

Suisun Marsh Land Acquisition and Tidal Marsh Restoration

Project Information

1. Proposal Title:

Suisun Marsh Land Acquisition and Tidal Marsh Restoration

2. Proposal applicants:

Carl Wilcox, California Department of Fish and Game
Terri Gaines, Department of Water Resources
Lee Laurence, U.S. Bureau of Reclamation
Carmen Thomas, U.S. Fish and Wildlife Service
Steve Chappell, Suisun Resource Conservation District

3. Corresponding Contact Person:

Dan Buford
U.S. Fish and Wildlife Service
2800 Cottage Way, Rm. W-2605 Sacramento, CA 95826
916 414-6625
Daniel_Buford@fws.gov

4. Project Keywords:

Endangered Species
Habitat Restoration, Estuarine shallow water
Wetlands, Tidal

5. Type of project:

Implementation_Full

6. Does the project involve land acquisition, either in fee or through a conservation easement?

Yes

If yes, is there an existing specific restoration plan for this site?

No

7. Topic Area:

Shallow Water, Tidal and Marsh Habitat

8. Type of applicant:

Joint Venture

9. Location - GIS coordinates:

Latitude: 38.1889954

Longitude: -121.9172287

Datum:

Describe project location using information such as water bodies, river miles, road intersections, landmarks, and size in acres.

Western and northern Suisun Marsh, east of Highway 680 and west of Shiloh Road, in Solano County. Approximate acreage is 800.

10. Location - Ecozone:

2.1 Suisun Bay & Marsh

11. Location - County:

Solano

12. Location - City:

Does your project fall within a city jurisdiction?

No

13. Location - Tribal Lands:

Does your project fall on or adjacent to tribal lands?

No

14. Location - Congressional District:

7th, George Miller

15. Location:

California State Senate District Number: 4

California Assembly District Number: 8

16. How many years of funding are you requesting?

3

17. Requested Funds:

a) Are your overhead rates different depending on whether funds are state or federal?

No

If no, list single overhead rate and total requested funds:

Single Overhead Rate: 4.5 for pass-through funds, 20 for all other

Total Requested Funds: 1,707,051

b) Do you have cost share partners already identified?

No

c) Do you have potential cost share partners?

Yes

If yes, list partners and amount contributed by each:

California Department of Fish and Game - SMPA funds to be determined

d) Are you specifically seeking non-federal cost share funds through this solicitation?

No

If the total non-federal cost share funds requested above does not match the total state funds requested in 17a, please explain the difference:

18. Is this proposal for next-phase funding of an ongoing project funded by CALFED?

No

Have you previously received funding from CALFED for other projects not listed above?

Yes

If yes, identify project number(s), title(s) and CALFED program.

01-E205	Suisun Marsh Property Acquisition and Habitat Restoration	CALFED ERP
01-E201	Hill Slough West Habitat Restoration Restoration Demonstration Project, Phase I	CALFED ERP
1998-F07	Hill Slough West Habitat Restoration Restoration Demonstration Project, Phase II	CALFED ERP

As implementing agencies for CALFED and CVPIA, applicant agencies have previously received funding for many studies. Those most similar and in the same area as this proposal are listed above.

19. Is this proposal for next-phase funding of an ongoing project funded by CVPIA?

No

Have you previously received funding from CVPIA for other projects not listed above?

Yes

If yes, identify project number(s), title(s) and CVPIA program.

As implementing agencies for CALFED and CVPIA, applicant agencies have previously received funding for many studies. Those most similar and in the same area as this proposal are listed above.

20. Is this proposal for next-phase funding of an ongoing project funded by an entity other than CALFED or CVPIA?

No

Please list suggested reviewers for your proposal. (optional)

21. Comments:

Some of the applicants are implementing agencies and have received CalFed and CVPIA direct and indirect funds. Those projects with which the applicants have been directly involved and are most similar to this proposal have been included in the above list.

Environmental Compliance Checklist

Suisun Marsh Land Acquisition and Tidal Marsh Restoration

1. CEQA or NEPA Compliance

a) Will this project require compliance with CEQA?

Yes

b) Will this project require compliance with NEPA?

Yes

c) If neither CEQA or NEPA compliance is required, please explain why compliance is not required for the actions in this proposal.

2. If the project will require CEQA and/or NEPA compliance, identify the lead agency(ies). If not applicable, put "None".

CEQA Lead Agency: Department of Water Resources

NEPA Lead Agency (or co-lead:) U.S. Fish and Wildlife Service

NEPA Co-Lead Agency (if applicable):

3. Please check which type of CEQA/NEPA documentation is anticipated.

CEQA

-Categorical Exemption

-Negative Declaration or Mitigated Negative Declaration

XEIR

-none

NEPA

-Categorical Exclusion

-Environmental Assessment/FONSI

XEIS

-none

If you anticipate relying on either the Categorical Exemption or Categorical Exclusion for this project, please specifically identify the exemption and/or exclusion that you believe covers this project.

4. CEQA/NEPA Process

a) Is the CEQA/NEPA process complete?

No

If the CEQA/NEPA process is not complete, please describe the dates for completing draft and/or final CEQA/NEPA documents.

We anticipate completing the CEQA/NEPA process within 18 months of receiving funding.

b) If the CEQA/NEPA document has been completed, please list document name(s):

5. **Environmental Permitting and Approvals** (*If a permit is not required, leave both Required? and Obtained? check boxes blank.*)

LOCAL PERMITS AND APPROVALS

Conditional use permit	Required
Variance	
Subdivision Map Act	
Grading Permit	Required
General Plan Amendment	
Specific Plan Approval	
Rezone	
Williamson Act Contract Cancellation	
Other	

STATE PERMITS AND APPROVALS

Scientific Collecting Permit	Required, Obtained
CESA Compliance: 2081	Required
CESA Compliance: NCCP	
1601/03	
CWA 401 certification	Required
Coastal Development Permit	Required
Reclamation Board Approval	Required
Notification of DPC or BCDC	Required, Obtained
Other	

FEDERAL PERMITS AND APPROVALS

ESA Compliance Section 7 Consultation	Required
ESA Compliance Section 10 Permit	
Rivers and Harbors Act	Required
CWA 404	Required
Other	

PERMISSION TO ACCESS PROPERTY

Permission to access city, county or other local agency land.

Agency Name:

Permission to access state land.

Agency Name: to be determined, possibly DWR

Required

Permission to access federal land.

Agency Name:

Permission to access private land.

Landowner Name: to be determined, willing seller only

Required

6. Comments.

We will obtain permission to access any properties that meet selection criteria prior to conducting any activities on-site. Only willing sellers will be approached to obtain permission for access.

Land Use Checklist

Suisun Marsh Land Acquisition and Tidal Marsh Restoration

1. Does the project involve land acquisition, either in fee or through a conservation easement?

Yes

If you answered yes to #1, please answer the following questions:

a) How many acres will be acquired?

Fee: up to 500

Easement: up to 500

Total: 500

b) Will existing water rights be acquired?

Yes

c) Are any changes to water rights or delivery of water proposed?

No

2. Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?

No

3. Do the actions in the proposal involve physical changes in the land use?

Yes

If you answered yes to #3, please answer the following questions:

a) How many acres of land will be subject to a land use change under the proposal?

up to 500

b) Describe what changes will occur on the land involved in the proposal.

In phase 4, after planning is completed, bayward levees will be breached or graded down to restore the full tidal prism onto the site. Landward levees will be reinforced where necessary to reduce erosion and prevent flooding of neighboring parcels.

c) List current and proposed land use, zoning and general plan designations of the area subject to a land use change under the proposal.

Category	Current	Proposed (if no change, specify "none")
Land Use	marshland	none
Zoning	marsh preservation	none
General Plan Designation	marsh	none

d) Is the land currently under a Williamson Act contract?

Yes

e) Is the land mapped as Prime Farmland, Farmland of Statewide Importance, Unique Farmland or Farmland of Local Importance under the California Department of Conservation's Farmland Mapping and Monitoring Program?

No

f) Describe what entity or organization will manage the property and provide operations and maintenance services.

DWR, DFG, or SRCD will manage the property and provide operations and maintenance services. The choice of which agency is the land manager will depend on the location of the parcel and its proximity to existing agency land holdings. All three agencies currently own or manage land in Suisun and are capable of providing necessary O&M.

4. Comments.

Conflict of Interest Checklist

Suisun Marsh Land Acquisition and Tidal Marsh Restoration

Please list below the full names and organizations of all individuals in the following categories:

- **Applicants listed in the proposal who wrote the proposal, will be performing the tasks listed in the proposal or who will benefit financially if the proposal is funded.**
- **Subcontractors listed in the proposal who will perform some tasks listed in the proposal and will benefit financially if the proposal is funded.**
- **Individuals not listed in the proposal who helped with proposal development, for example by reviewing drafts, or by providing critical suggestions or ideas contained within the proposal.**

The information provided on this form will be used to select appropriate and unbiased reviewers for your proposal.

Applicant(s):

**Carl Wilcox, California Department of Fish and Game
Terri Gaines, Department of Water Resources
Lee Laurence, U.S. Bureau of Reclamation
Carmen Thomas, U.S. Fish and Wildlife Service
Steve Chappell, Suisun Resource Conservation District**

Subcontractor(s):

Are specific subcontractors identified in this proposal? No

Helped with proposal development:

Are there persons who helped with proposal development?

Yes

If yes, please list the name(s) and organization(s):

Cecilia Brown USFWS

Dennis Becker CDFG

Debra O’Leary ACOE

Laurie Briden CDFG

Frank Wernette CDFG

Comments:

The above individuals, in addition to those named as applicants, provided input via review and comments on the proposal.

Budget Summary

Suisun Marsh Land Acquisition and Tidal Marsh Restoration

Please provide a detailed budget for each year of requested funds, indicating on the form whether the indirect costs are based on the Federal overhead rate, State overhead rate, or are independent of fund source.

