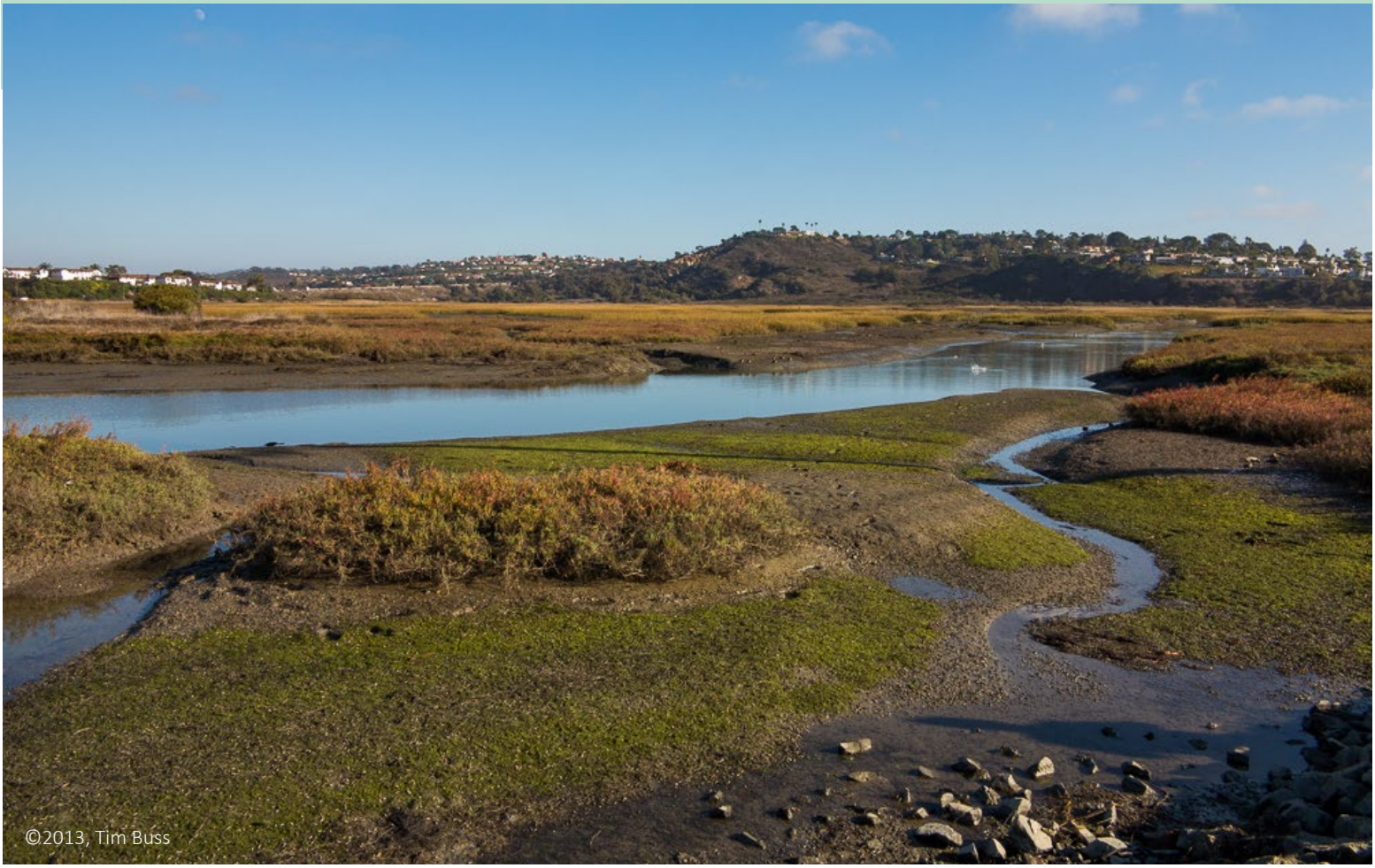
Implementation Strategy for the Wetland Recovery Project Regional Monitoring Program

Provides recommendations for identifying the administrative structure and programmatic needs for long-term implementation of the WRP RMP program



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SOUTHERN CALIFORNIA WETLANDS RECOVERY PROJECT

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Foreword

This document proposes a strategy for how the Wetland Recovery Project Regional Monitoring Program (WRP RMP) can be implemented across coastal tidal wetlands in southern California. We provide recommendations and presume that consistent funding and coordination will be needed to ensure program success. These recommendations do not establish policies or procedures for any agency; rather, they are intended to serve as a roadmap to plan implementation needs and achieve program objectives.

