

4.5 PSP Cover Sheet (Attach to the front of each proposal)

Proposal Title: Reintroduction of Endangered Soft Bird's Beak to Restored Habitat Suisun
 Applicant Name: Eliska Rejmankova
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Amount of funding requested: \$ 148,627.00 for 2 years

Indicate the Topic for which you are applying (check only one box).

- | | |
|---|---|
| <input type="checkbox"/> Fish Passage/Fish Screens | <input type="checkbox"/> Introduced Species |
| <input checked="" type="checkbox"/> Habitat Restoration | <input type="checkbox"/> Fish Management/Hatchery |
| <input type="checkbox"/> Local Watershed Stewardship | <input type="checkbox"/> Environmental Education |
| <input type="checkbox"/> Water Quality | |

Does the proposal address a specified Focused Action? x yes no

What county or counties is the project located in? SOLANO (Napa, Contra Costa)

Indicate the geographic area of your proposal (check only one box):

- | | |
|---|---|
| <input type="checkbox"/> Sacramento River Mainstem | <input type="checkbox"/> East Side Trib: _____ |
| <input type="checkbox"/> Sacramento Trib: _____ | <input checked="" type="checkbox"/> Suisun Marsh and Bay |
| <input type="checkbox"/> San Joaquin River Mainstem | <input type="checkbox"/> North Bay/South Bay: _____ |
| <input type="checkbox"/> San Joaquin Trib: _____ | <input type="checkbox"/> Landscape (entire Bay-Delta watershed) |
| <input type="checkbox"/> Delta: _____ | <input type="checkbox"/> Other: _____ |

Indicate the primary species which the proposal addresses (check all that apply):

- | | |
|--|--|
| <input type="checkbox"/> San Joaquin and East-side Delta tributaries fall-run chinook salmon | <input type="checkbox"/> Spring-run chinook salmon |
| <input type="checkbox"/> Winter-run chinook salmon | <input type="checkbox"/> Fall-run chinook salmon |
| <input type="checkbox"/> Late-fall run chinook salmon | <input type="checkbox"/> Longfin smelt |
| <input type="checkbox"/> Delta smelt | <input type="checkbox"/> Steelhead trout |
| <input type="checkbox"/> Splittail | <input type="checkbox"/> Striped bass |
| <input type="checkbox"/> Green sturgeon | <input type="checkbox"/> All chinook species |
| <input type="checkbox"/> Migratory birds | <input type="checkbox"/> All anadromous salmonids |
| <input checked="" type="checkbox"/> Other: <u>Special Status Plants</u> | |

(Soft Bird's Beak, Black Rail)

Specify the ERP strategic objective and target (s) that the project addresses. Include page numbers from January 1999 version of ERP Volume I and II:

Restore at risk tidal marsh plants (p.274, ERP VII); Recovery of black rail
(p.249, ERP VII), Tidal saline emergent wetland habitat (p.133, ERP V.II);
Recovery of Suisun song sparrow (p.255, ERP V.II); links to B-D food web (p.155,
ERP V.II)

Indicate the type of applicant (check only one box):

- | | |
|--|---|
| <input type="checkbox"/> State agency | <input type="checkbox"/> Federal agency |
| <input type="checkbox"/> Public/Non-profit joint venture | <input type="checkbox"/> Non-profit |
| <input type="checkbox"/> Local government/district | <input type="checkbox"/> Private party |
| <input checked="" type="checkbox"/> University | <input type="checkbox"/> Other: _____ |

Indicate the type of project (check only one box):

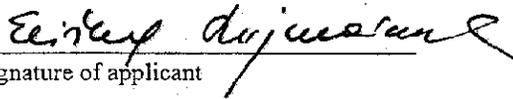
- | | |
|--|---|
| <input type="checkbox"/> Planning | <input type="checkbox"/> Implementation |
| <input type="checkbox"/> Monitoring | <input type="checkbox"/> Education |
| <input checked="" type="checkbox"/> Research | |

By signing below, the applicant declares the following:

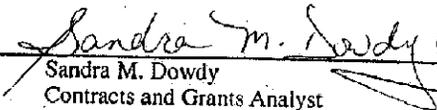
- 1.) The truthfulness of all representations in their proposal;
- 2.) The individual signing the form is entitled to submit the application on behalf of the applicant (if the applicant is an entity or organization); and
- 3.) The person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section 2.4) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Eliska Rejmankova, Associate Professor

Printed name of applicant



Signature of applicant


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**REINTRODUCTION OF ENDANGERED SOFT BIRD'S BEAK
TO RESTORED HABITAT IN SUISUN MARSH:
RESTORATION STRATEGIES FOR RARE PLANT AND
TIDAL MARSH COMMUNITY RECOVERY**

PREPARED IN RESPONSE TO:

CALFED BAY-DELTA PROGRAM
Ecosystem Restoration Projects and Programs
Proposal Solicitation Package
February 1999

Principal Investigator:

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Type of Organization: University

Project Participants/Collaborators:

Implementation: Eliska Rejmankova, Associate Professor and Wetland Ecologist; Brenda J. Grewell, Wetland Ecologist and UC Davis Ecology doctoral candidate; Jian Huang, Laboratory Technician, UCD Wetland Research Laboratory; Wetland Research Laboratory Student Assistants; and Dr. Pamela Muick, Exec. Director and Restoration Ecologist, Solano Farmlands and Open Space Foundation.

Peer Review/Guidance: Diana Hickson, Dept. of Fish and Game; Peter Baye, U.S. Fish and Wildlife Service Endangered Species Recovery; Peggy Fiedler, San Francisco State University; David Tibor, California Native Plant Society.

Local Support/Coordination: California Department of Fish and Game, U.S. Fish and Wildlife Service, Suisun Resource Conservation District, California Native Plant Society, Solano Farmlands and Open Space Foundation, California Department of Water Resources, U.S. Bureau of Reclamation, Napa-Solano Audubon Society.

EXECUTIVE SUMMARY

REINTRODUCTION OF ENDANGERED SOFT BIRD'S BEAK TO RESTORED HABITAT IN SUISUN MARSH: RESTORATION STRATEGIES FOR RARE PLANT AND TIDAL MARSH COMMUNITY RECOVERY

UC DAVIS WETLAND RESEARCH LABORATORY

PROJECT OVERVIEW: The goal of this study is to provide critical ecological data to facilitate rare plant restoration, as a contribution towards CALFED objectives for improved ecosystem quality through native species recovery and conservation. We propose an experimental reintroduction of endangered soft bird's beak to its historic range within Suisun Marsh. Previous rare plant translocations based on best professional judgment have resulted in failures and less than ideal outcomes due to lack of critical ecological data (Fiedler 1991, Howald 1996). However, experimental restoration with careful demographic analysis can improve restoration success (Pavlik et al. 1993). The recovery of rare plants often requires the creation of new populations in order to decrease extinction risk. This proposal addresses recovery of a rare plant endemic to Suisun and North Bay high tidal marsh. Understanding habitat requirements critical to this species will provide critical information for other sensitive species including California black rail, Suisun thistle, salt marsh harvest mouse, and Suisun shrew. We will design long term monitoring of the new population and facilitate local involvement in the project.

OBJECTIVES AND SUMMARY:

Objective 1: Investigate Habitat Factors Critical To Soft Bird's Beak.

We will complete a detailed habitat characterization throughout the extant range of soft bird's beak. A wide range of biological and physio-chemical factors will be measured within and outside of the narrow tidal elevation supporting the rare plant. Multivariate ordination techniques will be used to select the most important environmental determinants.

Objective 2: Develop Reintroduction Criteria and Screen Reintroduction Sites.

We will develop reintroduction criteria to locate potential sites and specific microhabitats for new populations, and will screen potential reintroduction sites.

Objective 3: Implement Experimental Rare Plant Reintroduction.

We will experimentally reintroduce soft bird's beak to appropriate habitat within its historic range. The proposed reintroduction site is Spring Branch Marsh at Rush Ranch which was restored to tidal action in 1991. This and other sites will be evaluated by rigorous criteria prior to reintroduction. The endangered plant targeted for recovery is an annual hemiroot parasite which relies on host plants for persistence, and colonizes disturbance microgaps within halophytic vegetation. An experimental framework which tracks the demographic fate of marked individuals in reintroduced and natural populations will evaluate the effects of colonization by direct seeding, seedling transplantation with host plants, and habitat manipulations to suppress canopy and reduce competition such as clipping, substrate variation, and manipulation of natural biological suppression by salt marsh dodder holoparasitism.

