San Francisco Estuary
Wetlands Regional Monitoring Program Plan

Executive Summary

Mission Statement

The mission of the Wetlands Regional Monitoring Program (WRMP) is to provide the scientific understanding necessary to protect, create, restore, and enhance wetlands of the San Francisco Bay Region, through objective and cost-effective monitoring, research, and communication.

Geographic Scope

The geographic scope of the WRMP is the entire San Francisco Estuary plus the watersheds that drain to the Estuary within the nine-county San Francisco Bay Area. The WRMP will initially focus on the tidal baylands of the Estuary. The baylands consist of the mudflats, tidal marshes, diked historical tidal marshes, and other lands that would be tidal in the absence of existing levees, sea walls, tide gates, and other water control structures. The tidal baylands consist of the mudflats and tidal marshes.

Why the WRMP Is Needed

Wetland managers and the concerned public in the Bay Area have a long history in wetland conservation and protection. Their interest is expressed in many questions about the overall status and trends in wetland health and about the location and performance of wetland restoration and mitigation projects.

These questions cannot be answered at this time because the ambient condition of wetlands is not regularly assessed, the restoration and mitigation projects are monitored in disparate ways, there is little assurance of data quality, and the results are not readily available. Simply stated, there is no public measure of the environmental costs or benefits of most wetland management actions.

The WRMP was formed to define the basic information needs for managing wetlands, to develop a scientific framework with standard methods for monitoring wetlands and for interpreting the results, and to regularly report the findings to the public.

History of the WRMP

A plan for the WRMP was prepared by the San Francisco Estuary Institute for the USEPA in 1995. That plan called for the Wetlands Habitat Goals Project as the first step toward the WRMP. In 1999 and 2000, after the habitat goals were established, a multi-agency Steering Committee and core group of scientific Focus Teams were formed to continue working on the WRMP. During 2000 and 2001, additional Focus Teams were formed, existing monitoring methods were reviewed, management questions were compiled and prioritized, and a scientific framework was drafted. Also during 2001, the

Focus Teams selected indicators and drafted protocols for data collection. Additional funding was received, and the framework was finalized. In 2002, the highest priority protocols were completed and compiled with the science framework to produce this version 1 WRMP Plan.

Science Framework

The science framework consists of conceptual models of tidal marsh form and function to guide the monitoring design. The models are briefly summarized below.

- Estuaries exist between marine and riverine systems. Their defining feature is a salinity gradient from saline to freshwater conditions. The San Francisco Estuary extends between the Gulf of the Farallones and the inland Delta, but there are secondary gradients along each tributary river and stream. These secondary estuaries significantly influence the overall ecology of the San Francisco Estuary.

- The intertidal zone of the Estuary is transitional between the rest of the Estuary and the surrounding uplands. Environmental conditions vary from mostly estuarine to mostly terrestrial along the elevation gradient from the bottom to the top of the intertidal zone.

- The intertidal zone consists of tidal flats and tidal marshes. Tidal flats exist between zero tide height and the marsh foreshore. The marshes exist between the tidal flats and the uplands. Tidal flats and marshes consist of broad planes between channels large and small that form dendritic drainage networks. Channel banks in tidal marshes are long extensions of the foreshore. The shoreline is fractal in plan view; shorter yardsticks yield longer measurements of total shoreline length.

- The creation and natural maintenance of tidal wetlands depend on regular supplies of water and sediment, the former to submerge the land, and the latter to prevent the land from being too deeply submerged.

- In general, climate, geology, and land use control supplies of water and sediment, which in turn control vegetation, which in turn affects the distribution and abundance of animals. Land use strongly influences the status and trends of intertidal ecosystems.

- The geomorphology of the intertidal zone creates a dynamic template for bio-geo-chemical and ecological processes, as mediated by vegetation. Physical factors and communities of plants and animals vary predictably along the estuarine gradient between marshes, along the elevation gradients within marshes, and along the gradients of environmental stress created by land use.

- Successful adaptive management of the intertidal zone requires regular inputs of empirical data for indicators of environmental response to management actions.

WRMP Management Structure

The WRMP is designed as the monitoring organization of the San Francisco Bay Area Wetlands Restoration Program. The proposed management structure of the WRMP calls for a Steering Committee and Science Review Group to provide policy and science oversight. The daily operations of the WRMP would be managed by a Science Coordinator, Program Manager, Administrative Assistant, and Data Managers. The WRMP would contract with scientific Focus Teams for data collection and analysis. The Focus Teams, Science Coordinator, Program Manager, and Science Review Group would share responsibility for interpretation and reporting of technical findings, subject to independent peer review. The Regional Monitoring Program for Trace Substances is the model for this management structure.

Technical Components and Products

The WRMP will include four major technical components: wetland tracking, project monitoring, special studies, and an information system.

- A 3-tiered approach to wetland tracking will (1) track the overall distribution and abundance of wetlands; (2) assess the status and trends in wetland condition using rapid assessment of random samples of wetland sites; and (3) intensive monitoring of reference sites along stressor gradients to calibrate the rapid assessment methods.