The WRP RMP was developed by the Project Technical Team and a Science Advisory Panel with input from WRP member agencies. This document, which focuses on how to implement the WRP RMP, was written by the Project Technical Team (Table FW- 1) with input from WRP member agencies.

Table FW- 1. The WRP Project Technical Team members

Name	Affiliation	Role
Katie Nichols	State Coastal Conservancy	Project Technical Team
Jan Walker	Southern California Coastal Water Research Project	Project Technical Team
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1. Context

The Southern California Wetland Recovery Project[1] Regional Monitoring Program (WRP RMP) consists of coordinated approaches for coastal wetland monitoring to track progress toward achieving the objectives of Goal 1 of the WRP's Regional Strategy and to assist agencies and implementing organizations in incorporating these approaches into site-specific permit- and funding-required monitoring programs. The WRP RMP provides a mechanism to collect regional scientific information to evaluate project performance, improve regional assessment, enhance data consistency, and provide efficiency (through leveraged efforts) for individual restoration projects.

WRP Regional Monitoring Program goals include:

- Track the collective condition of coastal wetlands in the region and how they are responding to climate change stressors and development.
- Help agencies assess coastal wetland resilience to address climate change effects and develop adaptation strategies.
- Provide landowners/resource managers regulatory and funding agencies with an opportunity to monitor wetlands in a comparable way, improve access to data, and better leverage efforts across programs to improve regional wetland inventories and condition assessments.
- Utilize improved information on wetland condition, resilience, and performance in southern California to help state and federal regulatory programs more effectively manage, preserve, and restore wetlands in southern California.
- Assess progress towards reaching the WRP's Regional Goal 1 for coastal wetland restoration, under the WRP Regional Strategy 2018.

The development and formation of the WRP RMP includes a process for establishing a sentinel site network[2], a monitoring strategy, agency guidance, and an implementation strategy for coastal wetland monitoring in southern California. The monitoring program is described in the following four documents:

1. Development of a Coastal Wetland Sentinel Site Network. Summarizes recommendations for the development and maintenance of a statewide sentinel site network and provides recommendations for southern California sentinel sites[3].
2. Monitoring for Management: A Monitoring Strategy for Southern California Wetlands. Provides an overview of the monitoring strategy, monitoring questions, and priority indicators necessary to develop the WRP Regional Monitoring Program.

[1] The Southern California Wetlands Recovery Project (WRP) is a partnership of 18 State and Federal agencies that was formed in 1997 to serve as a regional voice for the valuable yet diminishing coastal wetlands of southern California and to cooperate on effort to promote their recovery.

[2] Sentinel sites are coastal wetlands that are designated for long-term monitoring to track ecological condition through time, evaluate the effect of regional trends in external conditions/stressors, and track progress towards regional objectives, strategies, or plans.

[3] https://onlinelibrary.wiley.com/doi/pdf/10.1111/rec.70062

3. Applicability of Regional Monitoring for Agencies: Guidelines for Incorporating the WRP Regional Monitoring Program into Agency Programs. Provides agency-specific guidelines for applying the regional monitoring approach to permitted and funded projects.
4. Implementation Strategy for the WRP Regional Monitoring Program. Provides recommendations for identifying the administrative structure and programmatic needs for long-term implementation of the WRP RMP program.

The content of this document provides a strategy for how the WRP RMP can be implemented in southern California (item #4 above).

2. Introduction

While there are over a hundred coastal wetlands of varying sizes in coastal Southern California, there is currently no monitoring program that tracks the collective health and resiliency of wetlands in the region and how they are responding to stressors brought on by climate change and anthropogenic impacts. A major challenge in coordinated wetland restoration is that the responsibility for assessing wetland extent, abundance, and condition and managing data currently resides with multiple agencies. Amongst these agencies, there are a number of wetland monitoring sites, approaches, and protocols, for both voluntary restoration and mitigation projects in the southern California region.

The WRP Regional Monitoring Program aims to develop coordinated approaches for coastal tidal wetland monitoring in Southern California, to track progress toward achieving objectives of the WRP Regional Strategy 2018, and to assist interested agencies and implementing organizations in incorporating these approaches into site-specific permit- and funding-required monitoring programs. Through leveraging systematically collecting and analyzing monitoring data, agency staff and resource managers can make more informed decisions about how to preserve the ecological integrity and functionality of wetlands and estuaries, ensuring that these vital habitats continue to provide essential ecosystem services.

