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***Evaluating Wetlands Restoration: A Regional Wetlands Ecosystem Monitoring Program***  
**Inquiry Submittal to Category III by the San Francisco Estuary Institute.**

**A. Applicant:** San Francisco Estuary Institute (SFEI), 1325 S. 46<sup>th</sup> Street, Richmond, CA 94804. Phone: (510) 231-9539. Fax: (510) 231-9414. Contact: Margaret R. Johnston, Executive Director. E-mail: johnston@sfei.org

**B. Project Description and Objectives:** SFEI proposes to develop a Regional Wetlands Ecosystem Monitoring Plan (RWEMP) for the San Francisco Bay and Delta to provide scientific understanding needed to increase and enhance wetlands habitat and function and increase the size of populations of target species and species assemblages dependent upon these habitats. The plan would move wetlands monitoring from the current fragmented, project-specific approach to a long-term standardized regional approach that provides for independent assessment of the performance of individual restoration projects, comparison among projects, trend assessment for attainment of regional goals or targets, and regular reporting on the status of regional wetlands ecosystem condition. The RWEMP would improve the ability of CALFED to practice adaptive management in the restoration of wetlands habitats and their associated species, insuring that lessons learned in restoration efforts are documented and available for future use.

**C. Approach/Tasks/Schedule.** Adoption of the RWEMP will require that the program be of the highest scientific quality and that the program address the management concerns of the various agencies. No one organization possesses all of the expertise needed to develop the program; it must be a collaborative effort among the California Department of Fish and Game, the California Department of Water Resources, the California Coastal Conservancy, Regional Water Quality Control Boards 2 and 5, the U.S. Fish and Wildlife Service, the U.S. EPA, the U.S. Geological Survey and the Army Corps of Engineers. SFEI's role in developing such a program would include: (1) developing a scientific framework, (2) identifying a team of individuals from within academia, government agencies, the private sector and non-governmental organizations that would be instrumental in each task described below, hereafter, this team is referred to as the *Wetlands Monitoring Group or WMG*, (3) organizing meetings and or workshops, and (4) producing analyses and documentation based upon the WMG's direction, and (5) producing the implementation plan. Specific tasks would include:

- 1. Identify conceptual models of wetlands form and function** to be used to indicate the major components of the wetlands to be assessed, suggest the major hydrogeomorphic and ecological types of wetlands to serve as a sampling strata, suggest post-stratification of data along environmental gradients, and suggest how the monitoring of tidal wetlands might be linked to monitoring efforts focusing on neighboring watersheds and open waters of the Estuary.
- 2. Develop Regional Wetlands Atlas in GIS** to illustrate inventories, use as an analytical and visioning tool, and provide information sharing via the world wide web for public information and interagency communication. Existing data and GIS data layers will be used wherever adequate. The GIS is largely complete for the Bay Area; expansion through the Delta is needed.
- 3. Develop a diagnostic approach to wetlands 'health' and restoration project performance**, using *Performance Indicators, Stressor Indicators, Component Measures and Reference Conditions and Reference Sites*. Assessment would be based upon functional *Response Curves* illustrating how indicators trend toward (or away) from reference conditions. The plan will illustrate application of the diagnostic approach to both regional wetlands condition and local project success and will provide the standardization required to assure that the results of local monitoring efforts are comparable.
- 4. Develop data collection protocols** to dictate the specifics of field methodologies for each Component Measure of each Performance or Stressor Indicator. Existing protocols need to be compiled. Examples should be developed of how the data are to be collected and interpreted.
- 5. Develop data management and transfer protocols** to coordinate the storage, retrieval and transfer of monitoring data and results. A data management system will be developed by SFEI, and data stored either on SFEI's or IEP's file server. Data will be publicly available through the world wide web, as appropriate.
- 6. Develop special studies component of regional monitoring** to insure that new wetlands restoration projects and remediation efforts for unsuccessful projects can be designed as opportunities to learn how to improve the science of wetlands restoration.

7. **Develop an implementation plan** that documents steps 1-6 above, with special regard for the funding and staffing needed to implement the program. The plan should recommend long-term funding mechanisms, suggest reporting frequency and methods (including analysis and interpretation of data), identify audiences for the reports, suggest a means of insuring participation of appropriate agencies, stakeholders and the public, and provide for external scientific review.

**D. Justification for Project Funding by CALFED.** This project addresses numerous habitats targeted in the CALFED Ecosystem Restoration Plan, including *Nontidal perennial aquatic habitat, Sloughs, Saline emergent wetland habitat, Fresh emergent wetland habitat, Midchannel islands and shoals habitat, North Delta agricultural wetlands and Perennial grasslands and Seasonal wetland habitat in Suisun Marsh, and the North San Francisco Bay.* The need for a RWEMP, however, transcends CALFED. All agencies and organizations that fund, sponsor, or require the restoration of wetlands would benefit from this program. Nonetheless, the CALFED Ecosystem Restoration Program will likely result in a marked increase in the amount of wetlands restoration activity, and it will be difficult for CALFED to measure its success in this area without a RWEMP. The objective of this inquiry, then, is to determine the willingness of the CALFED agencies to fund a portion of the development and implementation of such a program.