Independent of Fund Source

Year 1												
Task No.	Task Description	Direct Labor Hours	Salary (per year)	Benefits (per year)	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
1	Public Involvement	300	23700							23700.0	4740	28440.00
2a	Appraisal	320	25280							25280.0	5056	30336.00
2b	Title Search, Escrow, Deed recording	115	9085							9085.0	1817	10902.00
2c	Property survey						20000			20000.0	900	20900.00
2d	Relocation						50000			50000.0	2250	52250.00
2e	Contaminant survey	60	4275		200					4475.0	895	5370.00
3	Document review and negotiation	350	24938							24938.0	4988	29926.00
4a	Acquisition								750000	750000.0		750000.00
4b	Stewardship upon ownership/nonnative control	100	7125				10000			17125.0	1875	19000.00
5	Owner due dilligence	50	3950							3950.0	790	4740.00
6	Project Management	400	28500							28500.0	5700	34200.00
		1695	126853.00	0.00	200.00	0.00	80000.00	0.00	750000.00	957053.00	29011.00	986064.00

Year 2												
Task No.	Task Description	Direct Labor Hours	Salary (per year)	Benefits (per year)	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
6	Develop pre-project monitoring plan	320	25280				25000			50280.0	10056	60336.00
7	Implement pre-project monitoring plan	5120	404480							404480.0	80896	485376.00
8a	Develop conceptual restoration plan	600					50000			50000.0	2250	52250.00
8b	Hydrologic study	320					45000			45000.0	2025	47025.00
8c	Topographic study	160					20000			20000.0	900	20900.00
9	Project management	400	28500							28500.0	5700	34200.00
10	Begin environmental compliance	250					20000			20000.0	900	20900.00
		7170	458260.00	0.00	0.00	0.00	160000.00	0.00	0.00	618260.00	102727.00	720987.00

Year 3												
Task No.	Task Description	Direct Labor Hours	Salary (<i>per year</i>)	Benefits (<i>per year</i>)	Travel	Supplies & Expendables	Services or Consultants	Equipment	Other Direct Costs	Total Direct Costs	Indirect Costs	Total Cost
		0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Grand Total=1707051.00

Comments.

Please note that 'year 1' = phase 1, and 'year 2' = phase 2 of the project. We expect that phases 1 and 2 of the project will take 3 years to complete.

Budget Justification

Suisun Marsh Land Acquisition and Tidal Marsh Restoration

Direct Labor Hours. Provide estimated hours proposed for each individual.

Please see Attachment 3, detailed budget. The following are the estimated hours needed to complete all tasks for which we are requesting funding that are entered under the labor hour column and are NOT entered under the services/consultant column. Task 1 - public involvement - 300 hours, conducted by SRCD, DWR, or DFG. Task 2a - appraisal - 320 hours, conducted by SRCD, DWR, DFG or FWS. Task 2b - title search, escrow, deed recording - 115 hours, conducted by SRCD, DWR, or FWS. Task 2e - contaminant survey - 60 hours, conducted by FWS. Task 3 - document review and negotiation - 350 hours, this includes all discussions/negotiations with willing sellers, and preparation or review of all documentation related to acquiring fee title or conservation interest in land. Conducted by SRCD, DWR, or FWS. Task 4b - stewardship/nonnative control - 100 hours. The stewardship portion will consist of immediate actions necessary upon taking ownership or conservation interest in a parcel and may include actions such as fencing and signing. This will be conducted by the agency which assumes ownership of the parcel, either SRCD, DWR, or DFG. Task 5 - owner due diligence - 50 hours. This includes any other activities required by the agency that takes ownership of the parcel including checking for liens against the property prior to acquiring fee title or conservation interest. Task 6 - project management - 400 hours. Led by FWS with participation by all applicant agencies. This includes cost validation, progress report preparation and submission to Calfed, responding to specific questions about the project, etc. Task 7 - develop pre-project monitoring plan - 320 hours. The salaried portion of this entry will be conducted by all applicant agencies and will consist of providing review and comment on the plan drafted and completed by a consultant. Task 7 - implement pre-project monitoring plan - 5120 hours. Includes all aspects of pre-project monitoring plan such as physical, chemical, and biological components. This will primarily be conducted by personnel from DWR and DFG. Hours are estimated as follows: 4 months of work at 8 hour days = 640 hours. A crew of 4 people for 4 months = 2,560 hours. Two years of monitoring by 4 people for 4 months/year = 5,120 hours. Task 9 - project management - 400 hours. Led by FWS with participation by all applicant agencies. This includes cost validation, progress report preparation and submission to Calfed, responding to specific questions about the project, etc.

Salary. Provide estimated rate of compensation proposed for each individual.

Please see Attachment 3, detailed budget. Salaries were estimated using the state's (DWR) daily estimate of \$79.00 or the federal (FWS) daily estimate of \$71.25. Both estimates include salary and benefits. The \$79 figure was used for tasks which are likely to be conducted by personnel from multiple agencies. The \$71.25 figure was used when tasks were most likely to be conducted by FWS personnel.

Benefits. Provide the overall benefit rate applicable to each category of employee proposed in the project.

Benefits are included in all salaries, and are generally included in bids submitted by contractors.

Travel. Provide purpose and estimate costs for all non-local travel.

We estimate that the contaminants surveys will require DWR or FWS personnel to travel to the parcel(s) up to 5 times. No overnight stays will be needed, so the approximate per diem cost we are estimating is \$40/trip.

Supplies & Expendables. Indicate separately the amounts proposed for office, laboratory, computing, and field supplies.

Supplies and expendables are included in all the salaries and will be included in bids submitted by contractors.

Services or Consultants. Identify the specific tasks for which these services would be used. Estimate amount of time required and the hourly or daily rate.

Please see Attachment 3, detailed budget. Because all consultant services would be put out to bid, exact hourly rates are unavailable at this time. Phase I: We would most likely use consultants to complete the property survey (Task 2c) and nonnative control (Task 4b). Exact costs for these 2 items will depend upon parcel size, access, and status of nonnative species. These two tasks will be put out to bid, and the price will be determined by the lowest bidder. We have budgeted what we anticipate to be a reasonable cost for these 2 tasks. Phase II: The pre-project monitoring plan (Task 6), the conceptual restoration plan (Task 8a), the hydrologic study (Task 8b), and the topographic study (Task 8c) would be primarily developed by consultants, with input from all applicant agencies. These 4 tasks will be put out to bid, and specific costs will be determined at that time. We have budgeted what we anticipate is a reasonable cost, based on expenses incurred by other previous projects, into our proposal.

Equipment. Identify non-expendable personal property having a useful life of more than one (1) year and an acquisition cost of more than \$5,000 per unit. If fabrication of equipment is proposed, list parts and materials required for each, and show costs separately from the other items.

Equipment costs will be included in bids submitted by contractors. No equipment purchasing is anticipated by the applicant agencies. Any equipment maintenance is included in the salary estimates.

Project Management. Describe the specific costs associated with insuring accomplishment of a specific project, such as inspection of work in progress, validation of costs, report preparation, giving presentations, response to project specific questions and necessary costs directly associated with specific project oversight.

We have estimated 400 hours for project management during phases I and II of this project. Project management will be led by FWS with participation and input from all applicant agencies. Specific tasks under project management include cost validation, contract negotiation and development, interim progress report preparation and submission to Calfed, and inspections of various aspects of the project such as studies and monitoring efforts. We anticipate that the amount of time spent on various project management tasks will vary from phase to phase. Our estimates of time for phases I and II are cost validation (50 hours), contract negotiation and development (220 hours), interim progress report preparation and submission to Calfed (80 hours), and inspections of various aspects of the project such as studies and monitoring efforts (50 hours).

Other Direct Costs. Provide any other direct costs not already covered.

Relocation of landowners does not easily fall under any category (put under Services in budget spreadsheet). Relocation can involve moving costs, covering rent for up to 1 year, as well as various incidentals. Because we have not identified specific parcels at this point, we do not know if relocation will be necessary. We are including the cost of one relocation. If relocation is not necessary, we will use the funds toward additional land acquisition.

Indirect Costs. Explain what is encompassed in the overhead rate (indirect costs). Overhead should include costs associated with general office requirements such as rent, phones, furniture, general office staff, etc., generally distributed by a predetermined percentage (or surcharge) of specific costs.

Overhead rates vary among the applicant agencies. Contractors will include overhead in their bid prices. Federal overhead is approximately 20% for funding received and processed through the offices, and 4.5% for "pass through" funds that are simply transferred to another party for their use. State overhead varies from 17 to 54% depending upon the purpose and use of the funding. Due to the complexities of various overhead charges from the applicant agencies (federal, state, and local agencies) and contractors, we would ask grant managers (NFWF) for multiple contracts. To account for the different funding structures of the agencies involved, we have used a combination of state and federal hourly rates. We have used the federal overhead rates because the point of contact for this proposal is in a federal agency (FWS) and it is likely that if received, most operational funds will be routed through FWS.

Executive Summary

Suisun Marsh Land Acquisition and Tidal Marsh Restoration

We propose to acquire ~500 acres of land meeting selection criteria and conduct pre-project surveys and restoration in western/northern Suisun Marsh, Solano County. This is part of a larger long-term marsh restoration/management project under the Suisun Charter Implementation Plan (SCIP), currently in initial stages of development by the applicant agencies. Funds would be used to further its goals. We will implement tidal wetland restoration element of SCIP along with seasonal wetland management activities authorized under a Regional General Permit and partially funded through Suisun Marsh Preservation Agreement. DFG/DWR will acquire parcel(s); DFG/SRCD/DWR will hold fee title(s)/conservation easement(s), depending upon location(s)/proximity to existing landholdings. Subsequent phases include environmental compliance, restoration implementation, and scientific studies. This project would partially fulfill CALFEDs goal for Suisun: restoring 5,000-7,000 acres of tidal marsh within seven years. This is a pilot study for research/restoration of tidal marsh to implement SCIP. Our objectives: restore and preserve ecological processes, increase area and contiguity of tidal wetlands in Suisun, and assist recovery of at-risk species. Our approach: acquire (fee title/conservation easement) former baylands in northern/western Suisun from willing sellers. We will select lands based on established ECAT selection criteria, in accordance with SCIP. We will restore tidal influence and re-create natural/historic elevations/topography, soil conditions, and plant communities throughout the entire elevational range to restore tidal marsh. Our hypothesis: Tidal ecosystem restoration (sloughs, low, middle and high marsh/transitional zones) will benefit at-risk species. Numerous studies would be conducted on uncertainties: channel dynamics, sediment chemistry/biotic community alterations, water quality, and emergent wetlands formation/colonization. Expected outcome: Restoration of fully-functional tidal marsh will increase abundance/distribution of at-risk and tidal marsh obligate species and improve water quality. This project is consistent with CALFEDs ERP/Science Program and CVPIA. It will partially accomplish five of the six ERP Strategic Goals.