Implementation of the WRP RMP is centered on three primary elements:

1. Core monitoring of sentinel sites at defined intervals;
2. Project monitoring through grant and permit programs; and
3. Special studies.

Specifically, "core monitoring" is focused on monitoring the WRP Sentinel Site Network at regular intervals to track ecological condition of coastal wetlands through time and to evaluate regional trends. The goal of the monitoring program is to address the objectives of Regional Strategy Goal 1 by answering questions around wetland extent, condition, and resilience (Document #2, Monitoring for Management). Grant and permit monitoring leverages and intensifies efforts to support the core monitoring by adding indicators based on project specific goals (e.g., sensitive species surveys), adding sites (i.e., grant or permit sites that are not already sentinel sites), increasing the frequency of monitoring, or increasing spatial intensity within sites. For more details on the monitoring questions, elements, and indicators, see Document #2 - Monitoring for Management. Lastly, special studies (such as those undertaken by researchers at academic institutions like the University of California and California State University Systems) provide deeper understanding through targeted investigations of specific sites or functions. These studies can complement the core monitoring.

The goal of the Implementation Strategy is to identify the administrative structure and programmatic needs to implement the WRP RMP successfully in the long term. Successful implementation requires consideration of the following components:

- Program management: What is the ideal approach for managing implementation of the WRP RMP in the long-term and ensuring data is readily accessible to agency staff and the public, and what roles can participating members play in implementation?

- Facilitating participation: How do we provide sufficient support to implementing partners to promote and incentivize the adoption and continued use of the WRP RMP and to provide a mechanism for collaboratively adapting the program over time based on changing needs?
- Cost and funding strategy: How much will it cost to implement the program and the three monitoring elements (core, grant and permitting, and special study monitoring) and how can these funding needs be met?

For each component, we provide a general discussion and a recommended strategy that the WRP RMP could implement. **We make three overall recommendations:**

1. Program management should be assumed by an existing organization.
2. Ongoing coordination can be conducted by the same entity that serves as the WRP RMP program manager.
3. Diverse sources of funding should be sought for program administration, field coordination, data management, and reporting, and ideally would be long-term and stable.

3. Program Management

Program management and coordination is needed to support the implementation of core monitoring and help facilitate implementation of the WRP RMP through permit and grant funding. Program management consists of the following:

- Administration
- Field coordination
- Data management
- Reporting

Administration

The entity managing this program will need to establish a structure that provides opportunities for all interested parties (e.g., regulators, resource managers, funders, practitioners, community organizations) to participate in some aspect of the monitoring program. We recommend a single entity manage the program and coordinate with participating agencies and project leads. Moreover, a single organization (coordinating with a team or committee as needed) needs to be entrusted and empowered to administer the day-to-day aspects of the program (e.g., administration, field coordination, data management, and reporting).

Implementation of the Program will be supported by the existing WRP working groups – the Director's Group, Wetland Managers Group, Science Advisory Panel, and Wetland Advisory Group. These groups will work in coordination to ensure adequate input in scientific and technical matters and ensure agency policies regarding monitoring requirements inform the Program and decision-making. The long-term sustainability of this Program will also depend on the ability to develop and support structures and processes for ongoing interagency coordination (as described in the Facilitation section below). While the WRP RMP will be supported by the WRP and its working groups, WRP agencies will need to individually determine how and to what extent they adopt and implement aspects of the Program (see Document #3, Applicability of Regional Monitoring for Agencies). By endorsing the program, WRP members have committed to support program implementation through their relevant authorities, promote its use, and provide the necessary coordination for the program to be implemented. In addition, other agencies who are not part of the WRP can also participate in program implementation through use of the program, commitment of resources, coordination, and cooperation. Mechanisms for ongoing collaboration among all partners will be critical for successful long-term implementation and these activities will be coordinated by the designated WRP RMP program administrator.

We envision this program to be iterative, that the program will evolve and grow as it is utilized at sites and we learn lessons about its functionality and use. This evolution can involve adaptively revising and updating the monitoring program itself based on experience with its implementation. It can also include changing (and possibly streamlining) the coordination structure to improve overall program participation.

