



**Philip Williams & Associates, Ltd.**  
Consultants in Hydrology

I1-024

Pier 35, The Embarcadero  
San Francisco, CA 94133  
Phone (415) 981-8363  
Fax (415) 981-5021

July 24, 1997

(PWA Ref. # 97-062)

CALFED Bay-Delta Program Office  
1416 Ninth Street, Suite 1155  
Sacramento, CA 94814

To the CALFED Bay-Delta Program:

Philip Williams & Associates, Ltd. (PWA) is pleased to submit ten copies of our inquiry proposal for the CALFED Ecosystem Restoration Projects and Programs entitled Freshwater Tidal Wetland Restoration on Flooded Delta Islands: Demonstration Project.

Please let us know if you have any questions or if you require any additional information.

Sincerely,

*Joan Florstein Ph.D. for*

Philip Williams, Ph.D., P.E.  
Principal

DWR WAREHOUSE  
97 JUL 28 AM 11:35

/G:\P54\CALFED\97062.tr wp6 1 7/24/97

**Environmental Hydrology Engineering Hydraulics Sediment Hydraulics Water Resources**

Printed on Recycled Paper

I - 0 0 7 5 0 7

I-007507

## I. CALFED INQUIRY SUBMITTAL

### a. Freshwater Tidal Wetland Restoration on Flooded Delta Islands: Demonstration Project

**Applicant:** Philip Williams & Associates, Ltd., Pier 35 The Embarcadero, San Francisco, CA  
94133  
phone 415/981-8363; fax 415/981-5021; e-mail sfo@pwa-ltd.com

### b. Project Description and Primary Biological/Ecological Objectives

This project proposes to evaluate the feasibility of restoring flooded Delta islands to freshwater tidal marsh habitat. Historically, about 320,000 acres of freshwater tidal marshplain existed in the Delta. These wetlands were diked and drained in the late 1800's and early 1900's for agricultural reclamation, and only about 3% of historic wetlands remain today. Many Delta islands subsided as much as 20 feet below sea level and levee failure and flooding are significant problems. Approximately 10 islands are flooded or partially flooded today. As peat soils in the Delta islands continue to subside, levee maintenance and repairs will become more costly and abandoned flooded islands will become more common. Thus, restoration of flooded islands presents a major restoration opportunity, not just for the currently flooded islands, but for islands that flood in the future. Few restoration designs have been implemented on flooded islands in the Delta (Donlon Island, Venice Cut, Prospect Island) and little is known about the overall feasibility of flooded island restoration (raising the ground surface so that wetland vegetation can become established, time-scale for habitat development, cost, regulatory issues). This project will evaluate the feasibility of restoring ecological function to flooded Delta islands and select a demonstration site for restoration project implementation. The primary biological and ecological objectives include:

- Restore freshwater tidal wetland habitat for fish and migratory birds;
- Restore delta smelt habitat in functioning productive tidal slough channels and shoal habitat;
- Reduce the long-term habitat loss on flooded islands and with the Delta ecosystem;
- Reduce levee maintenance requirements (dredging, vegetation removal, armoring);
- Advance development of methods for implementation of a broad restoration program for Delta islands.

### c. Approach/Tasks/Schedule

This project takes a phased approach to determine the feasibility of restoring flooded Delta islands, selecting appropriate islands to test restoration techniques, and implementing a pilot project. In Phase I, we will evaluate the feasibility of restoring one or more flooded Delta islands. In Phase II we will develop a conceptual restoration plan for the selected island. Finally, in Phase III, the plan will be implemented and monitored.

#### Proposed Tasks for Phase I

Task 1. Describe Current State of Knowledge of Freshwater Tidal Marsh Restoration

Task 2. Reconnaissance of Flooded Delta Islands

Task 3. Evaluate Feasibility of Restoring Ecological Function to Flooded Delta Islands:

*No Action; Site Grading of Levee Benches; Limit Wave Action; Repair Levees, Pump, and Restore.*

Task 4. Develop Site Selection Criteria/Identify Island to Restore in Phases II and III

**Phase II:** Acquire Land; Develop a Conceptual Restoration Plan.

**Phase III:** Prepare Final Restoration Design; Implement Restoration Design; Monitor Restored Site



## **Schedule**

Phase I— 8 months; Estimate for Phase II—12 months; Estimate for Phase II—12 months

### **d. Justification for Project and Funding by CALFED**

This proposed feasibility study with demonstration projects on currently flooded islands will enable us to explore the possibility of establishing tidal fresh emergent wetland and shoal habitat in the Western and Central Delta, and may, if successful, provide methods to restore tidal wetland and shoal habitat on currently flooded islands and islands that are flooded in the future. The proposal:

- Addresses problem of flooded islands (islands threatened by flood damage and seismicity);
- Increased flood storage and flood control benefits (no confined channel flow);
- Potential for beneficial re-use of dredged material.

This project seeks to develop methods for re-establishment of large areas of productive tidal wetland and shoal habitat in the Central and Western Delta, where building up subsided areas in a reasonable amount of time is important for both ecosystem restoration and long-term reliability. To accomplish restoration of flooded islands it is necessary to encourage natural sediment deposition and establishment and persistence of emergent vegetation.

### **e. Budget Costs and Third Party Impacts**

Phase I cost estimate \$50,000; no significant third party impacts are anticipated.

### **f. Applicant Qualifications:**

Philip Williams & Associates, Ltd. (PWA), Philip B. Williams, Ph.D., P.E., President. PWA has completed over 400 wetland restoration plans and analysis of tidal, seasonal, and riparian wetlands and has conducted long-term monitoring of several tidal wetland restoration sites in the San Francisco Bay Estuary in the past 10 years.

### **g. Monitoring and Data Evaluation**

PWA will monitor pre- and post-project physical and biological conditions especially in relation to the ecosystem goals set forth in the Ecosystem Restoration Program Plan (ERPP).

### **h. Local Support/Coordination with Programs/Compatibility with CALFED Objectives**

The Department of Fish and Game (DFG) has expressed initial interest in this concept. PWA would work with interested stakeholders and agencies and work to find matching funds in Phase II and III. This proposal is consistent with major ecosystem goals of CALFED including increased tidal fresh emergent wetland and shoal habitats in the Delta; lessening the risk that Delta island flooding poses to water supply system reliability; and beneficial use of dredge material. The proposal is consistent with ERPP actions that include restoring wetlands in the North and East Delta Ecological Units, along setback levees, and on restored channel island habitat. In the Central and West Delta Ecological units CALFED plans for tidal marsh restoration are limited to increased seasonal (non-tidal) marsh habitat on leveed islands (for subsidence control and island accretion as well as habitat). While non-tidal marsh creation may be a good method for subsidence control and accretion, other methods which could lead to faster accretion must be explored. This project would provide insight in understanding the feasibility of other methods.