Proposal

California Department of Fish and Game

Suisun Marsh Land Acquisition and Tidal Marsh Restoration

Carl Wilcox, California Department of Fish and Game

Terri Gaines, Department of Water Resources

Lee Laurence, U.S. Bureau of Reclamation

Carmen Thomas, U.S. Fish and Wildlife Service

Steve Chappell, Suisun Resource Conservation District

A. Project Description

1. Problem to be Addressed

Historically, Suisun Marsh and Bay (Suisun) included more than 68,000 acres of tidal wetlands. Over 90% of these wetlands were diked and drained for conversion to agricultural uses, beginning in the mid-1800's. A series of dry years resulted in increased salinity in Suisun, which limited production/success of the farms. Many farms failed, and most were replaced by waterfowl hunting clubs. Water quality degraded further when the Central Valley Project came on line in the 1940s, and then again when the State Water Project and CVP began Delta diversions to San Luis Reservoir in the 1970s. Today, most of the levees originally constructed for agricultural reclamation form part of the infrastructure for managing water levels in seasonal nontidal (managed) wetlands (Goals Project 1999). Many diked wetlands in Suisun Bay have progressively subsided and suffered from lack of adequate drainage. This, coupled with increased water salinity, has contributed to increased soil salinity which impacts wetland habitat quality and increases maintenance costs.

Currently, Suisun Marsh is the Estuary's largest contiguous protected area. However, after more than 100 years of land reclamation, few areas remain with natural flows and elevations. Many linear miles of tertiary channels have been lost, which are important spawning and rearing areas for native fish and are used for feeding and resting by some waterbirds. Of the natural channels that remain, most have degraded natural habitat values from loss of the tidal prism, dredging, levee confinement, isolation from the marsh plain, high water flow, and poor water quality. Tidal marshes, which were once the most common habitat type in the Bay/Delta system, are now restricted to remnant, disjunct patches. Most of the remaining brackish marshes in Suisun lack certain attributes of fully-functioning saline and brackish emergent wetlands.

Numerous documents and many agencies have recommended tidal restoration in Suisun. The Suisun Marsh Protection Plan (1977) recommends wetland restoration for agricultural lands within the management zones of Suisun: "Where feasible, historic marshes should be returned to wetlands status, either as tidal or managed wetlands. If, in the future, some of the managed wetlands are no longer needed for waterfowl hunting, they should be restored as tidal marshes." The Ecosystem Restoration Program Plan (ERPP) of CALFED identifies more specific recovery measures, to restore tidal action to 5,000 to 7,000 acres in the Suisun Bay within seven years of its initiation (ERPP 1999). The Baylands Ecosystem Habitat Goals recommends restoration of tidal marsh in the Suisun subregion, with a specific recommendation of more than doubling the area of tidal marsh to between 30,000 and 35,000 acres (Goals Project 1999). The Suisun subregion includes the Suisun Marsh and the Contra Costa shoreline which extends from west of the Carquinez Strait to east of Pittsburg and includes Browns and Sherman Island.

In 1987, the Suisun Marsh Preservation Agreement (SMPA) was executed by the California Department of Water Resources, California Department of Fish and Game, Suisun Resource Conservation District, and U.S. Bureau of Reclamation. The objective of this agreement is to assure that a dependable water supply is maintained to mitigate adverse effects on Suisun Marsh of the SWP (State Water Project) and the CVP (Central Valley Project) and a portion of the adverse effects of other upstream diversions. In 1995, the SMPA agencies began negotiations that culminated in 1998 of a proposed Amendment Three to the SMPA, to implement certain

actions in lieu of large facilities originally anticipated in the SMPA. Subsequently, the SMPA agencies together with U.S. Fish and Wildlife Service developed the Suisun Marsh Charter, which has the goal of developing a regional plan for Suisun, balancing implementation of the CALFED program with the SMPA and other management and restoration programs in a manner responsive to the concerns of stakeholders and based upon voluntary participation by private landowners. SCIP implementation will help achieve CALFED's objectives to protect water quality and water supply, improve levee stability, and protect and restore the ecosystem. The SCIP will integrate tidal wetland restoration goals and seasonal wetland management activities. Funding, permitting, and implementing a cost-share program, portable pumps, a Water Manager Program, and other activities will help ensure long-term operation of the waterfowl hunting clubs and management of their seasonal wetlands. To help achieve these goals, the applicants intend that this project (tidal marsh restoration) would move forward, through the acquisition of property under this grant, with the implementation of seasonal wetland management activities authorized under a Regional General Permit and funded in part through the SMPA. This would ensure that SCIP implementation moves forward in an equitable manner that benefits all parties.

a. *Goals and Objectives.* The overall goal of this project is to increase the area of self-sustaining, fully functioning tidal marsh in Suisun. The specific objectives of this project are to (1) acquire parcel(s) in northern or western Suisun that are contiguous with or in close proximity to existing tidal wetlands, (2) restore these parcel(s) to a self-sustaining tidal marsh that includes the full elevational range from slough channel to low marsh, middle marsh, high marsh, transitional zones, and upland areas, and (3) assist in the recovery of at-risk species. We propose a multi-phase project, in which up to 500 acres of managed wetlands are restored to tidal marsh. This project is a pilot project to implement expected recommendations of the SCIP. Implementation of this project will partially fulfill the ERP's and the Goals Project's vision and restoration targets for Suisun Marsh, as well as one of CALFED's stated objectives for Suisun.

This proposal is for the initial phases of a multi-phase project and includes (1) acquisition of parcel(s) from willing sellers that meet the selection criteria, (2) restoration planning and environmental compliance, and (3) pre-restoration monitoring of physical, chemical, and biological factors on acquired areas, and (4) monitoring during all stages.

b. *Hypotheses.* Our primary hypothesis is that restoration of tidal marsh, with the full elevation range and tidal prism, will benefit the recovery of at-risk species and alleviate many environmental stressors. To test this hypothesis, we will conduct studies related to all six of the ERP Strategic Goals:

(1) At-risk Species - Diked baylands in Suisun Marsh that are restored to full tidal circulation provide high quality habitat and therefore aid in their recovery. These species include Sacramento splittail (*Pogonichthys macrolepidotus*), salt marsh harvest mouse (*Reithrodontomys raviventris*), California clapper rail (*Rallus longirostris obsoletus*), and Suisun thistle (*Cirsium hydrophilum* var. *hydrophilum*) (see Attachment 1 for full list).

(2) Ecosystem Processes/Biotic Communities - Breaching dikes to restore tidal circulation will promote the formation and maintenance of (a) natural slough/channel morphology, (b) shallow water habitat, and (c) slough-tidal marsh connectivity. Restoring the natural hydrology (frequency, depth, magnitude, and duration of inundation, *etc.*) to a tidal marsh will facilitate the development and establishment of self-sustaining tidal marsh communities and favor native species over nonnative species.

(3) Harvestable Species - Waterfowl densities in restored tidal marshes and seasonal managed wetlands in Suisun may not be significantly different, *i.e.* habitat quality for waterfowl is similar in tidal marshes and seasonal managed marshes.

(4) Habitats - Restoration of contiguous tracts of land will promote the recovery and re-establishment of native species, including at-risk species. Mobile at-risk species will recolonize restored areas once suitable habitat is present.

(5) Nonnative Species - Tidal marsh restoration (slough channel to marsh plain to transitional zone to upland) will result in an increase in abundance and distribution of native species, and a decrease in abundance and distribution of nonnative species.

(6) Sediment/Water Quality - Tidal marsh restoration in Suisun, at the scale proposed, is not expected to affect salinity in the region of the breach or adjacent parcels. Sedimentation rates in Suisun are expected to be lower than those in San Pablo Bay.

In the course of testing and refining the above hypotheses and employing adaptive management, additional hypotheses may be formulated and tested.

c. *Supporting Studies.* A number of tidal marsh restoration efforts in various stages around San Francisco Bay support this proposal. Carl's Marsh and Toy Marsh, on the Petaluma River in San Pablo Bay, have evolved the most rapidly. The dikes surrounding Carl's Marsh were breached in 1994, and natural sedimentation was allowed to occur. In the seven years that have passed, mudflats have developed and cordgrass (*Spartina foliosa*) is beginning to colonize. This progression has also been seen at the Bahia housing development, also on the Petaluma River. No active management has occurred at this site, and the development originally had a lagoon on-site for residents' watercraft. Dredging of the lagoon has not occurred since 1989, and since that time, mudflats have developed, cordgrass has colonized, and California clapper rails have also colonized. As of spring 2001, clapper rails were suspected to be breeding in the newly formed marsh.

The importance of using appropriately sized breaches to speed restoration efforts may be seen at Sonoma Baylands, which was breached in 1995. Rapid sedimentation was anticipated at the site due to its proximity to the Petaluma River, a known sediment source. Sedimentation has not occurred at the expected rate however, thought to be due to the undersized breach and limited tidal exchange at the site.