Field Coordination

A key aspect of the RMP is the continued, routine monitoring via core monitoring. Field coordination will consist of implementing and overseeing the core monitoring effort and ensuring coordination among the other two monitoring elements (grant and permit monitoring and special studies).

Core monitoring is focused on monitoring the WRP Sentinel Site Network at regular intervals to track the ecological condition of coastal wetlands through time and to evaluate regional trends, with the purpose of answering critical monitoring questions on a five-year cycle (see Doc. #2 - Monitoring for Management). Ideally, monitoring should occur on an ongoing, annual basis to best address questions around wetland extent, condition and resilience; however, practical constraints (e.g., funding, resources, staffing) likely preclude this. Therefore, we have structured implementation of the core monitoring of the sentinel site network to be anchored in a five-year cycle. Also, the modular nature of the monitoring program provides flexibility, such that projects can use select core indicators and add supplemental indicators of interest to assess their specific project objectives.

Field efforts will be coordinated with the field work of other state and regional monitoring efforts to not only save time and money, but to ensure comparability of data between programs across the region and state of California. Specifically, the WRP RMP was built on and modelled after the assessment framework, standard monitoring protocols, data structures, and quality control measures of The California Estuarine Marine Protected Area (EMPA) Monitoring Program, which monitors both estuary Marine Protected Areas (MPAs) and non-MPAs in an ongoing effort to assess the quality and condition of estuaries statewide. As of 2025, the WRP RMP sentinel site network includes 37 sites, and a subset (7), of these sites are included in the EMPA program. The WRP RMP will also align the monitoring cycle with the Southern California Bight Regional Monitoring Program. The Bight Program is an ongoing marine monitoring collaboration that examines how human activities have affected the ecological health of more than 1,500 square miles of southern California's coastal waters. Nearly 100 organizations pool their resources and expertise to support the program, which runs in five-year cycles.

Data Management

A key objective of the Program's data management system is to ensure that data are readily discoverable, interpretable, and shareable in a flat file format (i.e. a .csv file) that can be easily downloaded and used to support a variety of analysis needs. The flat file format allows incorporation into a variety of data interpretation and visualization tools (which could be developed by the WRP RMP or other entities).

The use of standard protocols and a unified data management framework facilitate data sharing across projects. For cost efficiency and consistency, the WRP RMP may build upon the Quality Assurance (QA) and data management structure developed for the EMPA program or adapt a compatible system that enables both programs to operate within a shared framework. An integrated data management system is essential for overseeing the full data life cycle, from collection through information dissemination. Embracing open data practices will further support data accessibility, sharing, and interpretation. Data sharing is required by many funders including the State of California and a central goal of the WRP RMP, and we acknowledge that successful program implementation will require a data QA and sharing policy that encourages participation while also providing publicly accessible data free of charge.

Additional considerations for data management include:

- Identifying a data management system that meets the attributes discussed above, along with providing funding for the system
- Continuing maintenance and promotion of the selected data management system to ensure the longevity of the system and continued use
- Encouraging connectivity with other relevant data portals via web services and application program interfaces (APIs) to facilitate data access and sharing
- Managing data in a geospatial format to enhance data visualization and interpretation, facilitate data integration across programs, and view sentinel sites & participating wetland restoration projects via a map
- Providing user-friendly, map-based tools to explore, access, and download data in readily transferable formats (e.g., csv)
- The program should require project partners to submit data to a single portal, with mechanisms to alert agency staff when items have been submitted

Reporting (Including Data Analysis)

An essential component of the WRP RMP is communication about the status and trends within the southern California region to track progress toward achieving the objectives of the Regional Strategy. A designated entity needs to be responsible for (and adequately funded) to conduct the necessary data analysis and provide the following outputs:

1. Status and Trends Report – Every five years following the completion of the core monitoring, a technical report will be produced on both the current round of monitoring and trend data from past monitoring. This report will include initial answers to the seven monitoring questions around wetland extent, condition, and resilience and an evaluation of the objectives of Goal 1 of the WRP Regional Strategy. The report will also include recommendations for subsequent monitoring phases and potential modifications or adaptations of the program. This type of tracking can include projects both on and off the WRP Work Plan. This report will be critical in guiding the next round of core monitoring.
2. Published Dataset – Monitoring data (and associated metadata) collected during the monitoring cycle will be verified and published alongside the Status and Trends Report.
3. Data Interpretation Tools – Data visualizations, indices, and other interpretation tools should be developed over time (based on available funding). These tools facilitate conversion of data into information and make it easier for managers and practitioners to use the monitoring results to inform their decision-making processes.