**E. Budget Costs and Third Party Impacts.** SFEI would expect to request funds sufficient to provide about 33% of the principal investigator's salary, 5% of the Executive Director's salary, and about 25% of an assistant environmental scientist's salary and associated overhead costs for a 18 month to two-year period. Some funding for WMG or technical team member expenses might be required. Total SFEI costs would be in the \$150,000 - \$200,000 range. Extensive in-kind participation and matching funds would be sought. No third-party impacts are anticipated.

**F. Applicant Qualifications.** SFEI is a non-profit research organization charged with fostering scientific understanding of the Estuary. It currently provides science support for four major programs: The *San Francisco Estuary Regional Monitoring Program for Trace Substances*, the *Bay Area Wetlands Ecosystem Goals Project*, a *Watersheds Science Program* and a *Biological Invasions Program*. SFEI is ideally situated, and has a track record for, providing science support for multi-agency teams and identifying and collaborating with teams of qualified technical experts comprised of agency, academic, private sector, and non-governmental organization staff. The Principal Investigator for this project will be Dr. Joshua Collins. Ms. Margaret Johnston will take the lead on task 7. Biographical information is attached.

**G. Monitoring and Data Evaluation** comprise the entire project.

**H. Local Support/Coordination with other programs/Compatibility with CALFED objectives.** This proposal is related to several others that may be submitted for Category III funding. The Napa-Sonoma Marsh Complex Monitoring Program will develop a modeling approach and some needed wetlands monitoring protocols, establishing groundwork for a regional program. The Regional Wetlands Ecosystem Goals Project will ensure that a GIS is in place for the Bay Area, and that a large portion of the required background information on wetlands indicators has been compiled for wetlands downstream of the Delta; funding of the completion of that program by Category III would provide much of the remaining groundwork for the RWEMP. The RWEMP would be carried out in collaboration with the Interagency Ecological Program, and could be considered a component of the ecosystem monitoring program that IEP is developing for CALFED.

Using past funding from U.S. EPA, SFEI has developed a *Draft Science Framework for a Bay Area RWEMP*, which serves as the conceptual basis for the approach described above. Expanded to include the Delta, SFEI believes this approach would well serve CALFED's need to assess the effectiveness of wetlands restoration projects within its purview. SFEI has had direct discussions with EPA and Regional Water Quality Control Board 2 concerning the need for a RWEMP. The Bay Area Wetlands Planning Group, which involves all agencies involved in wetlands regulation and management in the Bay Area, has discussed the need for a systematic, long-term approach to monitoring wetlands mitigation projects, and the possibility of establishing a program modeled partly on the Regional Monitoring Program for Trace Substances that is administered by SFEI.

## References:

- Joshua N. Collins, 1995, *Regional Wetlands Monitoring Plan for the San Francisco Bay Area*, San Francisco Estuary Institute, Unpublished review draft submitted to the U.S. Environmental Protection Agency.
- Paul A. Jones, 1997, *A Proposal Regarding Compensatory Mitigation Monitoring under Section 404 of the Clean Water Act*, U.S. EPA Region IX. Unpublished discussion paper.
- SFBRWQCB, 1997. *Draft Report on Wetland Reference Sites in the San Francisco Bay*. San Francisco Bay Regional Water Quality Control Board.

## Biographical Information:

**Joshua N. Collins, Ph.D., Environmental Scientist** Dr. Collins received his Ph.D. in Entomological Sciences at the University of California at Berkeley and has done post-doctoral studies in Geography and Ecology at the University of California at Berkeley and Davis. His research is about the biotic and abiotic controls for the structure of freshwater, palustrine communities and the evolution of tidal wetland ecosystems. Dr. Collins has been a professional ecologist in the Public Utilities Industry and a consulting ecologist in private practice for wetlands restoration design and review. In his current position he is the Director of the Wetlands and Watersheds Program at the San Francisco Estuary Institute and he serves as the Science Coordinator for the Bay Area Wetlands Ecosystem Goals Project.

**Margaret R. Johnston, Executive Director.** Ms. Johnston has served as the Executive Director of the San Francisco Estuary Institute since its creation in 1994, and its predecessor organization, the Aquatic Habitat Institute since early 1988. Her professional career has focused on the application of scientific information to the management of coastal and estuarine resources. She has broad experience in directing programs that build consensus on innovative and far-reaching resource management problems through work with a variety of interest groups, including government agencies at the federal, state, and local level, business and industry, academia, and citizen activists. She is one of the chief architects of the innovative and acclaimed *San Francisco Estuary Regional Monitoring Program for Trace Substances*, a unique program administered by the Institute on behalf of 63 discharge permit holders and the SFB Regional Water Quality Control Board. Prior to her tenure at the Institute, Ms. Johnston served as Executive Director of the tri-state Chesapeake Bay Commission where she was instrumental drafting the Chesapeake Bay Agreements of 1983 and 1987 and in gaining approval of legislative and budgetary actions necessary for their implementation. She received her M.S. in Natural Resources Policy and Administration from the University of Michigan.