Objective 4: Local Involvement in Long Term Monitoring and Education Outreach.

A long term monitoring program will be designed for soft bird's beak conservation. Public participation in annual monitoring with oversight by qualified ecologists from UC Davis and Solano Farmlands and Open Space Foundation will be established. Local volunteers from conservation groups will be trained as rare plant monitors. We will develop an interpretive display at Rush Ranch to educate and inform the public of the ecological importance of rare plants, and details of the reintroduction project. We will make presentations regarding this work to local conservation groups. Ultimately, we hope to develop a conceptual model that describes management criteria for the determination of specifically where soft bird's beak populations should be reintroduced within tidal marsh, and to guide decisions as to when physical conditions and high tidal marsh biological communities have sufficiently developed within restored tidal marsh systems to proceed with rare plant reintroductions.

APPLICANT QUALIFICATIONS: Professor Rejmankova, principal investigator, has over 20 years research experience as a wetland plant ecologist, leads the UC Davis Wetland Research Laboratory, supervises wetland ecology graduate students, and is an internationally recognized expert on wetland plant ecology. She has extensive experience in wetlands on four continents. In the San Francisco Estuary, she has conducted tidal marsh restoration monitoring and participated in an EPA funded study on synoptic indicators of salt marsh ecosystem health. Brenda Grewell is a wetland ecologist and doctoral student at UC Davis with 15 years post-graduate professional experience in California wetlands, including 10 years in the Suisun Marsh. Ms. Grewell is a recognized expert on San Francisco Bay and Pacific Coast tidal marsh rare plant and avian species.

BUDGET AND THIRD PARTY IMPACTS: Funds for completion of the project, \$ 148,627, will be spread over two federal fiscal years. The funds provided by CALFED will help leverage the cost-share funding provided by the University of California, Davis which includes but is not limited to the salary of Dr. Rejmankova and wetland laboratory facilities. The involvement of Brenda Grewell as doctoral student investigator in this project provides a significant value to CALFED investment, as she brings senior scientist level experience to the project at an academic level of funding well below comparative professional salary. Results of Ms. Grewell's doctoral research on the functional role of inter-plant parasitism in salt marsh community structure will also enhance and leverage the results of this complementary applied work at no cost to CALFED. No significant third party impacts are identified for this project.

MONITORING AND DATA EVALUATION: Monitoring and data evaluation associated with this project will include: rare plant demographic parameters, plant community composition, plant tissue chemistry, soil chemical and physical parameters, microgap analysis, photon flux density, rare bird and rare plant occurrence, and other habitat correlates. All data and analyses will be reported, and data will be submitted per CALFED specifications.

LOCAL SUPPORT/COORDINATION: Our proposal will provide critical research support to the Suisun Marsh Preservation Agreement partners. The proposal will also provide scientific data to the DFG Plant Conservation Program, U.S. Fish and Wildlife Service Endangered Species Recovery Program, and Solano Farmlands and Open Space Foundation.

PROJECT DESCRIPTION

BACKGROUND: Soft bird's beak (*Cordylanthus mollis* ssp. *mollis*: Scrophulariaceae) is an annual hemiroot parasitic herb of the figwort/snapdragon family. Natural populations of soft bird's beak are known from 10 populations from Suisun and North Bay marshes, and well over 90% of the remaining plants are found within Suisun Marsh (Ruygt 1994). Historic accounts indicate this species is an anthropogenic rarity which has been endangered due to habitat loss and fragmentation (U.S. Fish and Wildlife Service 1995). Early research on the *Hemistegia* subgenus of *Cordylanthus* focused on taxonomy, and verified that these hemiroot parasites rely on a host association for field survival, but are not host specific (Chuang and Heckard 1976, 1973, 1972, 1971). A baseline study of soft bird's beak verified occurrence of historic populations through the San Francisco Estuary, and provided baseline autecological information regarding the species from within two populations at Suisun Marsh and Napa Marsh (Ruygt 1994). Soft bird's beak occurs within a very narrow elevational zone within high tidal marsh. No studies have been conducted to identify the variability of habitat conditions within and outside of the narrow elevation band supporting bird's beak. Our proposed study will provide adaptive management insight to how changing physical processes may effect this rare plant. The parasitic life history strategy of this species precludes simple transplantations. Reintroduction criteria for recovery of the species have not been developed. Experimental reintroductions coupled with critical demographic monitoring have not been conducted.

PROPOSED SCOPE OF WORK: The objective of this study is to provide critical ecological data to facilitate rare plant restoration success in Suisun Marsh and North Bay tidal wetlands.

We propose to group task into four phases: 1) assess habitat characteristics of the endangered soft bird's beak; 2) develop reintroduction criteria for soft bird's beak recovery; 3) implement an experimental reintroduction of the rare plant to appropriate habitat within the Spring Branch Marsh tidal marsh restoration site at Rush Ranch (Suisun Marsh) to determine factors essential to restoration of self-sustaining populations; and 4) establish a long term monitoring program, and provide environmental education outreach services which include an interpretive display and training of conservation volunteers in rare plant monitoring. Research questions and testable hypotheses associated with phase, and a summary of tasks and deliverable products follow. A project schedule is included as Attachment 1.

Phase 1: Investigation of Habitat Factors Critical to Soft Bird's Beak

Research Question: What determines the distribution of soft bird's beak and its special status neighbors within high tidal marsh communities?

Hypothesis. Restriction of soft bird's beak to narrow elevational zones characterized by high species diversity within the intertidal salt marsh is a reflection of biological interactions and physical conditions.

Task 1: Project Management

Task 2: Field collection of soft bird's beak habitat data

Task 3: Lab analysis of soft bird's beak soil and plant samples

Task 4: Multivariate analysis of habitat data by marsh elevational zone

Methods. Randomly dispersed, replicated quadrats in unique vegetation zones along elevational/tidal gradients from upland ecotones to tidal sloughs or bayshores will be measured to describe vegetation pattern and physical conditions within the salt marshes. Species presence, plant cover by species, and canopy height will be measured at maximum summer growth. Fine grain percent cover will be estimated from digital image analysis.

Area and size differentiation of bare soil gaps will be recorded. Soil temperature and ground level photon flux density beneath and at vegetation canopy, and infrared canopy temperature will be measured *in situ*. Soil samples will be collected and analysis may include soil texture, bulk density, water content, organic matter, salinity, Ca:Mg, pH, sodium potential, sodium absorption ratio, chloride, inorganic nitrogen, and total N-P-K. Chemical analysis of rare plant tissue will be evaluated. Distance from tidal source and tidal maxima will be measured, and relative elevation will be recorded. Local climate data will be included. As soft bird's beak co-

occurs with sensitive black rails, visual and audible point count census of birds will be recorded at each monitoring unit by plant zone. Natural history observations of mammals and invertebrates will be recorded. We will use multivariate techniques such as canonical correspondence analysis to detect the key environmental parameters that may have the strongest influences on the distributions of soft bird's beak and sensitive plant and avian species associates. A variety of multivariate and cluster analysis techniques will be examined for application to the resulting data.

Phase 2: Develop Reintroduction Criteria and Screen Reintroduction Sites

Research Question: What logistical, historical, physical, and biological criteria are essential for successful reintroduction and recovery of soft bird's beak?

Hypotheses: Reintroduction sites can be evaluated by comparison with habitat conditions present in relict populations and through examination of historical records. Appropriate reintroduction sites can be screened through application of reintroduction criteria.

Task 1: Project Management

Task 2: Develop reintroduction criteria

Task 3: Collect habitat data within potential reintroduction sites

Task 4: Lab analysis of potential habitat site data

Task 5: Screen potential application sites by reintroduction criteria

Task 6: Select detailed locations for experimental reintroduction

Methods: Reintroduction criteria will be developed from Phase I results, historical records, and logistical investigations. Microsites within appropriate tidal marshes will be screened for appropriate biological community and physical site parameters utilizing plant and soil analyses as described in Phase 1.

