, eradication, and education should be conducted in consultation with the California Aquatic Invasive Species Management Plan, the California Noxious and Invasive Weed Action Plan, the California Invasive Plant Inventory, and the San Francisco Bay Regional Water Quality Control Board's list of Invasive Non-native Plants to Avoid in Mitigation and Restoration Sites. Upon completion of wetland mitigation projects, wetland assessments should determine permit compliance and overall wetland function, including the impact of non-native invasive species. (See also Aquatic Resources Actions AR-2.1, AR-2.2, AR-2.3, and AR-2.4.)

When: Immediately

Cost: $$$ (Cost based on the number of species being addressed, extent of spread, and eradication methods. Cost for control at mitigation sites to be borne by permittees.)

Performance Measures:
1) Finalize list of non-native invasive species that should not be used in wetland/habitat restoration projects or shoreline landscape improvements. (Output)

2) Percentage of permits issued with conditions to control non-native invasive species. (Output)

3) Percentage of wetland mitigation and restoration project sites with a decrease in non-native invasive species as determined by wetland assessments for permit compliance and wetland function. (Outcome)

4) Acres of wetland projects where non-native invasive species are eradicated or controlled. (Outcome)

5) Number of non-native invasive species eradicated or controlled at project sites where biologically and financially feasible. (Outcome)

ACTION WT-4.3 (New 2007)
Identify, develop, and implement success criteria for wetland restoration and mitigation projects.

Who: State Water Resources Control Board, San Francisco Bay Conservation and Development Commission, San Francisco Bay Regional Water Quality Control Board, U.S. Army Corps of Engineers, California Department of Fish and Game, California Coastal Conservancy, U.S. Fish and Wildlife Service, National Marine Fisheries Service, San Francisco Estuary Institute, San Francisco Bay Joint Venture, San Francisco Bay National Estuarine Research Reserve, CALFED Science Program, universities, water districts, flood control districts, non-governmental organizations, and public trusts

What: Wetland restoration or mitigation projects should include clear and specific long-term and short-term biological and physical goals, success criteria, and a monitoring program to assess the progress of the project. Design and evaluation of the project should include, where appropriate, an analysis of: (a) the effects of sea level rise; (b) the impact of the project on the Bay's sediment budget; (c) localized sediment erosion and accretion; (d) the role of tidal flows; (e) potential non-native invasive species introduction, spread, and their control; (f) rates of colonization by vegetation; (g) use of the site by fish, other aquatic organisms, and wildlife; (h) site characterization; and (i) mercury methylation in wetland sediments. If success criteria are not met for restoration and mitigation projects, appropriate corrective measures should be taken.

When: Immediately

Cost: $$ (Agency staff time)

Performance Measures:
Percentage of wetland restoration and or mitigation projects that meet one or more of the following:

1) Include short-term and long-term biological and physical goals as part of their permits. (Output)

2) Include success criteria as part of their permits. (Output)

3) Include a monitoring program as part of their permits. (Output)

4) Include design and evaluation elements as described in (a) thru (i) above as part of their permits. (Output)

5) Are assessed for permit compliance and ecological function with an approved wetland assessment method in addition to a jurisdictional delineation. (Output)

6) Have been corrected when appropriate. (Output)

7) Address and minimize the likelihood of creating a methylating environment. (Output)

Objective WT-5

Improve regional monitoring and tracking of wetland restoration and mitigation projects and encourage research on wetland issues.

ACTION WT-5.1 (New 2007)
Develop a comprehensive Wetlands Regional Monitoring Program for the Bay and the Delta.

Who: U.S. Environmental Protection Agency, National Marine Fisheries Service, U.S. Fish and Wildlife Service, California Coastal Conservancy, California Department of Fish and Game, San Francisco Bay Conservation and Development Commission, Regional Water Quality Control Boards, San Francisco Estuary Institute, Joint Ventures, and San Francisco Bay National Estuarine Research Reserve

What: To accurately and efficiently measure ecosystem health, develop a Wetlands Regional Monitoring Program (WRMP) that will establish wetland indicators and standardized methods for the collection of baseline data at both natural wetland reference sites and restored/created/enhanced sites, including mitigation sites. The Wetlands Regional Monitoring Program should be based on the San Francisco Estuary Institute's Regional Monitoring Program for Water Quality model. It should provide an inventory of all wetland and riparian habitats in San Francisco Bay and the Delta, a GIS database for locating and tracking all relevant information about wetland projects, and standardized methods for assessing wetland condition, such as the California Rapid Assessment Methodology (CRAM) or the Wetlands Ecological Assessment (WEA).