Reporting will be coordinated and disseminated broadly including to other state and regional estuary monitoring programs (see below section on Coordination).

Recommendation

We recommend that overall program management be assumed by an existing organization whose mission and expertise involve implementing regional or statewide monitoring programs. This entity (or entities) would be responsible for the ongoing coordination of sampling, data management, data analysis, reporting, and facilitating engagement and participation in the program. Implementation of this recommendation would require support for the program as outlined in Document #3: Applicability of Regional Monitoring for Agencies and a sustained funding strategy (see below).

This recommendation was made after considering several options for overall program management (Table 1). Following consideration of the options, we recommend using an existing regional monitoring entity.

Table 1. Options for overall program administration. The recommended option is shaded.

Option	Pros	Cons
1. Existing State Agency/Program	Leverages existing program structure, relationships, and resources.	Staffing and resources for existing programs are already limited, and taking on additional responsibilities may be challenging
2. Existing Regional Monitoring Organization	Takes advantage of relevant expertise and capabilities of an organization focused on monitoring	Would require additional resources to allow the organization to accommodate the new program
3. Merge with an existing program	Could foster additional coordination between programs. Can leverage capabilities of existing collaborations	May dilute the capacity and resources of the original programs. Additional focus might not be prioritized.
4. Form a new entity	New entity would be focused on SoCal Wetland monitoring as its primary goal	Would need a cooperative agreement or MOU, staff, and organizational structure. Would take additional time and resources to develop.

4. Facilitating Participation

Participation

The intended users of the WRP RMP include federal agencies, state agencies, and tribal governments and organizations; as well as environmental nongovernmental organizations (NGOs), resource managers, and restoration practitioners engaged in wetland recovery efforts throughout the WRP's geographic region. These entities will require ongoing technical support for application of the WRP RMP design and protocols, use of the data portal, and monitoring at the sentinel sites. Over time, the program management entity can facilitate partnerships with other efforts in the State to expand capacity for participation by community-based organizations through local monitoring, education, and other forms of engagement.

Facilitating participation among partners will promote buy in, reduce redundancy, improve efficiency, promote knowledge sharing, and build support for long-term implementation. Facilitating participation can also include developing training and support materials, such as:

- Convening regional stakeholder workshops
- Fostering partnerships with NGO's and regional science networks
- Tribal engagement and trainings through placed-based monitoring opportunities
- Training on the use of data templates, field protocols, and the data portal

Trainings can occur via a fee-based model using existing or new training entities (e.g., UC Extension, private training organizations, Water Board training academy).

Coordination

Another element of facilitating participation is to coordinate with other regional and statewide programs (examples include the SF Bay WRMP and others promoted and shared via existing statewide workgroups). The California Estuary Monitoring Workgroup (CEMW) and the California Wetland Monitoring Workgroup (CWMW) are workgroups of the California Water Quality Monitoring Council formed to coordinate estuary and wetland monitoring and assessment tool development among federal, state, and local agencies, tribal governments and organizations, and non-governmental research organizations. The entity responsible for WRP RMP outreach and coordination should help represent the programs on both the CEMW and CWMW. The program should also work toward adoption of the WRP RMP into the California Surface Water Ambient Monitoring Program (SWAMP) and other existing monitoring programs. Through such adoption, expertise and capacity will be developed among partner agencies and their consultants.

Recommendation

Ongoing facilitation, training and coordination can be conducted by the same entity that serves as the WRP RMP program manager. However, a separate entity with appropriate expertise should be responsible for these tasks (in cooperation with the program management entity).

5. Cost and Funding Strategy

Program Costs

To ensure longevity, a diverse funding strategy needs to be established to support program management and coordination, monitoring implementation, reporting, and promoting participation. This includes strategies for shared funding of the program through agency funds, and grantee and permittee support.

There are a variety of costs for the program that need to be considered:

1. General program management - administration, field coordination, data management, reporting
2. Core monitoring of the sentinel sites - direct field studies, including field sampling, lab processing and data management
3. Integration of grant and permit monitoring - directly engaging with regulatory and funding agencies, permittees, and grantees to support implementation of the monitoring program through individual projects (See Document #3 - Applicability of Regional Monitoring for Agencies for additional details)
4. Facilitating participation - coordination, training, fostering partnerships

Approximate implementation costs are shown in Table 2. Costs were estimated and provided as ranges for the anticipated time necessary for each implementation category, based on experience with the time required to administer other regional monitoring programs. Precise budgets would need to be refined once the managing entities are selected for each implementation category.