Within Suisun, the Hill Slough restoration led by DFG, and the ECAT restoration proposals will provide local examples and data on sedimentation rates, breach sizing, and other topics to guide this effort. DFG has developed a vegetation survey protocol specifically tailored for use in Suisun (Keeler-Wolfe 1999). Our vegetation surveys will use this protocol. In addition, the CALFED Levee Investigation Team investigated the effect of breach size on salinity regimes within Suisun, and determined that breached dikes within Suisun result localized changes (increases and decreases) in salinity. We will coordinate with DFG and DWR studies/restoration efforts currently underway, and monitoring plans previously developed for Suisun to share data, coordinate, and add to the regional knowledge base and address CALFED uncertainties.

2. Justification

_____a. *Conceptual Model.* The following conceptual model is for the entire project, which consists of five phases: (1) property acquisition, (2) development of a restoration plan and studies, (3) environmental compliance and study refinement and implementation, (4) implementation of the restoration plan and adaptive management, and (5) monitoring of restoration efforts/results, adaptive management, and data presentation.

To achieve recovery of fully-functioning tidal wetlands, large blocks of contiguous habitat must be restored. By reintroducing the full tidal prism to diked former baylands and re-creating the natural elevation range of a tidal marsh ecosystem, fully-functional, self-sustaining marsh habitats will form, and at-risk species populations will re-establish or increase on the tract(s) and in the area. A fully-functioning tidal marsh ecosystem includes the full elevational range from tidal sloughs, low, middle, and high marsh/transition zones, and upland areas (Goals Project 2000). Native plant species will colonize along the elevation gradients and within the appropriate microclimate. Tidal elevation and salinity strongly influence the distribution of tidal marsh plants (Goals Project 2000). For example, native cordgrass (*Spartina foliosa*) typically colonizes areas between mean low water and mean high water, whereas pickleweed (*Salicornia virginica*) typically colonizes at or above mean high water. As native vegetation habitats develop, native fish and wildlife species (including at-risk species) will inhabit these areas, resulting in an increase in their distribution and abundance.

Restoration of the full tidal prism and natural elevational range within large tract(s) of land within Suisun marsh will reduce stressors. In a healthy ecosystem, stressors (ERPP, CALFED 1999) are relatively minor and kept in check by natural processes and adaptations of plants and animals inhabiting the system. In an impacted ecosystem, the natural processes no longer keep the stressors in check. The system and its inhabitants are forced into a widespread re-equilibration, which may result in lowered species diversity. San Francisco Bay/Delta is a prime example of an impacted system with a multitude of stressors, exemplified by the large number species and taxon that are under state/federal protection. These at-risk species include 10 invertebrates, 6 fish, 1 amphibian, 2 reptiles, 9 birds, 2 mammals, and 21 plants (CDFG 1998), for a total of 51 species. Suisun is subjected to stressors that can be grouped into three categories: altered hydrology, non-native species, and contaminants.

Altered Hydrology: The combination of levees that act to separate emergent wetlands from tidal flows and reclamation of emergent wetlands has altered ecological functions and processes in Suisun. Tidal exchange is the primary process that supports habitat function in healthy emergent wetlands. Reclamation/separation of wetlands from tidal flows has resulted in increased downstream flooding (Collins 1998), reduced floodplain filtering (Goals Project 1999), reduced water quality (Hammer 1989), altered sediment/soil chemistry, and direct habitat loss.

The size and capacity of the floodplain in Suisun have been greatly reduced, forcing water to rapidly exit the marshes and bays through confined channels and sloughs. While levees may protect reclaimed areas during normal water years, floods can devastate shoreline areas and result in adverse economic impacts due to loss of dampening effects provided by floodplain and flood basin storage. A fully functioning floodplain also acts as a water filter, allowing suspended sediments to settle out of the water column prior to reaching the Bay (Hammer 1989, Goals Project 1999). Many contaminants sorb to fine sediments and are now carried into the Bay because of the reduced flood basin storage, resulting in degraded water quality.

In addition, diking of baylands has had many adverse effects on soil/sediment chemistry and nutrient exchange. Without regular inundation, marsh sediments typically undergo oxidation which may result in changes in the biota occupying the area. Aerobic decomposition and dewatering of organic marsh soils, and a lack of sediment replenishment within the diked areas has resulted in a wide range of subsidence (Goals Project 1999).

Ecosystem processes and functions of tidal marsh in Suisun have been impaired by diking/reclamation. In fringing or narrow tracts of tidal marsh, sinuous, complex tidal drainage networks are not able to develop due to the insufficient area available. Losing these processes and functions has reduced habitat quality and quantity for native species of fish, wildlife, and plants (Herbold *et al.* 1992, Harvey *et al.* 1992). Miles of slough channels that provided feeding and spawning habitat for delta smelt, Sacramento splittail, and clapper rails have been lost. Transitional habitat between sloughs and upland areas were also lost, as were large tracts of adjacent native upland habitats. The transitional zone provides critical refugia for species such as California clapper rails, black rails, and salt marsh harvest mice during high tide events. Without these areas, rails and harvest mice are forced to use marginal habitat present on levees, greatly increasing the vulnerability of adults and young to predators. In addition, insect and plant diversity are highest near upland transitional zones. Many of the plant species which are at-risk in Suisun prefer relatively well-drained marsh/upland transitional habitats. The status of Suisun thistle and soft bird's beak are highly critical. There is one remaining viable population of Suisun thistle. Eight of ten remaining populations of soft bird's beak in Suisun are restricted to approximately 31 acres of habitat.

Nonnative Species: Alterations in ecosystem structure/function provide opportunities for establishment of non-native species. Introduction of nonnative species to an ecosystem may result in increased competition, predation, or community alterations, and may have impacts on the entire foodweb of the system. For example, the introduced Asian clam (*Potamocorbula amurensis*) has

proven to be successful in the San Francisco Bay/Delta ecosystem, and has outcompeted native species in certain areas and resulted in reduced primary productivity of the foodweb. The Asian clams are efficient in filtering algae from the water and reduce the crop of phytoplankton available for native species such as delta smelt larvae (USFWS 1995).

The introduction of non-native plant species may also have complex adverse effects on the ecosystem. Pepperweed (*Lepidium latifolium*) is highly invasive and poses a severe threat to Suisun thistle because they grow in the same elevational zone. Once pepperweed becomes established on dikes, it can easily colonize fringe tidal marsh and outcompete native species. Pepperweed also decreases quality of nesting habitat for native species such as clapper rail.

Contaminants: In Suisun, contaminant sources include municipal, industrial, and agricultural discharges. The Regional Monitoring Program (RMP) has monitored toxics levels in water, sediment, and bivalves throughout San Francisco Bay since 1992. Their results indicate widespread elevated levels of chromium, copper, and mercury in the system (SFEI 1999). Methylmercury production is a concern in restoring tidal wetlands. Research has shown that the majority of methylation occurs in the top 4 cm. of sediments (Devereux *et al.* 1996). Organochlorine pesticides are also a concern. Research suggests that contaminated sediment particles are washed into Suisun from the Central Valley during winter storm events (SFEI 1999). These contaminants may impact habitats and species through direct toxicity, indirect or sublethal toxicity, or bioaccumulation. Indirect effects typically include aspects of reduced fitness that are manifested by reduced growth rates, fecundity, and survival. Bioaccumulation occurs with contaminants such as mercury, and results in higher concentrations contained in the tissues of successively higher trophic level organisms. The effects of contaminants - direct, indirect, and bioaccumulation - all result in alterations in the foodweb and may reduce productivity and diversity of the ecosystem.

_____b. *Project Type.* This proposal is for research on and restoration of tidal marsh in accordance with the SCIP, and is a pilot study to demonstrate its feasibility. The SCIP is in the initial stages of development; signing of the supporting documentation and participation agreements by the five agencies is anticipated by December 2001. At the time funding is awarded to the 2001 CALFED applicants, no studies will have been initiated to test the approach contained in the SCIP. Therefore, this project is a pilot project to demonstrate that the approach outlined in the SCIP is feasible, practical, and practicable.

Because there are numerous other tidal marsh restoration efforts in varying stages around San Francisco Bay, there is a large pool of available data that will be utilized by this project (please see *Supporting Studies*).

_____c. *Hypotheses Testing and Uncertainties.* Our **hypothesis** is that restoration of the full tidal marsh ecosystem (including sloughs, low, middle, and high marsh zones) will benefit at-risk species. To test that hypothesis, we would conduct numerous studies as detailed under section 1b. Study plans will be designed to provide data on four CALFED **uncertainties**: channel dynamics, shallow water marsh formation, upland/transition zone formation, and water quality.

Detailed studies will be conducted to determine the effects of levee breaching on channel dynamics, salinity changes within Suisun and the Delta, effects of levee breaching on the formation of sloughs within the restored parcel, the amount of time required for the formation of shallow water marsh and upland transition zones, sediment chemistry changes within the restored area(s), and alterations in biotic composition will be developed in Phase II and refined in Phase III. Emphasis will be placed on studies of the length of time required for habitat formation and occupation, particularly by at-risk species. Data from these studies will be incorporated into management actions for the acquired area(s), and shared with other restoration projects within San Francisco Bay. Strategies for eliminating or minimizing ecosystem stressors, including control of nonnative species, will be included in the restoration and management plan that will be developed during Phases II and III of this project. Success standards/criteria and remedial measures for terrestrial and aquatic habitat development, fish and wildlife colonization, and nonnative species control will be included in the restoration and management plan.

Pre-project monitoring will be conducted in Phase II while the restoration plan is being developed, and will include presence/absence surveys of vegetation, fish and wildlife occurrence on acquired parcel(s) to assist in Phase III completion of environmental compliance documentation. We will coordinate pre-restoration monitoring with ongoing efforts in the area, such as annual salt marsh harvest mouse trapping conducted by DFG and DWR and California clapper rail and black rail monitoring conducted by DFG. Pre-project monitoring will provide a baseline against which comparisons may be made during and after restoration is complete.