Phase 3: Implement Experimental Rare Plant Reintroduction

Research Question: Is reintroduction by seed or transplantation of seedlings with host plants a more successful restoration strategy? What is the demographic status of reintroduced vs. natural populations of soft bird's beak? Can reintroduction coupled with competition suppression or microgap creation enhance the demographic performance of soft bird's beak?

Hypotheses: Demographic performance will not vary between and natural and reintroduced populations. Halophyte competition and gap facilitation will have no significant impact on soft bird's beak.

Task 1: Project Management

Task 2: Collect propagules from local natural populations for reintroduction experiment

Task 3: Establish experimental plots and begin experimental rare plant reintroduction

Task 4: Conduct demographic monitoring in natural population for comparative analysis

Task 5: Conduct demographic monitoring of reintroduced plants and maintain experimental manipulations through growing season (roughly April - November)

Task 6: Collect data on biological and physical conditions of reintroduction habitat

Task 7: Repeat demographic and ecological monitoring second growing season

Task 8: Analyze demographic and experimental treatment data

Task 9: Synthesize experimental reintroduction data and develop management recommendations for restoration success in final written report

Methods: Comparative demographic monitoring of historic populations will be combined with demographic monitoring of restored populations to quantify restoration success. The experimental reintroduction will test the effects of reintroduction by seeding versus transplantation of the rare hemiparasites (soft bird's beak) with selected host plants, the effects of chosen host plant-hemiparasite combinations, and habitat manipulations to create microgaps and suppress competition by clipping, substrate variation, and dodder holoparasitism. A stratified randomized design will be used to assign field treatments and controls and buffer zones will be

established. Individual seedlings within a nearby natural population and the reintroduced population will be marked, and factors that could limit the establishment or growth of the population will be measured. Analysis of variance will be used to evaluate reintroduction treatments.

Phase 4: Local Involvement in Long Term Monitoring and Environmental Education Outreach

Hypotheses: Public awareness of the ecological and aesthetic value of rare plants and biodiversity will contribute to continued public support for the CALFED mission of improved ecosystem quality. Long term monitoring of rare plant reintroductions is essential to their conservation. Conservation volunteers can contribute to citizen monitoring of this project.

Task 1: Project Management

Task 2: Develop an environmental education interpretive display about rare plant conservation and the restoration project at the Rush Ranch interpretive center.

Task 3: Develop long term rare plant monitoring plan, train local conservation volunteers, and assist Rush Ranch staff in long term planning for conservation of the restored population.

Task 4: Present results of restoration project to local conservation groups and CALFED

PROJECT LOCATION: The research and rare plant reintroduction will be conducted in Suisun Marsh, Solano County in Potrero Hills tidal marshes at Hill Slough East, Joice Island, and Rush Ranch tidal marshes shown on Fairfield South and Denverton U.S.G.S. topographic quads (Attachment 2).

Phase 1: In order to more precisely determine the edaphic and biological factors affecting distribution and abundance, we propose to examine and describe the community structure and habitat correlates of historic populations at Hill Slough, Joice/Cutoff Slough, Rush Ranch/2nd Mallard Br., Middle Point or Point Edith, Southampton Marsh, Fagan Marsh, and Point Pinole (Attachment 3). Four of these sites are within Suisun Marsh/Bay, and the remaining three at Benicia, Napa Marsh, and San Pablo Bay provide comparative conditions throughout the modern range. This descriptive work will refine the scope of an experimental reintroduction program designed to illuminate the ecological functions which influence rare plant persistence, and will provide necessary data for reintroduction criteria.

Phase 2: Reintroduction Site Screening: Spring Creek Marsh, and other sites as needed within historic range: Rush Ranch, Suisun Marsh

Phase 3: Experimental reintroduction: Spring Creek Marsh, Rush Ranch - Suisun Marsh (anticipated), natural population comparison - Hill Slough East tidal marsh, Suisun Marsh.

Phase 4: Local Involvement: Rush Ranch Interpretive Center, Solano Farmlands and Open Space Foundation, Suisun Marsh

ECOLOGICAL/BIOLOGICAL BENEFITS

ECOLOGICAL OBJECTIVES: The objective of this study is to provide critical ecological data to facilitate rare plant restoration success in Suisun Marsh and North Bay tidal wetlands. The study will identify reintroduction criteria and techniques for enhanced recovery of the endangered soft bird's beak (*Cordylanthus mollis* ssp. *mollis*) in tidal saline emergent wetland priority habitat. Information derived from this study can be directly applied to CALFED objectives for improved ecosystem quality through native species recovery and conservation through research and implementation of an endangered species reintroduction.

We hypothesize that to successfully reintroduce soft bird's beak to its historic range and create self-sustaining populations in restoration projects, it will be essential to follow careful logistical, historical, biological, and

physical reintroduction criteria. We also predict that detailed demographic monitoring will be essential to assess restoration success. This study will benefit future restoration efforts by quantifying these essential criteria and providing a conceptual model for restoration evaluation.

Primary Benefits: A goal of this project is to re-establish a new self-sustaining population of a native endangered species within its historic range to a site under public protection. The primary benefit is the recovery of soft bird's beak which is a priority special status plant species within saline emergent wetland priority habitat. Understanding the restoration and conservation needs of this species also directly benefits California black rail as this species is found in direct association with soft bird's beak. Implementation of this project will also yield quantitative data to identify ecological processes and functions that should be restored within tidal wetlands.

Secondary Benefits: Phase 1 of this study provides biotic and abiotic data relevant to the recovery of the additional priority species including Suisun thistle, Mason's lilaepsis, clapper rail, and salt marsh harvest mouse as they occur within marsh intertidal zones near soft bird's beak. A multivariate analysis of biological and physical factors correlated with these species will be a product of this research. These data may also contribute to an expanded understanding of estuarine wetland - aquatic food web linkages. The infrastructure is in place to ensure the long term protection of the new rare plant population, and Solano Farmlands and Open Space Foundation (SFOSF, the public trust property manager) enthusiastically supports this project. Long term conservation of these rare plants is compatible with their mission, and results will assist them with future restoration goals.

Third Party Benefits: Rush Ranch (SFOSF) maintains an active docent and environmental education program. Experimental reintroduction of this endangered plant on their land has high public education value, and will provide opportunities for a broader understanding of conservation biology and public support for the CALFED mission. This project is leveraged by the public service mission and education outreach experience of the University of California, and we will actively work with SFOSF staff to develop an environmental education display, program, and citizen monitoring compatible with conservation of a sustainable population.

Other Ecosystem Restoration Program Benefits: The priority native species recovery and enhanced understanding of ecological process and function important to both soft bird's beak and black rail will also benefit restoration programs and agencies including the Suisun Marsh Preservation Agreement, U.S. Fish and Wildlife Service Tidal Wetlands Species Recovery Plan, San Francisco Bay Ecosystem Goals Project, Montezuma Wetlands Project, San Francisco Bay National Estuarine Research Reserve, Benicia State Recreation Area, Point Pinole Regional Shoreline, Department of Fish and Game, and the Bay Conservation and Development Commission.

Linkage to Current and Future Projects: Habitat restoration projects in the Suisun - North Bay region in the planning and implementation stages have proposed rare plant recovery, but to date essential research to support future restoration of sensitive plant species has not been conducted. This project will provide critical research support to ensure successful and timely completion of the existing CALFED-funded DFG Hill Slough West Habitat Demonstration Project (May 1998) which proposes to restore tidal action to 200 acres in Suisun Marsh and introduce rare plants. To date scientific research to support such reintroductions has not been conducted, and timely completion of this project would be facilitated by this proposal. Critical research on rare plant demographic dynamics and habitat needs must be conducted before this demonstration project can move beyond planning to an implementation phase.

The restoration success of the proposed Montezuma Wetlands Project and tidal marsh restoration regulatory mandates/mitigation requirements of the parties to the Suisun Marsh Preservation Agreement (DFG, DWR, USBR, SRCD) will benefit from this project. The project will benefit the restoration objectives of the Solano Farmlands and Open Space Foundation.