- There will be a common set of indicators for monitoring ambient conditions and for monitoring the condition of wetland projects, such that projects can be compared one to another and over time, and so that projects can be assessed in the context of ambient variability. Project monitoring through the WRMP will also involve the review of site-specific monitoring plans and results.

- Special studies will be carefully focused to improve the interpretation of monitoring results.

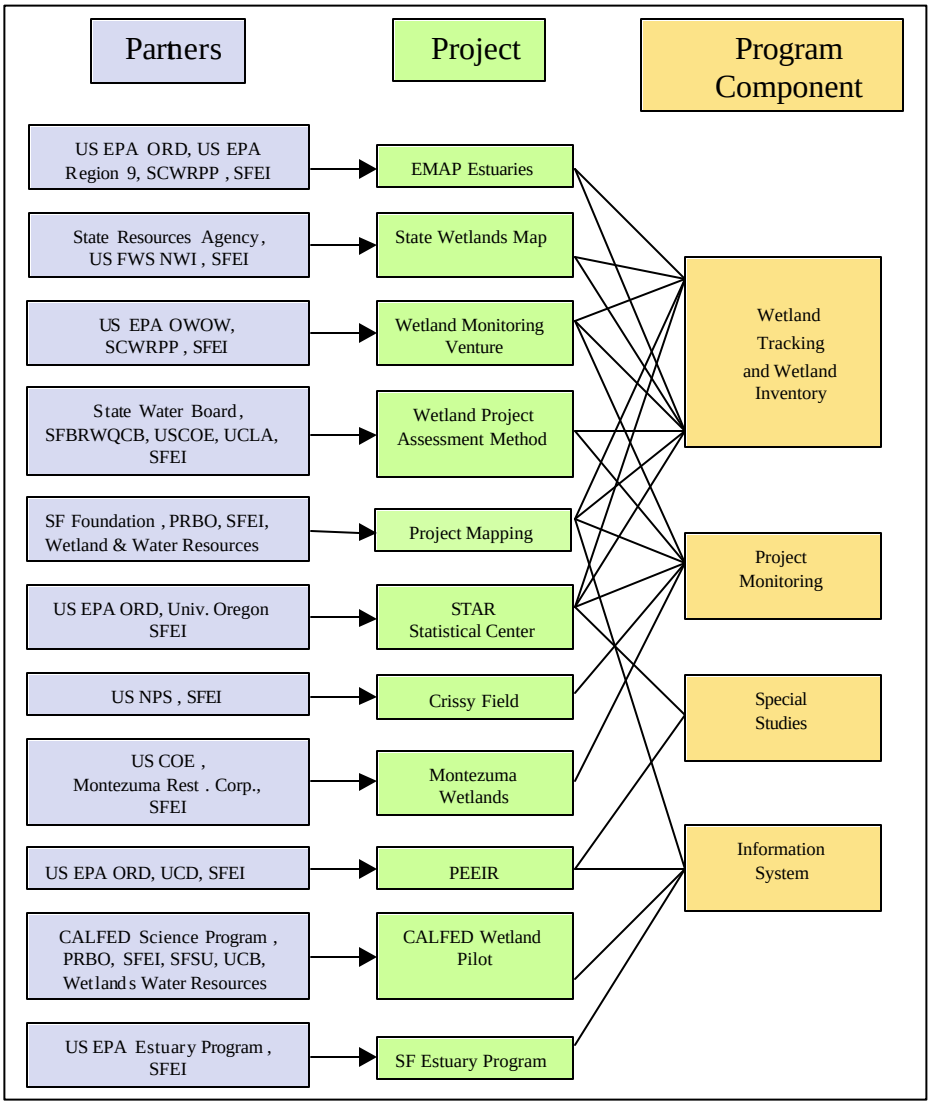
- An information system is being developed for data sharing among WRMP collaborators, and for public access to qualified data sets and finalized reports.

What to Measure

The Focus Teams have nominated indicators for detailed wetland tracking and for project monitoring. These indicators relate directly to the management questions and are consistent with the science framework. Data collection protocols have been prepared for some of the most basic candidate indicators: habitat distribution and abundance, tidal elevation, sedimentation, contamination, plant community structure, status of protected species, and avian support. Additional protocols will be developed in the future.

Program Status

Funded projects for FY 2002-03 are being coordinated to implement each component of the WRMP. Total funds to WRMP members through these projects this year total more than $1,000,000 not including in-kind services. Most of the funding is for special studies.



Funding Strategies

There are a variety of possible ways to fund the WRMP. A combination of approaches might be required. A likely strategy would involve contributions of monitoring fees paid by project sponsors in lieu of other monitoring requirements, annual contributions by WRMP member agencies, and competitive grants from agencies and foundations. Large endowments would provide the most secure funding over the long-term. The criteria for choosing a strategy should include safekeeping of the neutrality of the WRMP. The WRMP should have no financial or political interest in the monitoring results.