Information provided by hypothesis testing studies will be used in **adaptive management** of the project. The proposed project will utilize existing data previously collected by restoration efforts at Carl's Marsh, Sonoma Baylands, and Tolay Creek. We also will use data from three habitat improvement efforts currently underway within Suisun: Hill Slough Restoration (DFG), ECAT Restoration (DWR), and data resulting from CALFED's Levee Investigation Study. Results of studies designed by these restoration projects (particularly those within Suisun) will be incorporated into our project, and our design and management will be altered as appropriate. In addition, any data gathered during the course of our proposed project will be shared with other restoration efforts around San Francisco Bay. Because our project is a collaboration between DFG, DWR, SRCD, FWS, and BR, the platform/framework for sharing data is already in use. People involved in the Hill Slough and ECAT restoration efforts and Levee Investigation are involved in the SCIP, attend SCIP meetings, and use the established e-mail reflector.

3. Approach

Our approach is to acquire land through fee title/conservation easement and restore it to self-sustaining tidal marsh through restoring natural elevation gradients and breaching/removing dikes to restore the full tidal prism. This project will be conducted in five phases. We are requesting funding to complete Phases I and II. If funds are available after land acquisition is complete due to lower-than-anticipated costs, we will use the remaining balance to initiate Phase III.

Phase I: We will acquire up to 500 acres of land in Suisun Bay in either fee title or conservation easement. Parcels in northern or western Suisun Bay will be targeted, with the exact location dependant upon willing sellers. The choice of this area for restoration was based upon the high potential benefit for native and at-risk species, contiguity with non-urban or similarly-managed lands, the low potential for conflict with neighboring land use, the low risk of downstream flooding, and the low risk of negative salinity changes. We will use the ECAT list of selection criteria (see Attachment 2) to identify parcel(s) that are appropriate for tidal marsh restoration. Parcels must have the potential to include all features of a fully functional, self-sustaining tidal marsh including tidal sloughs and low, middle, and high marsh zones.

The SRCD, DFG, or DWR will notify landowners of our interest in acquiring lands and obtain permission to access areas prior to conducting any appraisals. Prices offered for parcels will be in compliance with state land acquisition standards and procedures. Land will be purchased only from willing sellers, and offers made will be based on an approved appraisal and existing market value. DFG, DWR, or SRCD will hold all fee title(s)/conservation easement(s) resulting from this project, with specific agency selection dependant upon proximity to existing holdings. The current fair market value in this area is approximately \$1,500/acre.

Phase II: Upon acquisition, we will conduct pre-restoration surveys to provide a baseline and aid with preparation of environmental compliance documents. We will use existing agency protocols wherever possible and expand upon existing DWR and DFG efforts in Suisun. A consultant with extensive experience in the field of tidal marsh restoration will be contracted to perform a hydrologic evaluation and topographic survey and to develop a conceptual model restoration plan for the acquired area(s). We will use all available expertise in successful tidal marsh restoration within the five agencies to review and provide comments on the restoration plan and ensure that the project follows the SCIP.

SRCD and DWR will be the lead for obtaining local participation, which will be actively solicited through outreach efforts. All applicant agencies will participate in environmental compliance procedures such as NEPA/CEQA and 404 documentation for this project. We will work with the neighboring landowners to develop a plan which is mutually beneficial and does not place them at increased risk from either flood flows or reduced water quality.

Phase III: All environmental documents will be prepared in compliance with CEQA, NEPA, and the ESA, which will provide an appropriate framework for public involvement. An engineering or construction-level restoration design will be developed, and implementation cost estimates will be refined. A section 404 CWA permit will be pursued through the Corps of Engineers. Comprehensive physical, chemical, vegetation, invertebrate, fish, and wildlife monitoring protocols will be developed, and detailed pre-project monitoring and studies will be initiated. Existing agency protocols will be used whenever possible. Vegetation surveys will follow the Suisun Marsh Wide Vegetation Survey Protocol (Keeler-Wolfe 1999). Fish and wildlife surveys will include an emphasis on at-risk species, and will be conducted by permitted personnel.

This project is consistent with the Suisun Marsh Investigation (SMI) and current salt marsh harvest mouse and vegetation surveys and will provide an excellent opportunity to continue/expand them. Coordination of the restoration efforts and these ongoing studies will occur during phases II through V. For example, DWR currently monitors water quality at certain locations within Suisun. This effort could be expanded to include areas targeted by this proposal. Monitoring could continue throughout phases II through V of this project to determine the effects of the action(s) on salinity in Suisun. Results from any monitoring efforts will be incorporated into the management of the area(s), as part of the adaptive management plan.

Phase IV: The restoration plan will be implemented and adaptive management initiated. Post-project monitoring and studies will be initiated. To restore any of the areas to tidal action, a varying number of dikes would be breached or graded to slightly above tidal marsh plain elevations. Certain areas will be targeted for restoration of the full tidal prism and would ultimately become tidal marsh. The size and exact location of these alterations would be determined in consultation with civil engineers and surrounding land owners. Landward flood protection will be upgraded where necessary. Few conflicts with adjacent landowners are anticipated.

Depending upon the amount of subsidence which has occurred on the parcels, natural sedimentation would be used to achieve the appropriate elevation for recovery of tidal marsh. Deeply subsided lands will not be targeted due to the length of time required to restore elevations. The internal levees currently present may be used to further divide the restoration project into stages for studies of alternate restoration techniques. These studies would be designed in Phase III, along with studies to track alterations in sediment chemistry, salinity (as consistent with the SMI), and biotic community (particularly benthic organisms and at-risk species).

Phase V: The comprehensive monitoring program will be continued on the developing emergent wetland, and adaptive management used to manage the area. As results become available from studies and monitoring, progress of the project toward the goal of achieving a self-sustaining, fully functioning tidal marsh will be evaluated. Management plans will be flexible and allow for alterations to address any success criteria/standards that are not being met.

There are tradeoffs in restoring these areas to tidal marsh. While most of these areas are currently managed to support waterfowl, they are of limited use to at-risk fish such as Sacramento splittail. Currently, 52,000 acres of diked wetland are managed for waterfowl. Trapping results from some of these areas indicate that they are supporting salt marsh harvest mouse populations at higher densities than in nearby tidal wetlands. This proposal seeks to obtain diked parcel(s) for tidal restoration. To offset the loss of diked wetlands, these areas will need to be enhanced to increase their carrying capacity. The SCIP will contain provisions for managed wetland improvement.

Utility/Information Richness: This proposal is complementary to the proposal for the combined efforts of DWR, CDFG, SRCD, and BOR (as part of the SMPA) for restoration at Hill Slough and western Suisun (ECAT restoration). The projects that will be conducted during the

restoration efforts of both projects will provide needed data on the effects of levee breaching on channel dynamics, the effects of levee breaching on the formation of sloughs within the restored parcel, sediment chemistry changes within the restored area(s), and alterations in biotic composition. In addition, detailed studies will be conducted on sedimentation rates relative to the distance from Suisun Bay. This is critical information to have when designing restoration projects in that the elevation of the marsh plain will determine the rate and species of colonizing vegetation, and thus the amount of time required for the formation of shallow water marsh and upland transition zones. Knowledge of sedimentation rates at various locations around Suisun Bay will greatly facilitate the appropriate timing of future restoration/enhancement projects in both Suisun and San Pablo bays.

4. Feasibility

This project is feasible in that we have identified at least one potentially willing seller; additional willing sellers exist in Suisun. We will attempt to contact all landowners in our target areas to obtain a complete list of willing sellers through SRCD, DWR, and DFG. Parcels of all willing sellers will be evaluated relative to the ECAT selection criteria. However, actions toward purchasing any specific parcel(s) cannot begin until funding is received. We cannot identify the parcel(s) or reach agreement with sellers until funds are allocated due to rapid turnover of property once it becomes available. Obtaining grant funds prior to locating available property will allow us to approach willing sellers with funds that are immediately available and prevent any financial hardship that may otherwise be caused by waiting for grant approval and funds transfer.

The CEQA, NEPA, and 404 processes provide the framework for public participation and resolution of any implementation issues. We will solicit local input early and often, beginning with the initial contact to inform landowners of our interest in limited acquisition of parcels meeting the selection criteria.

5. Performance Measures

We have identified three targets associated with the three objectives identified in section 1a *Goals and Objectives*. Performance measures will be developed for each target as described below.

Objective 1. The target is acquisition, in fee title or conservation easement, of up to 500 acres of diked former bayland in northern/western Suisun within three years of receipt of funding. We will use a project activity/task checklist to track progress toward the target. Individual tasks will be metrics in that they may be tallied to determine progress. The detailed list is provided in section 8. *Work Schedule* and includes: landowner contact and access approval, appraisal, contaminant investigation, title search and escrow, property survey, and acquisition.

Objective 2. Our second major target is restoration of a self-sustaining, fully functioning tidal marsh. Because this will involve many different aspects of a tidal marsh, our Performance Plan will include the Monitoring Plans, Study Plans, Success Criteria, and Contingency Measures for physical, chemical and biological characteristics of both aquatic and terrestrial habitat development. Hypotheses identified in Section 1b will be tested. While these studies, monitoring,

and surveys will be conducted throughout the project (plus long-term monitoring after completion), we are dividing the description of the Performance Plan here into pre- and post-project portions for ease of explanation. Please note that the overall design includes multiple layers in the form of various studies and monitoring efforts, and interim targets in the form of initiation/completion dates and different types of surveys (presence/absence vs. detailed). Interim targets will help keep the project moving toward the target, as will adaptive management. As studies produce site-specific data, adjustment of land management techniques may be required.

Pre-project. Presence/absence surveys for at-risk species will be conducted during Phase I once the land acquisition process has begun, after obtaining access permission, and within 1.5 years of receipt of funding. The primary purpose of these surveys is to aid Phase III environmental compliance document completion, but results will also contribute to the Performance Plan. We will develop and implement a Monitoring Plan during Phase II and within 3 years of receipt of funding. Pre-project monitoring will provide the baseline upon which post-project monitoring evaluations will be made, and will be focused on environmental indicators. Pre-project monitoring, at a minimum, will include fish, waterfowl and shorebird, and wildlife surveys, plant surveys, aquatic invertebrate surveys in nearby sloughs (pending landowner permission), water quality (at least contaminants, physical parameters, and sediment load), and nonnative species occurrence. Biotic surveys will include community composition, distribution and abundance, population trends, and limiting factors for at-risk species.