Linkage to ERP Actions and Goals:

This project will achieve recovery of at-risk native species dependent on the Suisun Bay ecosystem as a first step toward establishing large self-sustaining populations of an endangered plant species. The proposal directly addressed focused actions relative to habitat restoration of marshes (RFP, p. 18), and the study will improve our understanding of hydrologic, geomorphic and ecological relationships. Restoration of an endangered plant population has direct links to other listed species including black rail. It is well established that emergent marsh vegetation also provides dissolved organic carbon and nutrients which support aquatic foodwebs, and therefore restoration of this rare plant community has food web linkages to delta smelt and splittail which are found in the Spring Branch tidal system within Suisun Marsh.

Information derived from this study can be directly applied to CALFED goals for improved ecosystem quality: native species recovery and conservation of an endangered species by experimental reintroduction (Goal 1, p. 1, ERP V.II); quantification of abiotic and biotic parameters across intertidal zones supporting endangered species which will assist with understanding natural processes and functions should be rehabilitated and will facilitate informed adaptive management (Goal 2, p.1, ERP V.II); and protection and restoration of functional saline emergent wetland and maintenance of floristic diversity and natural tidal marsh mosaic landscapes will provide aesthetic values and scientific research (Goal 4, p.1, ERP V.II).

Linkage to EP Strategic Objective and Targets:

Evaluation of reintroduction criteria and strategies for soft bird's beak supports the strategic objective to restore at risk endemic tidal brackish marsh plants (p. 274, ERP V.II). The reintroduction of an endangered species into a restored tidal marsh also supports the strategic objective for tidal saline emergent wetland habitat (p. 133, ERP V.II). This project directly supports the strategic objective for recovery of California black rail, as this species directly co-occurs with soft bird's beak (p. 249, ERP V. II). The project also supports the strategic objective for recovery of Suisun song sparrow as we have observed this species foraging in soft bird's beak populations (p. 255, ERP V.II). The recovery of salt marsh harvest mouse may be enhanced (p. 261, ERP V.II). This research proposal includes site based evaluations and develops methods to protect, restore, and manage habitat and populations of special status plants in line with CALFED identified actions (p. 274, ERP V.II). This project will also help identify important links to the Bay-Delta aquatic foodweb (p.155, ERP V.II).

System-Wide Ecosystem Benefits:

Establishment of a restored population of soft bird's beak will provide an additional propagule source for tidal dispersal to safe sites within the tidal marsh system, contributing to enhanced biodiversity of tidal wetlands. The proposal complements ongoing restoration planning and implementation efforts in the Suisun Marsh and North Bay by Department of Fish and Game, Suisun Marsh Preservation Agreement partners, IEP Suisun Ecological Workgroup, U.S. Fish and Wildlife Service tidal wetland species recovery goals, and private restoration efforts such as Montezuma Wetlands.

Compatibility with Non-Ecosystem Objectives: There are no perceived conflicts associated with this project relative to other CALFED goals and objectives.

TECHNICAL FEASIBILITY AND TIMING

There are no CEQA and NEPA environmental compliance documents needed for this research project.

An Endangered Plant Research Permit and Rare Plant Collection Permit will be required from the Department of Fish and Game as soft bird's beak is a state-listed rare plant. The Hill Slough East research site (natural population for comparative demography) was selected for conservation reasons. We believe this is the best location for this research as the local population is self-sustaining, > 90% of the Estuary-wide population of the rare plant occurs there, and research would only impact a very small fraction (< 2%) of the population. This plant is also listed as endangered under the federal ESA, but federal permits for listed rare plant research are not

needed as the research will not be conducted on federal property. Informal consultation with the USFWS Endangered Species Office has been initiated, and federal research permits will be obtained if needed as the rare plant habitat may overlap with habitat of endangered salt marsh harvest mouse. Sites were selected that have had no historic detections of California clapper rails, though clapper rails are present at other locations within the Hill Slough and Rush Ranch tidal marshes. Research site selection and methods were carefully considered to avoid impacts to special status species.

The project biologist (Grewell) has held past rare plant collection permits and will renew this permit for the project year. The project biologist has also been permitted to conduct clapper rails surveys in the past. If needed, she will do any work relative to this project under a current federal take permit issued to her by USFWS. The project biologist discovered the Hill Slough East population of soft bird's beak, and has ten years experience with this species and other rare estuarine plants. The project biologist also has ten years experience conducting clapper rail census, and has worked with sensitive black rails and other special status birds (common loon and osprey) for over 20 years. Informal consultation with DFG and USFWS endangered species staff has already been conducted relative to this proposal regarding the need for endangered plant research permits, and these permits will be issued if the project is approved. This research will directly support the recovery efforts of Department of Fish and Game and U.S. Fish and Wildlife endangered species programs.

Our laboratory is currently engaged in salt marsh plant community research in the San Francisco Estuary and central Pacific Coast. We are specifically researching the functional role of parasitic plants in salt marsh community structure. This proposed restoration project is an applied study which will be complemented by our previous work. We have complete analytical facilities in house, are familiar with the species and habitats, have a strong working relationship with the regulatory agencies and Agency endangered species biologists. We are able to begin this research immediately upon receipt of funding. Delay of the project by a year or more would preclude Brenda Grewell's participation in the project, as she is on schedule to complete her final research requirements for the Ph.D. degree. In the event of a significant delay in funding, a new wetland ecology graduate student would be assigned to the project.

MONITORING AND DATA COLLECTION METHODOLOGY

Anticipated monitoring parameters and data collection approach to address the hypotheses associated with our four objectives are summarized in Table 1. If funded, actual monitoring needs and approach will be refined to address final experimental design. Power analysis of preliminary data may also be evaluated to determine the best number of replicate samples needed. This preliminary table is our best estimate of the variables to be included prior to onsite planning and design. Field collection of data and laboratory analyses will follow standard methods with rigorous attention to data quality assurance and control. Experimental design and data collection will be implemented to allow for appropriate statistical analyses of data. A variety of analysis of variance, regression, and multivariate unimodal models to relate species to environmental factors will be used to evaluate results of this work. Our lab is well versed in experimental design, field and laboratory analyses methods, and statistics.

BIOLOGICAL/ECOLOGICAL OBJECTIVES AND HYPOTHESES:

The monitoring parameters listed in Attachment key to the following project objects and hypotheses:

Objective 1: Investigation of Habitat Factors Critical to Soft Bird's Beak

Research Question: What determines the distribution of soft bird's beak and its special status neighbors within high tidal marsh communities?

Hypothesis. Restriction of soft bird's beak to narrow elevational zones characterized by high species diversity within the intertidal salt marsh is a reflection of biological interactions and physical conditions.

Objective 2: Develop Reintroduction Criteria and Screen Reintroduction Sites

Research Question: What logistical, historical, physical, and biological criteria are essential for successful reintroduction and recovery of soft bird's beak?

Hypotheses: Reintroduction sites can be evaluated by comparison with habitat conditions present in relic populations and through examination of historical records. Appropriate reintroduction sites can be screened through application of reintroduction criteria.

Objective 3: Implement Experimental Rare Plant Reintroduction

Research Question: Is reintroduction by seed or transplantation of seedlings with host plants a more successful restoration strategy? What is the demographic status of reintroduced vs. natural populations of soft bird's beak?

Can reintroduction coupled with competition suppression or microgap creation enhance the demographic performance of soft bird's beak?

Hypotheses: Demographic performance will not vary between and natural and reintroduced populations. Halophyte competition and gap facilitation will have no significant impact on soft bird's beak

Objective 4: Local Involvement in Long Term Monitoring and Education Outreach

Hypotheses: Public awareness of the ecological and aesthetic value of rare plants and biodiversity will contribute to continued public support for the CALFED mission of improved ecosystem quality. Long term monitoring of rare plant reintroductions is essential to their conservation. Conservation volunteers can contribute to citizen monitoring of this project.

LOCAL INVOLVEMENT

The Solano County Board of Supervisors and Planning Department, Napa County Board of Supervisors, and Contra Costa County Board of Supervisors, and the Bay Conservation and Development Commission have been notified in writing of the project proposal (Attachment 4).

The Solano Farmlands and Open Space Foundation (SFOSF), California Native Plant Society, and Napa-Solano Audubon Society are aware of the proposed project and are supportive. Rare plant reintroduction on SFOSF land is enthusiastically supported as this research will help SFOSF with future restoration planning and tidal marsh habitat enhancement (Attachment 5).