The Wetlands Regional Monitoring Program should build on existing efforts, such as the Environmental Monitoring and Assessment Program, Bay Area Integrated Regional Water Management Plan, the Joint Ventures' and San Francisco Estuary Institute's wetland trackers, San Francisco Estuary Institute's existing estuarine wetlands monitoring protocols, and other appropriate programs. The regional program should be consistent with the State Water Resources Control Board's Surface Water Ambient Monitoring Program and the U.S. Environmental Protection Agency's Application of Elements of a State Water Monitoring and Assessment Program for Wetlands.

When: Immediately

Cost: $$$ (Cost at lower end of $10 million range because some work is already completed)

Performance Measures:
1) Draft an interagency memorandum of understanding (MOU) that would implement a Regional Wetlands Monitoring Program. (Output)

2) Amount of funding available for Regional Wetlands Monitoring Program. (Output)

3) Develop final Regional Wetlands Monitoring Program. (Output)

ACTION WT-5.1.1: ***Implement wetland project tracking, data management, and coordination.***

Who: State Water Resources Control Board, San Francisco Bay Conservation and Development Commission, Regional Water Quality Control Boards, U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, California Department of Fish and Game, U.S. Fish and Wildlife Service, National Marine Fisheries Service, San Francisco

Estuary Institute, San Francisco Bay Joint Venture, CALFED Science Program, California Coastal Conservancy, and San Francisco Bay National Estuarine Research Reserve

What: As part of implementing the Regional Wetlands Monitoring Program, agencies responsible for regulating wetlands should collect and share data and establish a tracking system for the Bay and Delta (or statewide), coordinating existing systems, with the following features:

1) The ability to incorporate all the individual agency permits in addition to the large regulatory documents (e.g., mitigation plans, monitoring reports).

2) A GIS capability.

3) The ability for permit information to be submitted electronically by the permit applicant.

4) Use of consistent habitat definitions for wetland and riparian losses and gains.

5) Use of consistent formats for tracking locations, performance criteria, monitoring elements, and final assessments of permit compliance and wetland condition.

6) Management by a state or non-governmental agency or organization with the capability to do so.

7) Accessibility to the public.

When: Immediately

Cost: $$ (Per agency with permit database)

Performance Measures:
1) Percentage of wetland management and related agencies/organizations sharing compatible data. (Output)

2) Establish monitoring network with features identified in Action WT-5.1.1. (Output)

3) Percentage of sites monitored and analyzed. (Output)

ACTION WT-5.2 (New 2007)
Study the effects of known stressors and emerging contaminants on the Estuary's wetlands, including non-native invasive species, sea level rise, global climate change, and chemical contamination from mercury and other pollutants (e.g., PCBs, DDT, chlordane, dieldrin, and dioxin).

Who: U.S. Army Corps of Engineers, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Geological Survey, CALFED Science Program, California Department of Fish and Game, State Water Resources Control Board, San Francisco Bay Regional Water Quality Control Board, San Francisco Bay Conservation and Development Commission, Bay Area Air Quality Management District, San Francisco Estuary Institute, California Coastal Conservancy, Bay Institute, San Francisco Bay National Estuarine Research Reserve, and universities

What: Identify, study, and recommend actions to address known and emerging stressors on tidal or seasonal wetland restoration and mitigation projects. There are a variety of impacts from global climate change that are anticipated to affect the coastal zones; for example, research will be needed to understand the effects of sea level rise, wetlands inundation, intensification of flooding and increased salinity, to name a few. Focused studies can help identify whether trends in other coastal areas will also affect the Bay-Delta wetlands system. (See also Wildlife Action WL-4.7 and Pollution Prevention and Reduction Action PO-2.3.)

When: Ongoing

Cost: $$$$ (Depends on scope and duration of studies)

Performance Measure:
Number of studies with recommendations for actions to minimize effects of stressors. (Output)

ACTION WT-5.3 (New 2007)
Encourage local academic institutions to study wetlands and to communicate their findings.

Who: University of California (Berkeley, Davis, Santa Cruz), California State University (East Bay, Sonoma State, San Francisco State, San Jose State, Sacramento State), private colleges (Stanford University, St. Mary's University, University of San Francisco), community colleges, and San Francisco Bay National Estuarine Research Reserve

What: There is a substantial need for additional research on San Francisco Bay-Delta wetland issues. Local academic institutions need to pursue research on wetland issues, which can aid in management decisions for Bay-Delta natural resources.

When: Immediately

Cost: $$ (Costs on a per-study basis; funded with grants)

Performance Measures:
1) Number of scientific studies undertaken by local academic institutions on Bay-Delta wetland issues. (Output)

2) Number of scientific conferences, seminars, or workshops organized on Bay-Delta wetland issues by local academic institutions. (Output)

3) Number of peer-reviewed journal articles or other publications. (Output)