Post-project. The Phase II Monitoring Plan will be the basis for post-project monitoring, although the Monitoring Plan may be refined in Phase III through additional planning and initial data generation by studies/surveys. The post-project Monitoring Plan will include studies of physical and chemical parameters associated with formation of tidal marsh such as slough/channel formation, sedimentation rates, and sediment chemistry in newly inundated areas; biological monitoring established in Phase II would continue. Quality assurance will be provided by success criteria and contingency measures that will be developed for the Performance Plan during Phase III. Success criteria will primarily involve physical features of the project site such as tidal prism, and sedimentation rate, as well as biotic components such as native vegetation colonization and invasive nonnative species occurrence. Control of invasive nonnative species is critical to the success of this project. Contingency Measures will be employed if success criteria are not being met within the specified timeframe.

We will incorporate existing studies/surveys/protocols whenever possible to facilitate data sharing and contribute to the larger knowledge base on Suisun. Ongoing efforts within Suisun include (1) DWR conducts periodic water quality monitoring, (2) DWR contracts UC-Davis to conduct fish surveys, (3) DWR and DFG conduct salt marsh harvest mouse monitoring, and (4) ECAT approved and DFG implements the recent Keeler-Wolfe (1999) vegetation survey protocol. Results from these efforts will be used to complement our site-specific monitoring on restored parcel(s).

Objective 3. Our third major objective is to assist/facilitate recovery of at-risk species; our target is colonization of the project area within 5 years of suitable habitat formation. Our metrics

for tracking progress toward this target are the surveys identified above. The plant, fish, and wildlife monitoring will contain focused surveys specifically designed for at-risk species that might not otherwise be detected during general surveys. We will conduct presence/absence surveys for at-risk species during phases I and II to assist with baseline development and environmental compliance documentation. We will develop detailed surveys specifically for at-risk species during Phases II and III; our focus will be on factors that limit species' distribution and abundance. Should initial surveys indicate absence of all at-risk species in the area, implementation of detailed surveys will most likely occur during Phase IV, after levees have been breached.

6. Data Handling and Storage

All generated data will be reported to the Sacramento Office of the U.S. Fish and Wildlife Service (Service) and shared with all applicant agencies. Ms. Carmen Thomas, Recovery Branch Chief with the Endangered Species Division of the Service will compile and store all data. All data will be collected with GIS coordinates to facilitate GIS data layer development. Project progress will be made accessible through the Suisun Charter/ECAT email reflector. The Service will provide hardcopies of the data to the public upon request.

7. Expected Products/Outcomes

The immediate outcome of this proposal will be: (1) acquisition, in fee title or conservation easement, of up to 500 acres in Suisun from willing seller(s), (2) reports from hydrologic and topographic surveying, (3) a conceptual restoration plan, and (4) reports from preliminary presence/absence surveys for at-risk species for use in Phase III environmental compliance documentation. Status reports will be delivered to CALFED within the required timeframe and made available through the Suisun Charter/ECAT email reflector.

The applicant agencies will compile information from the proposed studies and will present them at seminars and conferences such as the State of the Estuary and IEP. We will work together to analyze data generated by the studies developed in Phase III and develop manuscripts for submission to scientific journals.

The future outcome of the entire project will be the restoration and protection in perpetuity of that acreage to tidal marsh consistent with the CALFED ERPP, the Suisun Marsh Protection Plan, the Suisun Marsh Investigation, the Goals Project (1999), and the Recovery Plan for Sacramento/San Joaquin Native Fishes (1995).

8. Work Schedule

The following tasks are needed to complete Phases I and II and are anticipated to occur within three years of receipt of funding. Phases III - V will be the subject of future proposal submissions to CALFED and other funding sources.

Phase I

- Task 1. Public notification, property location (willing seller only) and evaluation relative to selection criteria. Completion date: within 1.5 years of receipt of funding.
- Task 2. Surveys and appraisal. Completion date: within 8 months of property location.
- Task 3. Land Acquisition. Completion date: within 2 years of receipt of funding
- Task 4. Stewardship upon ownership, including control of nonnatives. Completion date: within 8 months of acquisition.
- Task 5. Project Management. Initiated upon receipt of funding, on-going throughout the length of the project. Deliverables include quarterly CALFED status reports.

Phase II

- Task 6. Develop pre-project monitoring plans. Completion date: within 3 years of receipt of funding.
- Task 7. Implement pre-project monitoring plan. Completion date: within 3 years of receipt of funding.
- Task 8. Develop conceptual restoration plan and cost estimate for implementation. Completion date: within 3 years of receipt of funding.
- Task 9. Project Management. See Task 5.
- Task 10. Begin environmental compliance and permitting. This is a Phase III activity that may be initiated in year 3.

Phase III will include completion of environmental compliance and permitting, development and implementation of detailed studies and monitoring plans, and development of construction/engineering level restoration plans. Phase IV will include implementation of the restoration plan, post-project studies, and monitoring; and adaptive management. Phase V will include continued post-project studies and monitoring, preparation and presentation of data from pre and post-studies. Project management will continue throughout the entire project.

Tasks 1 through 5 are inseparable. However, tasks 6 through 10 are critical to the success of the project, and we are requesting funding for tasks 1 through 10. Tasks 6-8 will be initiated immediately upon parcel(s) acquisition. Task 9 will also be initiated within the first three years of the project, should timing allow; this task is crucial to the continuation and successful completion of the project. Phases III through V will begin upon completion of Phases I and II. Project management is an on-going task that will continue throughout the project and provide CALFED status reports and coordination among the five applicant agencies.

B. Applicability to CALFED ERP and Science Project Goals and Implementation Plan and CVPIA Priorities

1. ERP, Science Program and CVPIA Priorities

Acquisition of parcel(s) in Suisun will improve the health of the Bay-Delta ecosystem, benefit numerous at-risk species, and yield broad ecosystem benefits. The project assists in achieving 5 of 6 CALFED ERP Goals and 7 of the Goal-related objectives (CALFED 1999) including:

Goal 1 – *Conservation and recovery of priority I - IV species*: Acquisition and restoration of land in Suisun to tidal emergent wetland would greatly contribute to the establishment of self-sustaining populations and recovery of at-risk species in Suisun and the Delta. Species which would benefit from restoration of land in Suisun Marsh include: Sacramento splittail, salt marsh harvest mouse, California black rail, California clapper rail, Suisun song sparrow, Mason's lilaeopsis, Suisun thistle, and soft bird's beak. Please see attachment 1 for full species list.

Goal 2 – *Rehabilitation of natural functions/processes in the Bay-Delta system*: Restoration of tidal influence to parcel(s) by levee alteration (breach or leveling) in Suisun would facilitate recovery of natural floodplains and flood processes by re-establishing regular inundation; aid in re-establishing a hydrodynamic regime that favors native species and natural habitats by providing nutrient exchange, foodweb support, and rearing habitat; and increase estuarine productivity by increasing acreage of productive shallow-water marshes and reducing turbidity in open-water regions of the estuary.

Goal 4 – *Protect and restore functional habitat*: Acquisition of land in Suisun Marsh is the first step toward achieving objectives 1, 3, and 4 for habitat, which include restoration of major habitat types in the Delta /Bay, and increasing the area of tidal marsh via levee breaching or removal.

Goal 5 – *Prevent establishment/reduce current adverse impacts of non-native species*: We will incorporate actions to reduce or eliminate negative impacts of currently present nonnative species and measures to prevent their future establishment into the long-term management strategy for this acquisition and restoration.

Goal 6 – *Improve and maintain water/sediment quality*: This project will restore the emergent wetland link between Suisun Bay and Marsh by breaching/removing levees and allowing full tidal influence. Emergent wetlands are an integral part of a healthy, functioning Delta/Bay ecosystem and provide settlement areas for sediment and filtering sediment-sorbed toxics from water prior to flows reaching the Bay.

We will support the **Science Program** by designing and implementing studies that will contribute to the body of knowledge on Suisun and tidal systems and facilitate increased effectiveness of future restoration efforts.

Performance Measures/Process Understanding/Uncertainties. Detailed performance measures, success criteria, and contingency measures will be developed in Phase III as part of the Performance Plan, and will be structured to include adaptive management experiments to enable us to refine our site management and enhance the efficiency of our restoration. The Phase III studies (briefly explained in section 1b and outlined in the budget) will be designed to increase our knowledge of the physical, chemical, and biological processes involved in restoring/developing tidal marsh habitats. Study plans will be designed to provide data on four CALFED uncertainties: channel dynamics, shallow water marsh formation, upland transition zone formation, and water quality. Studies to determine the effects of levee breaching on channel dynamics, the effects of

levee breaching on the formation of sloughs within the restored parcel, the amount of time required for the formation of shallow water marsh and upland transition zones, sediment chemistry changes within the restored area(s), and alterations in biotic composition will be developed in Phase III.

Population Models. This project will contribute to knowledge of at-risk species and others by determining their response to the project (*e.g.* recolonization and population growth rates). Studies developed in Phase III will focus on factors that are limiting the distribution/abundance of at-risk species, and will include quantitative metrics to facilitate population modeling. Depending on the suitability of the parcel, repatriation/introduction experiments may be conducted for selected at-risk plants (Suisun thistle and soft bird's beak).

Integrated Program/Coordination. Wetland restoration must be an integrated action encompassing the fields of hydrology, biology, chemistry, engineering, and ecology. Projects conducted in laboratory settings do not always provide accurate depictions of complex interactions and responses that are present in the field. The proposed pilot project would be conducted in the field. It is also an integrated program in that there are 5 applicant agencies involved that would guide and conduct the project. Each agency has slightly different areas of expertise; this combination of experience will provide a well-rounded approach to consideration and resolution of future issues. DFG and DWR are currently conducting monitoring efforts in Suisun; FWS, SRCD, and BR are also involved in these efforts. This project presents a unique opportunity to coordinate all 5 agencies' actions across a large area (Suisun). In doing so, we would use existing data from ongoing studies and restoration efforts within Suisun and San Francisco Bay to maximize the efficiency of our project.