Research will be coordinated with the Department of Fish and Game and the Solano Farmlands and Open Space Foundation, and conducted on public lands under their management. This project complements the mission and management objectives of both agencies for management of their sensitive tidal marsh habitat. There are no affected private landowners.

The Suisun Resource Conservation District, Department of Water Resources, Bureau of Reclamation, and Department of Fish and Game are all parties to the Suisun Preservation Agreement. Current and future mitigation requirements of these agencies will benefit from the research results of this project.

COST

Budget : Total cost for this project is \$ 148,627 allocated over two federal fiscal years. The total project budget and quarterly budgets are included as Tables 2 and 3.

The schedule for the four concurrent phases of the project include the following milestones:

Phase 1: Start October 1, 1999. Complete June 30, 2000.

Phase 2: Start October 1, 1999. Complete June 30, 2000.

Phase 3: Start October 1, 1999. Complete September 30, 2001.

Phase 4: Start April 1, 2000. Complete September 30, 2001.

Phases 1 – 3 are inseparable. Phase 4 is not essential to phases 1 – 3, but includes a mechanism for long term monitoring of the newly established population and essential local involvement.

COST-SHARING

This project is leveraged by the direct donation of the salary and benefits of the principal investigator, Professor Eliska Rejmankova at a value of \$ 32,480 which represents 20% of her time. In addition, the facilities of the Wetland Research Laboratory provide a significant contribution to this contract. Our lab has most of the equipment and computer facilities necessary to conduct the proposed research. This includes, e.g., the drying oven for plant and soil samples, the muffle furnace, CHN analyzer, spectrophotometer, ion selective electrodes, pH meters and conductivity meters, and a growth chamber. In addition, we have an access to the atomic absorption analyzer and ICP analyzer on which most of the cation and anion will be analyzed at nominal cost.

APPLICANT QUALIFICATIONS

Professor Rejmankova, principal investigator, has over 20 years research experience as a wetland plant ecologist, leads the UC Davis Wetland Research Group, supervises 6 wetland ecology graduate students, and is an internationally recognized expert on wetland plant ecology. In the San Francisco Estuary, she has conducted freshwater tidal restoration monitoring and brackish/salt marsh research. She has completed a tidal wetland restoration monitoring program for the ACOE in the Sacramento - San Joaquin Delta. She has also collaborated with Dr. S. Ustin and Dr. E. Sanderson on an EPA funded study of synoptic indicators of marsh ecosystem health in the Petaluma Marsh. Dr. Rejmankova will be the project manager, provide scientific guidance, and will be involved in data collection, interpretation, and report preparation.

Brenda Grewell, project research collaborator, is a wetland ecologist and doctoral candidate at UC Davis with 15 years post-graduate professional experience in California wetlands, including 10 years in the Suisun Marsh. Ms. Grewell is a recognized expert on San Francisco Bay and central Pacific Coast tidal marsh rare plant and avian species. The focus of her dissertation work is the functional role of parasitic interaction webs in high tidal marsh community structure and rare plant persistence. This proposal complements Ms. Grewell's academic research in central Pacific Coast salt marshes, and her academic research in coastal wetlands from Coos Bay, Oregon to San Francisco Bay will provide comparative data for a more complete understanding of this applied research in the Suisun Marsh. Ms. Grewell will obtain necessary endangered species research permits, will lead the implementation of the field studies, will collect and analyze data, and be involved in report preparation.

Jian Huang has over ten years experience as a lab technician, with analyses of plant soil and water samples. She is proficient in basic standard analysis methods, material handling, and laboratory safety. Ms. Huang is also proficient at technically demanding analyses including full CHN and atomic absorption techniques. Ms. Huang will provide laboratory analytical services for soil and water chemical and physical parameters, and plant tissue chemical analysis. Ms. Huang will also program, calibrate, and maintain continuous monitoring devices for temperature, light intensity, and water level in the field and will be responsible for data retrieval, storage, and display from such devices throughout the course of the field studies.

UC Davis undergraduate laboratory assistants will assist with field data collection and data entry. Wetland Research Laboratory graduate research assistants, UC Davis and San Francisco State University professors, and Agency plant ecologists will provide technical peer review.

COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

Standard forms for projects funded by the Federal government and State agencies are attached.

No specific deviations from contractual terms and conditions are required for implementation of this proposal.

The University is not aware of any potential conflicts of interest. Professor Rejmankova and the University of California are the Contractors, and they are in complete compliance with standard terms and conditions. Brenda Grewell, a graduate student proposed to collaborate on this project was a previous employee of the Department of Water Resources. We have been advised she does not have conflict of interest restrictions for this RFP as this CALFED funding cycle is more than a year since she resigned from State Service to pursue full time graduate studies. This study would benefit from Ms. Grewell's participation as a post-graduate researcher.

Table 1. Monitoring and Data Collection Information

Hypothesis*	Monitoring Parameter	Sampling		Data		
		Frequency	Equipment	Evaluation	Personnel	Locations
Phase 1	Plant Species Presence	1X/replicates	Waterproof Field Book	Field I.D	PGR,LA	H,R,J,P,E,B,N,P
	Plant % Cover	1X/replicates	Quadrat Frame	Quadrat Sampling	PGR,LA	H,R,J,P,E,B,N,P
	Plant % Cover	1X/replicates	Camera,UCD IAL	Image Analysis	PGR,LA	H,R,J,P,E,B,N,P
	Canopy Height	1X/replicates	Metric Pole	Direct Measure	PGR,LA	H,R,J,P,E,B,N,P
	Soil Chemistry	1X/replicates	Refract, Spec. Conduct.Meter,	Field Direct Measure	LT,PGR	H,R,J,P,E,B,N,P
	Soil Chemistry	1X/replicates	Atomic Absor., CHN,ash	and Lab Analysis	LT	H,R,J,P,E,B,N,P
	Soil Chemistry	1X/replicates	ORP Meter, pH Meter	Direct Measure	LT,PGR	H,R,J,P,E,B,N,P
	Soil Texture	1X/replicates	Grain Size Analysis	Lab Analysis	LT	H,R,J,P,E,B,N,P
	Soil Water Content	1X/replicates	Soil Drying Oven, Balance	Gravimetric/Balance	LT,LA	H,R,J,P,E,B,N,P
	Soil Temperature	1X/replicates	Soil Thermometer	Direct Measure	PGR,LA	H,R,J,P,E,B,N,P
	Plant Tissue Analysis	1X/replicates	Color Chart, AA,CHN	Lab Analysis	LT	H,R,J,P,E,B,N,P
	Microgap Analysis	1X/replicates	Camera, UCD IAL	Image Analysis	PGR,LA	H,R,J,P,E,B,N,P
	Canopy Temperature	1X/replicates	Infrared Thermometer	Direct Measure	PGR,LA	H,R,J,P,E,B,N,P
	Photon Flux Density	1X/replicates	LICOR Meter	Direct Measure	PGR,LA	H,R,J,P,E,B,N,P
Phase 2	Plant Species Presence	1X/replicates	Waterproof Field Book	Field I.D	PGR,LA	SPBR,RUSH
	Plant % Cover	1X/replicates	Quadrat Frame	Quadrat Sampling	PGR,LA	SPBR,RUSH
	Plant % Cover	1X/replicates	Camera,UCD IAL	Image Analysis	PGR,LA	SPBR,RUSH
	Canopy Height	1X/replicates	Metric Pole	Direct Measure	PGR,LA	SPBR,RUSH
	Soil Chemistry	1X/replicates	Refract, Spec. Conduct.Meter,	Field Direct Measure	LT,PGR	SPBR,RUSH
	Soil Chemistry	1X/replicates	Atomic Absorption, CHN,	and Lab Analysis	LT	SPBR,RUSH
	Soil Chemistry	1X/replicates	ORP Meter, pH Meter	Direct Measure	LT,PGR	SPBR,RUSH
	Soil Texture	1X/replicates	Grain Size Analysis	Lab Analysis	LT	SPBR,RUSH
	Soil Water Content	1X/replicates	Soil Drying Oven, Balance	Gravimetric/Balance	LT,LA	SPBR,RUSH
	Soil Temperature	1X/replicates	Soil Thermometer	Direct Measure	PGR,LA	SPBR,RUSH
	Plant Tissue Analysis	1X/replicates	Color Chart, AA,CHN	Lab Analysis	LT	SPBR,RUSH
	Microgap Analysis	1X/replicates	Camera, UCD IAL	Image Analysis	PGR,LA	SPBR,RUSH
	Canopy Temperature	1X/replicates	Infrared Thermometer	Direct Measure	PGR,LA	SPBR,RUSH
	Photon Flux Density	1X/replicates	LICOR Meter	Direct Measure	PGR,LA	SPBR,RUSH
Phase 3	Plant Demography - Growth	72x/replicates	Metric Scales, Calipers	Direct Measure	PGR,LA	HILL,SPBR
	Plant Demography - Survival	1X/replicates	Direct Observation	Direct Measure	PGR,LA	HILL,SPBR
	Plant Demography - Reprod.	1X/replicates	Metric Scales, Balance	Direct Measure	PGR,LA	HILL,SPBR
	Soil Chemistry	18X/replicates	same as Hypothesis 1	same as Hyp 1	LT	HILL,SPBR
	Air Temperature	Continuous	Temperature Logger	Rep Measures ANOVA	LT	HILL,SPBR
	Light Intensity	Continuous	Light Intensity Logger	Rep Measures ANOVA	LT	HILL,SPBR
	Wetland Hydroperiod	Continuous	Global Water Level Logger	Rep Measures ANOVA	LT	HILL,SPBR
Phase 4	Species Cover	1X/annual	Long Term Census Grid	Direct Measure	PGR,LA	SPBR
	Species Abundance	1X/annual	Long Term Census Grid	Direct Measure	PGR,LA	SPBR