Table 2. Approximate cost for each implementation category and potential funding sources. The necessary funding interval is shown in the third column.

Implementation Category	Approx. cost	Interval	Agency Allocation	Monitoring Payments	Contracts & Grants	Participant dues	In-kind cost share	Enforcement funds
General program management	$300,000 - $350,000	annual						
Core monitoring of the sentinel sites (37 sites @ $70k per site)	$2.6 - $3.1 million	every 5 yrs						
Integration of grant and permit monitoring	$50,000 - $70,000	annual						
Facilitating participation	$100,000 - $125,000	annual						

**This table does not include habitat mapping. Cost estimates could vary based on in-kind staff support from partner agencies, cost sharing and coordination with other monitoring programs (e.g., EMPA, SONGS, Bight), and the frequency of monitoring.*

General program management includes the four categories (administration, field coordination, data management, and reporting). Cost estimates could vary on the frequency of monitoring, frequency of reporting, and the level of funding and participation in different components by different organizations.

Funding Strategies

The funding sources for the WRP RMP would ideally be long-term stable sources of funding. A variety of funding strategies should be explored and multiple funding strategies may need to be developed to support the program over the long term. Certain funding strategies may be more or less appropriate for different implementation components.

- *Direct allocation of agency funds* via administrative or legislative action (e.g., budget change proposal). This would be the most direct and efficient funding mechanism but would require substantial upfront effort to establish.
- *Optional monitoring payments* associated with projects that require compliance monitoring associated with permits or performance assessments associated with grant-funded restoration projects. This funding source may be somewhat intermittent and may involve additional regulatory requirements.
- *Contracts and grants* that directly support program management, data management, or implementation aspects of the monitoring program. There are a variety of contract and grant options, but many would require a competitive process that includes uncertainty and may only have marginal returns on the time invested pursuing the funds.
- *Participant dues* from organizations that form a monitoring collaborative that supports regional assessments, sentinel site monitoring, or other common monitoring needs. This funding source would require additional program management capacity for collecting and managing dues but may be a sustainable option once a collaborative is established.
- *Cost-sharing and in-kind services* from a range of organizations. This model is used effectively by many regional monitoring programs and involves partner agencies funding specific aspects of the monitoring program through cost-share agreements or in-kind services. This strategy typically has relatively low overhead costs but requires substantial coordination to ensure all priority aspects of the program are funded. Often this strategy is more appropriate for site monitoring, particularly when there are regulatory requirements for long-term monitoring, and less appropriate for program management.
- *Supplemental Environmental Projects (SEPs) and other enforcement funds* SEPs are environmentally beneficial projects undertaken to offset a civil penalty as a result of a violation of the Clean Water Act. SEPs may be a funding source for certain activities that fall within the SEP policy but would need a clear nexus to the violation. These funds also often require prior approval through a water board process. Additional funds such as fines for enforcement actions by other agencies may also be a source of funding.

Recommendation

Funding sources for the WRP RMP would ideally be long-term stable sources of funding. Direct funding should be sought for the program management (including technical support) and facilitation costs. Monitoring payments, grants, cost sharing and enforcement funds are appropriate funding sources for actual monitoring implementation. The overall program administrator would need to oversee and manage these fund sources.

6. Conclusions

This document provides recommendations for a general implementation strategy. Once a management entity is in place, a more detailed work plan and budget may be developed. Both the WRP Regional Monitoring Program and its implementation strategy are intended to be living documents, to be revisited and updated regularly as lessons are learned from site-level implementation and through ongoing coordination among partners and agencies.

The entire monitoring program should be adaptively managed. Feedback on the program from agencies, practitioners, and other implementing partners should be collated and reviewed annually. In addition, monitoring approaches, protocols and indicators should be reviewed after each round of core monitoring (every five years). Input from both core and ongoing monitoring programs should be used to revise and update the program as needed every five years.

By providing standard frameworks, protocols, and recommendations for incorporating the components of the WRP RMP into agency programs, the overall vision is to:

- Leverage existing datasets
- Increase data sharing
- Make regional data available to decision makers and practitioners
- Streamline processes
- Allow for prioritization of funding and effort for wetland restoration in the region