This project supports the objectives of the **CVPIA** in that it seeks to protect and restore fish and wildlife habitat in the Bay/Delta system. Land acquisition and habitat restoration in Suisun are consistent with CVPIA Biological Resource Considerations, targeting at-risk species for protection and conservation, enhancing water quality in the Bay, and providing long term benefits for multiple species. Protection and eventual restoration of Suisun will contribute to the long-term restoration of the Bay/Delta ecosystem.

2. Relationship to Other Ecosystem Restoration Projects

Land protection and restoration in Suisun will complement and enhance region-wide efforts to preserve and restore ecosystems and landscape corridors. Other restoration projects in Suisun include restoration of approximately 200 acres along Hill Slough by DFG. The Hill Slough project is applying for Phase III funding; to date they have developed restoration plans and initiated environmental compliance documents. SMPA Agencies received CALFED funding for land acquisition and eventual tidal marsh restoration in Suisun in 2000 (ECAT restoration). Due to complications with land acquisition, parcel(s) have not yet been acquired, but the targeted area is northwestern Suisun. In addition, DWR and SRCD are currently considering a proposal to convert seasonal managed wetlands on lower Joice Island to microtidal lagoons to demonstrate

self-sustaining waterfowl habitat management techniques. A proposed project for restoration of 2,300 acres along the east shore of Montezuma Slough is in planning and permitting, as is a project to restore 131 acres along Baypoint Shoreline in south Suisun Bay. A companion proposal from the Fishery Foundation of California is requesting the acquisition and restoration of 420 acres on Chipps Island in eastern Suisun.

One of the selection criteria we will use in selecting parcel(s) from willing sellers will be proximity to existing fully-functional tidal marsh or proximity to lands targeted by other projects for restoration to tidal marsh. Parcels that are adjacent to existing tidal marsh will be given highest priority for acquisition because restoration of these areas will add to tidal marsh contiguity within Suisun.

To date, the five applicant agencies are those involved in implementing the SCIP and have been the major players in proposals for tidal marsh restoration in Suisun. Therefore, the platform exists to share data and lessons learned easily among the major players in tidal marsh restoration within Suisun.

3. Requests for Next-Phase Funding/Previous Recipients of CALFED/CVPIA Funding

This proposal is for the first two phases of a new project. No funding for this project has been previously requested from either CALFED or CVPIA.

4. System-Wide Ecosystem Benefits

The implementation of this project, in combination with those previously mentioned will improve the health of the ecosystem in Suisun. The proximity of the area targeted in this proposal to other restoration projects currently under development will greatly increase their value to fish and wildlife. Please also see section B2.

5. Additional Information for Land Acquisition Proposals

As stated throughout the proposal, we will attempt to contact all local landowners and inform them of our interest in obtaining land for restoration to tidal marsh. We will evaluate ONLY those parcels owned by willing sellers. SRCD will ensure that the location of our project is consistent with local general plans. We will prioritize acquisition of diked seasonal lands. We will use the ECAT selection criteria to determine the optimum parcel(s) for restoration to ensure that connectivity, biological richness and historical importance, and feasibility are maximized. We will begin to notify local landowners of our interest upon securing funding, and we will begin the selection and acquisition process upon receiving funding.

C. Qualifications

The primary staff members involved in implementation of this project will be:

U.S. Fish and Wildlife Service

Carmen Thomas: Chief, Recovery Branch, Endangered Species Division

Education/Experience: B.S. in Wildlife Ecology; M.S. in Wildlife Biology with a minor in Toxicology. Over 4 years in various issues related to San Francisco Bay, including contaminant studies and endangered species consultations/biological opinions, permitting, studies, and recovery.

Cecilia Brown: Fish and Wildlife Biologist, Coast/Bay/Delta Branch, Endangered Species Division

Education/Experience: B.S. in Biological Sciences. Over 5 years in endangered species issues in Suisun and San Francisco Bay. Active participant in the Suisun Charter group since 1999.

Department of Water Resources

Terri Gaines: Environmental Specialist IV, Suisun Marsh Branch, Environmental Services Office

Education/Experience: B.A. in Social Ecology with emphasis on Environmental Planning; Graduate work in Watershed Management. Over 8 years in Suisun coordinating planning and restoration activities, preparing environmental documentation and permits. Lead of CALFED funded ERP project for land acquisition and tidal restoration in Suisun. Facilitator, SMPA ECAT. Contract manager for SPMA Individual Ownership Management Plan Cost-Share Program.

Chris Enright: Senior Engineer, Chief, Suisun Marsh Planning Section

Education/Experience: B.S. in Environmental Engineering; Professional Engineer, Civil Engineer. Responsible for evaluation and engineering analysis of salinity control measures in Suisun. Assists Suisun Levee Investigation Team in modeling. Over 12 years experience planning, leading and implementing modeling analyses of hydrodynamics and water quality in the Delta.

Curt Schmutte: Chief, Suisun Marsh Branch, B.S. in Civil Engineering. Mr. Schmutte has managed more than \$50 million in Delta flood control and habitat development projects, and was the program manager for the Levee System Integrity component of CALFED.

Suisun Resource Conservation District

Steven Chappell: Executive Director

Education/Experience: B.S. in Biological Science, Minor Chemistry. SRCD represents and assists Suisun Marsh private landowners at federal, state, and local levels. Mr. Chappell has participated in numerous Suisun Marsh planning and regulatory programs including the Baylands Ecosystem Goals Project, the Suisun Ecological Workshop, Suisun Marsh Environmental Coordination Advisory Team, and the Suisun Marsh Charter Process. On a daily basis, the SRCD assists landowners in the implementation of various Suisun Marsh wetlands restoration and enhancement projects, seasonal wetland management, maintenance of water control facilities, and landowner education of beneficial programs and property management techniques.

Department of Fish and Game

Carl Wilcox: Habitat Conservation Manager, Central Coast Region

Education/Experience: B.S. Biological Conservation, M.S. Biology. Manager for Central Coast Region's Habitat Conservation Planning Program. Responsible for environmental review, landscape planning, water quality and endangered species programs within the region. Co-chair of the Baylands Ecosystem Goal Project. Over 20 years of experience in wetland management and restoration.

Frank Wernette: Environmental Program Manager I, Bay-Delta and Special Water Projects Division

Education/Experience: B.S. in Wildlife Management. Supervisor of the Water Project Planning and Evaluation Unit. Responsible for the evaluation of proposed State Water Project water storage and conveyance projects throughout the State. Over 25 years experience in Suisun issues.

U.S. Bureau of Reclamation

Lee Laurence: Special Projects Officer, Resources Management Division

Education/Experience: B.A. in Social Science. Over 35 years experience in California water resource issues.

The SRCD, DWR, DFG, FWS, and BR are uniquely qualified to identify, acquire, restore, and protect these lands. Certain portions of the work may be contracted, depending upon priorities and existing work loads. There are no known conflicts of interest with parties involved in this project.

D. Cost

1. Cost Sharing

The SCIP will guide the Levee Program implementation and ecosystem management in Suisun. Funding currently exists for the levee components of the SCIP. Preliminary modeling data show that catastrophic dike breaches in southern Suisun may cause significant increases in Delta water salinity. The CALFED levee program has determined that certain dikes in Suisun should be maintained as part of the program to protect water quality in the Delta, and is sharing the cost of habitat management. DFG has received \$3.2 million from DWR and BR for implementation of the Suisun Marsh Mitigation Agreement (SMMA), but funds are still needed for the multi-species management/ecosystem restoration component of the SCIP. While it may be possible to use some levee program or SMMA funds for tidal marsh restoration, these funds were negotiated to be used for waterfowl maintenance. The SMPA Negotiation Team would have to determine all changes to this agreement. We are requesting funds for the tidal restoration component of the SCIP.

Additional cost sharing may be available in the form of Endangered Species Section 6 grants. Section 6 grants are available for studies on at-risk species. Repatriation/introduction studies on listed plants described above would be appropriate to submit for Section 6 funding. Upon securing funding, we will begin developing proposals to submit to this competitive process.

E. Local Involvement

Letters have been sent to Solano County Planning Commission and Bay Conservation and Development Commission. In addition, the Coastal Conservancy and Solano County Open Space District have been contacted via telephone regarding our intent to submit this proposal.

The Suisun Resource Conservation District is a co-applicant for this proposal and will be the lead agency for local public involvement. Updates of the project will be presented at monthly meetings of the SRCD Board of Directors. Once funding is secured, public outreach will occur to describe the project and provide information to potential willing sellers. This project will consider only willing sellers. Briefings occur in one-on-one meetings, group meetings, or by mailing. FWS and SRCD maintain a mailing list of numerous individuals, agencies, news media, and other organizations which receive routine updates and other mailings. The adjacent landowners and others will continue to have publicized opportunities to make comments for the EIS (Phase III) for acquired lands.

F. Compliance with Standard Terms and Conditions

All terms and contracts will be submitted to CALFED after receipt of funds. The applicant agencies are not aware of any potential conflicts of interest.

With regard to State Proposition 204 Terms and Conditions, DFG and DWR assume that a Standard Interagency Agreement shall be used in drafting this agreement, which shall not include an indemnification provision should federal funds be used.

The Service cannot agree to a standard clause requested for State funded projects. The Terms and Conditions for State Proposition 204 Funds, Section 3, states "Performance Retention: Disbursements shall be made on the basis of costs incurred to date, less ten percent of the total invoice amount. Disbursement of the ten percent retention shall be made either: (1) upon the Grantee's satisfactory completion of a discrete project task (ten percent retention for task will be reimbursed); or (2) upon completion of the project and Grantee's compliance with project closure requirements specified by CALFED (ten percent retention for entire project will be disbursed)".