* See Text of Proposal for Complete Statement of Hypothesis

TABLE 2 Total budget

Task	Direct Labor	Direct Salary & Benefits	Supplies	Equipment	Travel (miles)	Overhead/Indirect	Total	Breakdown of Fee		
								Salary	Benefits	Remission
1.1 Project Mgmt										
1.2 Field Data Coll.	P: 9m 25%;	\$9,035.00	\$1,300.00	\$3,100.00	\$662.00	\$856.00	\$15,053.00	\$6,491.00	\$1,104.00	\$1,440.00
1.2 Field Data Coll.	LA 390h	\$4,740.00				\$474.00	\$5,214.00	\$4,680.00	\$60.00	
1.3 Lab Analysis	LT: 9m; 25%	\$4,779.00	\$2,600.00			\$738.00	\$8,117.00	\$4,719.00	\$60.00	
1.4 Data Evaluation	P: 9m 25%;	\$9,035.00				\$760.00	\$9,795.00	\$6,491.00	\$1,104.00	\$1,440.00
2.1 Project Mgmt						\$0.00	\$0.00			
2.2 Field data	P: 9m 25%;	\$9,035.00	\$2,000.00	\$1,810.00	\$441.00	\$1,004.00	\$14,290.00	\$6,491.00	\$1,104.00	\$1,440.00
2.2 Field data	LA 390h	\$4,740.00				\$718.00	\$5,458.00	\$4,680.00	\$60.00	
2.3 Lab Analysis	LT: 9m; 25%	\$4,779.00	\$1,600.00			\$638.00	\$7,017.00	\$4,719.00	\$60.00	
2.4 Data Evaluation	P: 3m 25%	\$3,849.00				\$241.00	\$4,090.00	\$3,428.00	\$583.00	\$1,440.00
3.1 Project Mgmt						\$0.00	\$0.00			
3.2 Field Work	P: 20m; 25%	\$19,666.00	\$145.00		\$6,300.00	\$2,467.00	\$28,578.00	\$14,425.00	\$3,801.00	\$1,440.00
3.2 Field Work	LA 530h	\$6,435.00				\$1,323.00	\$7,758.00	\$6,360.00	\$75.00	
3.3 Lab analysis	LT: 15 m; 50%	\$18,404.00				\$1,840.00	\$20,244.00	\$15,730.00	\$2,674.00	
3.4 Data Analysis and Synt.							\$0.00			
4.1 Project Mgmt							\$0.00			
4.2 Interpretive Display	P: 3 m 25%	\$3,972.00	\$1,000.00			\$341.00	\$5,313.00	\$2,164.00	\$368.00	\$1,440.00
4.3 Long term mon. plan	P: 5m 25%;	\$4,219.00			\$315.00	\$453.00	\$4,342.00	\$3,806.00	\$613.00	
4.3 Long term mon. plan	LA 490h	\$6,880.00				\$688.00	\$7,568.00	\$5,880.00	\$1,000.00	
4.4 Oral Presentations	P: 6m 25%	\$5,084.00	\$200.00			\$526.00	\$5,790.00	\$4,328.00	\$736.00	
		\$114,832.00	\$8,845.00	\$4,910.00	\$7,718.00	\$13,167.00	\$148,627.00	\$94,192.00	\$13,402.00	\$8,640.00

P = PGR V., LT = Lab technician, LA = undergraduate lab assistant

Total Direct Costs **\$135,460.00**
 Overhead **\$13,167.00**
 Total amount requested **\$ 148,627.00**

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I-014457

Table 3 Quarterly budget - direct cost

TASK	Expense:									FEE			
		Q1 Oct-Dec	Q2 Jan-Mar	Q3 Apr-Jun	Q4 Jul-Sep	Q5 Oct-Dec	Q6 Jan-Mar	Q7 Apr-Jun	Q8 Jul-Sep	Direct cost	SALARY	BENEFITS	REMISSION
1	PGR	\$3,128.00	\$3,128.00	\$3,129.00						\$9,385.00	\$4,329.00	\$736.00	\$4,320.00
	LT	\$1,594.00	\$1,594.00	\$1,594.00						\$4,782.00	\$4,722.00	\$60.00	
	LA	\$1,580.00	\$1,580.00	\$1,580.00						\$4,740.00	\$4,680.00	\$60.00	
	Supplies	\$1,300.00	\$1,300.00	\$1,300.00						\$3,900.00			
	Equipment	\$3,100.00								\$3,700.00			
	Travel miles	\$221.00	\$221.00	\$221.00						\$663.00			
	Totals	\$10,923.00	\$10,923.00	\$10,928.00						\$33,470.00	\$18,711.00	\$1,456.00	\$17,300.00
2	PGR	\$3,128.00	\$3,128.00	\$3,129.00						\$9,385.00	\$4,329.00	\$736.00	\$4,320.00
	LT	\$1,594.00	\$1,594.00	\$1,594.00						\$4,782.00	\$4,722.00	\$60.00	
	LA	\$1,580.00	\$1,580.00	\$1,580.00						\$4,740.00	\$4,680.00	\$60.00	
	Supplies	\$2,000.00	\$800.00	\$800.00						\$3,600.00			
	Equipment	\$1,810.00								\$1,810.00			
	Travel	\$0.00	\$221.00	\$221.00						\$442.00			
	Totals	\$9,032.00	\$5,549.00	\$5,554.00						\$29,069.00	\$14,371.00	\$1,512.00	\$14,244.00
3	PGR	\$1,688.00	\$1,688.00	\$1,688.00	\$10,126.00	\$6,503.00	\$6,503.00	\$3,972.00	\$3,375.00	\$35,543.00	\$26,687.00	\$4,536.00	\$4,320.00
	LT				\$3,682.00	\$3,682.00	\$3,682.00	\$1,580.00	\$1,580.00	\$14,208.00	\$12,561.00	\$1,645.00	
	LA				\$2,808.00	\$2,808.00	\$1,825.00			\$7,441.00	\$6,360.00	\$1,081.00	
	Supplies				\$745.00	\$600.00	\$600.00			\$1,945.00			
	Equipment												
	Travel				\$1,260.00	\$1,260.00	\$1,260.00	\$945.00	\$945.00	\$5,670.00			
	Totals	\$1,688.00	\$1,688.00	\$1,688.00	\$14,676.00	\$11,753.00	\$11,753.00	\$6,357.00	\$5,900.00	\$64,437.00	\$56,208.00	\$7,262.00	\$4,320.00
4	PGR							\$2,532.00	\$6,751.00	\$9,283.00	\$7,934.00	\$1,349.00	
	LT							-\$1,593.50	\$1,593.50	\$3,187.00	\$3,147.00	\$40.00	
	LA							\$2,808.00	\$2,808.00	\$5,616.00	\$4,800.00	\$816.00	
	Supplies							\$1,000.00	\$200.00	\$1,200.00			
	Equipment									\$0.00			
	Travel							\$315.00	\$315.00	\$630.00			
	Totals							\$315.00	\$7,877.50	\$19,716.00	\$16,881.00	\$2,205.00	
Totals		\$22,723.00	\$16,834.00	\$16,836.00	\$18,621.00	\$14,853.00	\$13,870.00	\$14,745.50	\$17,567.50	\$135,460.00	\$88,951.00	\$11,179.00	\$12,960.00