The Services's authorization to enter into agreements with non Federal entities was changed in FY 2000. Our FY2000 Appropriations bill authorizes the Service to enter into contracts with State agencies when advance payment to the Service is not possible. In accordance with the requirements imposed by Congress in the FY2000 Appropriations bill and report language, the Services Director must approve a project when advance payment is not possible and certify that payments will be made in full by the State within 90 days after the Service issues an invoice.

Specifically, the 10% retention clause cannot allow timely payments for the following reasons: In our Federal Financial System (FFS) accounting program, a periodic invoice (either quarterly or monthly depending on the terms of the contract) is automatically issued from our finance center

based on actual expenditures of the Service on a project. Invoices include a payment due date on the invoice and when payment is not received in full by that due date, the system automatically shows the unpaid balance as delinquent. Depending on how delinquent the payment is, interest, penalty and administrative charges may also accrue. With 10% retention withheld on each invoice, the 10% retention amount then causes applicable invoice record in FFS to be partly delinquent and remain delinquent until the project or individual tasks identified in the contract are completed and the retention is released.

The Service's Finance Center must report to the Department of Treasury if the Service is owed funds by any entity. Therefore, when accounts remain delinquent due to the 10% retention of payments owed the Service, that delinquency continues to be reported to Treasury. The Service has previously entered into agreements with the State of California that do not contain the 10% retention clause. We have asked the State's Deputy Attorney General to provide clarifying guidance to the Department of Water Resources that is general in scope, which can also be applied to contracts related to the CALFED program. Our offices will continue to work with the State closely on State funded projects. If the State is not satisfied with the work performed by the Service, the State project manager should contact the Service's project manager to correct the performance problem. If needed, upon notification interim billings can be canceled until the State is satisfied with the Service's performance. We can comply with all other State and Federal standard clauses.

G. Literature Cited

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Attachment 1. Species to benefit from restoration of tidal marsh in western and northern Suisun Marsh.

Common Name	Latin Name	Status ^a	Life Stages ^b
salt marsh harvest mouse	<i>Reithrodontomys raviventris halicoetes</i>	E	all
Suisun ornate shrew	<i>Sorex ornatus sinuosis</i>	SC	all
California least tern	<i>Sterna antillarum browni</i>	E	adult
American bittern	<i>Botarus lentiginosus</i>	SC	all
saltmarsh common yellowthroat	<i>Geothlypis trichas sinuosa</i>	SC	all
Suisun song sparrow	<i>Melospiza melodia maxillaris</i>	SC	all
delta smelt	<i>Hypomesus transpacificus</i>	T	egg, juvenile
Sacramento splittail	<i>Pogonichthys macrolepidotus</i>	T	egg, juvenile
green sturgeon	<i>Acipenser medirostris</i>	SC	all
Pacific lamprey	<i>Lampetra tridentata</i>	SC	adult
long fin smelt	<i>Spirinchus thaleichthys</i>	SC	egg, juvenile
Suisun thistle	<i>Cirsium hydrophilum</i> var. <i>hydrophilum</i>	E	na ^c
soft bird's beak	<i>Cordylanthus mollis</i> subsp. <i>mollis</i>	E	na
Suisun Marsh aster	<i>Aster lentus</i>	SC	na
alkali milk-vetch	<i>Astragalus tener</i> var. <i>tener</i>	SC	na
heartscale	<i>Atriplex cordulata</i>	SC	na
brittlescale	<i>Atriplex depressa</i>	SC	na
delta tule pea	<i>Lathyrus jepsonii</i> var. <i>jepsonii</i>	SC	na
Mason's lilaeopsis	<i>Lilaeopsis masonii</i>	SC	na

^a E = Endangered, T = Threatened, SC = Species of Concern

^b Life stage of organism which would benefit from restoration of areas in eastern Portrero Hills

^c na = not applicable

SUISUN MARSH ACQUISITION PROPOSALS
Score Sheet

CRITERIA		Property 1	Property 2	Property 3	Property 4
Costs					
	Acquisition Costs				
	Development Costs				
	Operation and Maintenance Costs				
Physical Features					
	Transition Zone				
	Historical Tidal Features				
	Proximity to Existing Tidal Areas				
	Exterior Levees				
	Interior Levees				
	Access				
Fish and Wildlife Evaluations					
	Salt Marsh Harvest Mouse				
	California Clapper rail				
	Delta Smelt				
	Chinook Salmon				
	Other Aquatic Species				
	T & E Plants				
	Multi-Species Benefits				
	Other species of concern				
	Vernal pools				
	Other habitats				
Other					
	Salinity Effects				
	Supported by other agencies/groups/recovery plans				
	Consistent with CALFED levee invest. team findings				
	Other				
Total Score					

Property Description

Club Name	_____	Asking Price	_____
Ownership Number	_____	Total Acreage	_____
		Wetland	_____
Primary Contact	_____	Upland	_____
Phone	_____	Other	_____
		Cost per Acre	_____
Property Location	_____		
Adjacent Sloughs	_____		
Restoration goal of this parcel	_____		

Proximity and description of existing tidal areas	_____		

Elevation of parcel/subsidence	_____		

Adjacent properties (how many, potential for future acquisition, flood liability)	_____		

Levees	_____		
	Length of Interior Levees to upgrade and maintain	_____	
	Length of exterior levees to upgrade and maintain	_____	
	Extent of rehabilitation required	_____	
Access for construction/maintenance	_____		
Facilities (including clubhouse, other structures, water control and pumps)	_____		

Existing Land Use (include land features, how extensively managed)	_____		

Existing vegetation on parcel (diversity, critical habitat, sensitive species)	_____		

Evaluate loss of existing habitat function (describe existing habitat, vegetation)	_____		

Additional pertinent information	_____		

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Phase 1										(indirect)			
2	Task No.	Task Description	Labor Hours	Salary/Benefits	Personnel	Travel	Supplies/Expendables	Services/Consultants	Equipment	Subtotal	Overhead	Acquisition	TOTAL	indirect
3	1	Public involvement	300	79	23700					23700	20		28440	4740
4	2a	Appraisal	320	79	25280					25280	20		30336	5056
5	2b	Title Search, Escrow, Deed Recording	115	79	9085					9085	20		10902	1817
6	2c	Property survey			0			20,000		20000	4.5		20900	900
7	2d	Relocation						50,000		50000	4.5		52250	2250
8	2e	Contaminant survey	60	71.25	4275	200				4475	20		5370	895
9	3	Document Review and Negotiation	350	71.25	24937.5					24937.5	20		29925	4987.5
10	4a	Acquisition			0					0		750000	750000	0
11	4b	Stewardship/nonnative control	100	71.25	7125			10000		17125	20		20550	1875
12	5	Owner due dilligence	50	79	3950					3950	20		4740	790
13	6	Project Management	400	71.25	28500					28500	20		34200	5700
14		Subtotals			126852.5	200	0	80000		207052.5		750000	987613	
15	Phase 2													
16	Task No.	Task Description	Labor Hours	Salary/Benefits	Personnel	Travel	Supplies/Expendables	Services/Consultants		Subtotal	Overhead	Equipment	TOTAL	
17	6	Develop pre-project monitoring plan	320	79	25280			25000		50280	20		60336	10056
18	7	Implement pre-project monitoring plan	1440	79	113760					113760	20		136512	22752
19	8a	Develop conceptual restoration plan	480		0			50000		50000	4.5		52250	2250
20	8b	Hydrologic study	320					45000		45000	4.5		47025	2025
21	8c	Topographic study	160					20000		20000	4.5		20900	900
22	9	Project Management	400	71.25	28500					28500	20		34200	5700
23	10	Begin Environmental Compliance	250		0			20000		20000	4.5		20900	900
24		Subtotals		229.25	167540	0	0	160000		327540		0	372123	
25	Phase 3													
26	Task No.	Task Description	Labor Hours	Salary/Benefits	Personnel	Travel	Supplies/Expendables	Services/Consultants		Subtotal	Overhead	Equipment	TOTAL	
27	11	Complete environmental compliance	750	79	59250			60000		119250	4.5		124616.3	5366.25
28	12	Develop detailed studies/monitoring pla	400	79	31600					31600	20		37920	6320
29	13	Continue pre-project studies/monitoring	5120	71.25	364800					364800	20		437760	72960
30	14	Develop construction/engineering resto	600		0			48000		48000	4.5		50160	2160
31	15	Project Management	400	71.25	28500					28500	20		34200	5700
32		Subtotals		300.5	484150	0	0	108000		592150		0	684656.3	
33	Phase 4													
34	Task No.	Task Description	Labor Hours	Salary/Benefits	Personnel	Travel	Supplies/Expendables	Services/Consultants		Subtotal	Overhead	Equipment	TOTAL	
35	16	Implement restoration plan			0			500000		500000	4.5		522500	22500
36	17	Implement post-project studies/monitoring			0			400000		400000	4.5		418000	18000
37	17a	Channel development studies						60000						
38	17b	Water quality studies						70000						
39	17c	Benthic fauna studies						55000						
40	17d	Fish and wildlife studies						211000						
41	17e	Vegetation studies						45000						
42	18	Begin adaptive management	500	79	39500					39500	20		47400	7900
43	19	Project Management	350	71.25	24937.5					24937.5	20		29925	4987.5
44		Subtotals		150.25	64437.5	0	0	1341000		964437.5		0	1017825	
45	Phase 5													
46	Task No.	Task Description	Labor Hours	Salary/Benefits	Personnel	Travel	Supplies/Expendables	Services/Consultants		Subtotal	Overhead	Equipment	TOTAL	
47	20	Continue post-project studies/monitoring			0			100000		100000	4.5		104500	4500
48	21	Prepare and present findings from stud	600	71.25	42750					42750	20		51300	8550
49	22	Project Management	300	71.25	21375					21375	20		25650	4275
50		Subtotals		142.5	64125	0	0	100000		164125		0	181450	