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I-014458

ATTACHMENT 1. PROJECT SCHEDULE

TASK	QTR 1 OCT-DEC 99	QTR 2 JAN-MAR 00	QTR 3 APR-JUN 00	QTR 4 JUL-SEP 00	QTR 5 OCT-DEC 00	QTR 6 JAN-MAR 01	QTR 7 APR-JUN 01	QTR 8 JUL-SEP 01
Phase I: Habitat Assess.								
I.1. Project Mgmt								
I.2. Field Data Coll.								
I.3. Lab Analysis								
I.4. Stats Analysis/Results								
Phase II: Reintro Crit/Screen								
II.1. Project Mgmt								
II.2 Dev, Reintro. Criteria								
II.3. Field data/pot. Sites								
II.4. Lab Analysis Pot. Sites								
II.5. Screen Sites								
Phase III: Rare Plant Reintro.								
III.1. Project Mgmt								
III.2. Propagule collection								
III.3.a. Exp. Plots. Seed								
III.3.b. Exp. Plots. Transplant								
III.4. Demography - Nat. Pop								
III.5. Demography - Reint pop								
III.6. Rest. Habitat Data								
III.7. Lab Analysis Hab. Data								
III.8. Analyze Exp. Data								
III.9. Synthesis: Final Report								
Phase IV: Local Involv/Ed.								
IV.1. Project Mgmt								
IV.2. Interpretive Display								
IV.3. Long Term Mon. Plan								
IV.4. Oral Presentations								

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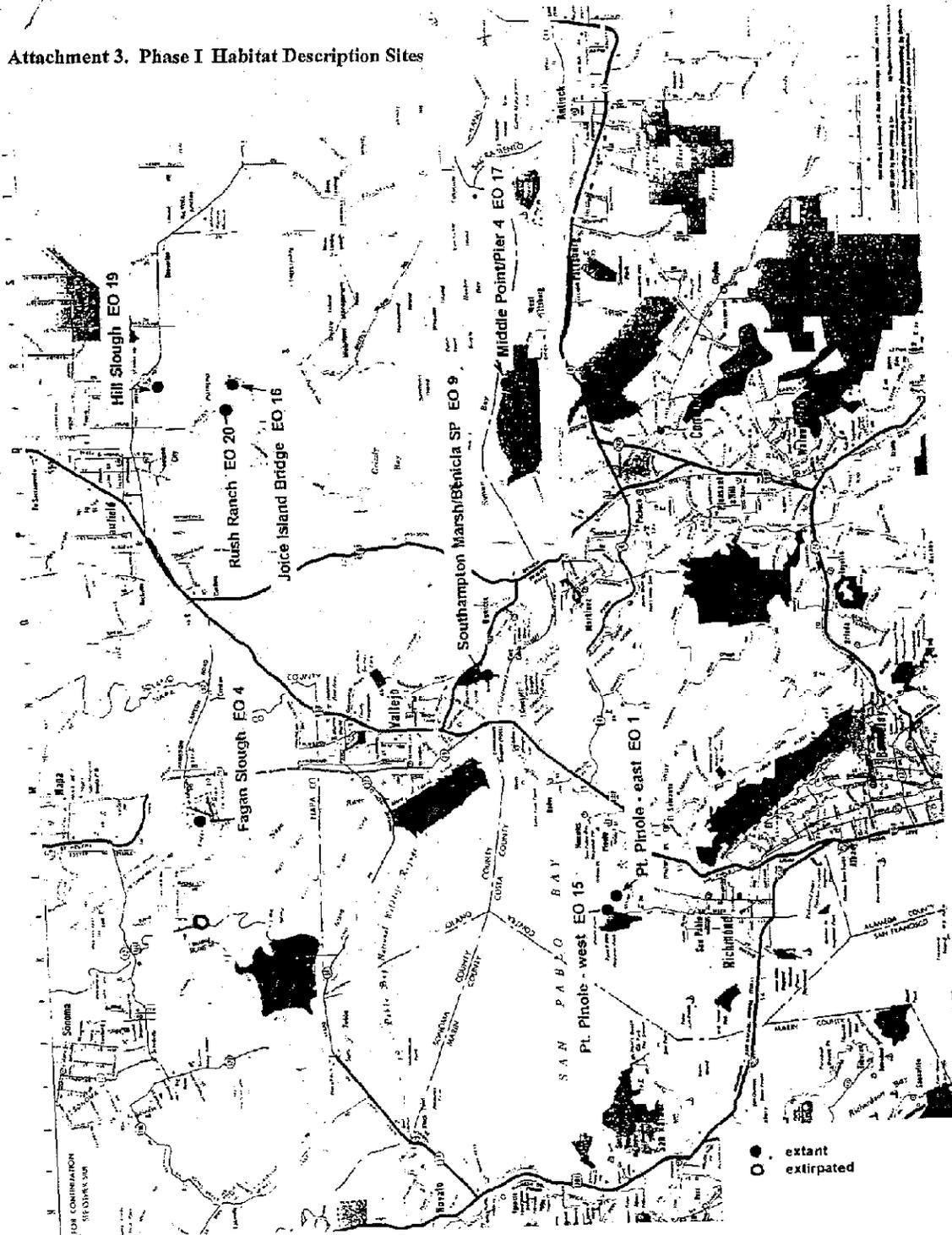
I-014459



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I-014460

Attachment 3. Phase I Habitat Description Sites



Studies of *Cordylanthus mollis* ssp. *mollis*

UNIVERSITY OF CALIFORNIA, DAVIS

BERKELEY • DAVIS • IRVINE • LOS ANGELES • RIVERSIDE • SAN DIEGO • SAN FRANCISCO



SANTA BARBARA • SANTA CRUZ

DEPARTMENT OF ENVIRONMENTAL SCIENCE AND POLICY

ONE SHIELDS AVENUE
DAVIS, CALIFORNIA 95616 8576

Bay Conservation and Development Commission
30 Van Ness Avenue, Room 2011
San Francisco, California 94102

April 13, 1999

Dear Bay Conservation and Development Commission:

I am writing to inform you of my intent to submit a proposal to the CALFED Bay-Delta Ecosystem Restoration Program. My proposed research is "Reintroduction of Endangered Soft Bird's Beak to Restored Habitat in Suisun Marsh: Restoration Strategies for Rare Plant and Tidal Marsh Community Recovery". The primary location for the proposed research is Solano County Farmlands and Open Space Foundation's Rush Ranch site in Suisun Marsh, and the Foundation is supportive of this research. We will collect comparative data for one phase of our study at the Department of Fish and Game's Hill Slough Wildlife Area, the Joice Island Unit of the Grizzly Island Wildlife Area, and Southampton Marsh - Benicia State Recreation Area in Solano County; Fagan Marsh, in Napa County; and at Point Pinole and Middle Point or Point Edith in Contra Costa County. In the event this research proposal is selected for funding, we would be pleased to provide you a copy of our final report.

Sincerely,

A handwritten signature in cursive script that reads "Eliska Rejmankova".

Eliska Rejmankova
Associate Professor



DEPARTMENT OF ENVIRONMENTAL SCIENCE AND POLICY

ONE SHIELDS AVENUE
DAVIS, CALIFORNIA 95616-8576

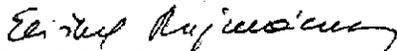
Solano County Board Of Supervisors
580 Texas Street
Fairfield, California 94533

April 13, 1999

Dear Solano County Board of Supervisors:

I am writing to inform you of my intent to submit a proposal to the CALFED Bay-Delta Ecosystem Restoration Program. My proposed research is "Reintroduction of Endangered Soft Bird's Beak to Restored Habitat in Suisun Marsh: Restoration Strategies for Rare Plant and Tidal Marsh Community Recovery". The primary location for the proposed research is Solano County Farmlands and Open Space Foundation's Rush Ranch site in Suisun Marsh, and the Foundation is supportive of this research. We will collect comparative data for one phase of our study at the Department of Fish and Game's Hill Slough Wildlife Area, the Joice Island Unit of the Grizzly Island Wildlife Area, and Southampton Marsh at the Benicia State Recreation Area in Solano County. In the event this research proposal is selected for funding, we would be pleased to provide you a copy of our final report.

Sincerely,


Eliska Rejmankova
Associate Professor



DEPARTMENT OF ENVIRONMENTAL SCIENCE AND POLICY

ONE SHIELDS AVENUE
DAVIS, CALIFORNIA 95616-8576

Solano County Environmental Management
Planning Department
580 Texas Street
Fairfield, California 94533

April 13, 1999

Dear Solano County Planning Department:

I am writing to inform you of my intent to submit a proposal to the CALFED Bay-Delta Ecosystem Restoration Program. My proposed research is "Reintroduction of Endangered Soft Bird's Beak to Restored Habitat in Suisun Marsh: Restoration Strategies for Rare Plant and Tidal Marsh Community Recovery". The primary location for the proposed research is Solano County Farmlands and Open Space Foundation's Rush Ranch site in Suisun Marsh, and the Foundation is supportive of this research. We will collect comparative data for one phase of our study at the Department of Fish and Game's Hill Slough Wildlife Area, the Joice Island Unit of the Grizzly Island Wildlife Area, and Southampton Marsh at the Benicia State Recreation Area in Solano County. In the event this research proposal is selected for funding, we would be pleased to provide you a copy of our final report.

Sincerely,

A handwritten signature in cursive script, appearing to read "Eliska Rejmankova".

Eliska Rejmankova
Associate Professor



DEPARTMENT OF ENVIRONMENTAL SCIENCE AND POLICY

ONE SHIELDS AVENUE
DAVIS, CALIFORNIA 95616-8576

Napa County Board of Supervisors
Napa County Planning Department
1195 Third Street, Rooms 210
Napa, California 94559

April 13, 1999

Dear Napa County Board of Supervisors and Planning Department:

I am writing to inform you of my intent to submit a proposal to the CALFED Bay-Delta Ecosystem Restoration Program. My proposed research is "Reintroduction of Endangered Soft Bird's Beak to Restored Habitat in Suisun Marsh: Restoration Strategies for Rare Plant and Tidal Marsh Community Recovery". The primary location for the proposed research is Solano County Farmlands and Open Space Foundation's Rush Ranch site in Suisun Marsh, and the Foundation is supportive of this research. We will collect comparative data for one phase of our study at the Fagan Slough Ecological Reserve Marsh in Napa County. In the event this research proposal is selected for funding, we would be pleased to provide you a copy of our final report.

Sincerely,

A handwritten signature in cursive script, appearing to read "Eliska Rejmankova".

Eliska Rejmankova
Associate Professor



DEPARTMENT OF ENVIRONMENTAL SCIENCE AND POLICY

ONE SHIELDS AVENUE
DAVIS, CALIFORNIA 95616-8576

Contra Costa County Board of Supervisors
Contra Costa County Planning Department
651 Pine Street, Room 106
Martinez, CA 94553

Eliska Rejmankova
Department of Environmental Science and Policy
University of California, Davis
One Shields Avenue
Davis, California 95616

April 13, 1999

Dear Contra Costa County Board of Supervisors:

I am writing to inform you of my intent to submit a proposal to the CALFED Bay-Delta Ecosystem Restoration Program. My proposed research is "Reintroduction of Endangered Soft Bird's Beak to Restored Habitat in Suisun Marsh: Restoration Strategies for Rare Plant and Tidal Marsh Community Recovery". The primary location for the proposed research is Solano County Farmlands and Open Space Foundation's Rush Ranch site in Suisun Marsh, and the Foundation is supportive of this research. We will collect comparative data for one phase of our study at the Point Edith Ecological Reserve Marsh in Contra Costa County. In the event this research proposal is selected for funding, we would be pleased to provide you a copy of our final report.

Sincerely,


Eliska Rejmankova
Associate Professor



Post Office Box 115
Fairfield, California 94533
(707) 428-7580

15 April 1999

CALFED Bay-Delta Program
Ecosystem Restoration Projects and Programs
1416 Ninth Street, Suite 1155
Sacramento, California 95814

**Re: Support Letter for Dr. Eliska Rejmankova, UC Davis
1999 CALFED Proposal**

Dear CALFED Restoration Staff:

Solano Farmlands & Open Space Foundation enthusiastically supports the proposed project: "Reintroduction of Endangered Soft Bird's Beak to Restored Habitat in Suisun Marsh: Restoration Strategies for Rare Plant and Tidal Marsh Community Recovery" submitted by Professor Eliska Rejmankova of the University of California, Davis.

The Foundation owns Rush Ranch, a 2,070 acre property in Solano County situated along the northern edge of Suisun Marsh with over 1,050 acres of tidal wetlands. These wetlands represent most of the undiked tidal wetlands remaining in the marsh. The Ranch was purchased by the Solano County Farmlands & Open Space Foundation (Foundation) in May 1998 using funds provided by the State Coastal Conservancy.

In 1991, we restored tidal action to the Spring Branch Marsh area of the property. The reintroduction of this rare plant to Spring Branch Marsh restoration site supports the mission of the Rush Ranch Management Enhancement and Management Plan. The public trust mission for Rush Ranch will ensure conservation of the new rare plant population. Scientific data generated from this study will assist us with tidal marsh enhancement objectives in the future.

We are especially enthusiastic about Phase 4 of this proposal, as Rush Ranch stewardship staff and conservation volunteers will benefit from interaction with UC Davis restoration ecologists, and will participate in long term monitoring of the rare plant population. We are also very supportive of the proposal to develop an interpretive display at Rush Ranch to inform the public of the importance of rare plant conservation.

We support the UC Davis proposal to conduct this research on Rush Ranch and encourage CALFED to fully fund this proposal.

Sincerely,


Pamela C. Muick, Ph.D.
Executive Director

cc: Board of Directors
Rush Ranch Educational Council
Professor Eliska Rejmankova, UC Davis

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**STANDARD CLAUSES -
INTERAGENCY AGREEMENTS**

Audit Clause. For contracts in excess of \$10,000, the contracting parties shall be subject to the examination and audit of the State Auditor for a period of three years after final payment under the contract. (Government Code Section 8546.7).

Availability of Funds. Work to be performed under this contract is subject to availability of funds through the State's normal budget process.

Interagency Payment Clause. For services provided under this agreement, charges will be computed in accordance with State Administrative Manual Section 8752 and 8752.1.

Termination Clause. Either State agency may terminate this contract upon 30 days advance written notice. The State agency providing the services shall be reimbursed for all reasonable expenses incurred up to the date of termination.

Severability. If any provision of this Agreement is held invalid or unenforceable by any court of final jurisdiction, it is the intent of the parties that all other provisions of this Agreement be construed to remain fully valid, enforceable, and binding on the parties.

Y2K Language. The Contractor warrants and represents that the goods or services sold, leased, or licensed to the State of California, its agencies, or its political subdivisions, pursuant to this Agreement are "Year 2000 compliant" For purposes of this Agreement, a good or service is year 2000 compliant if it will continue to fully function before, at, and after the Year 2000 without interruption and, if applicable, with full ability to accurately and unambiguously process, display, compare, calculate, manipulate, and otherwise utilize date information. This warranty and representation supersedes all warranty disclaimers and limitations and all limitations on liability provided by or through the Contractor.

ASSURANCES - NON-CONSTRUCTION PROGRAMS

Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0040), Washington, DC 20503.

**PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET.
SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the awarding agency. Further, certain Federal awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

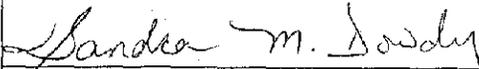
1. Has the legal authority to apply for Federal assistance and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project cost) to ensure proper planning, management and completion of the project described in this application.
2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the award; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.
3. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.
4. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.
5. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§472B-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).
6. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§1681-1683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of 1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.
7. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal or federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.
8. Will comply, as applicable, with provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

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Prescribed by OMB Circular A-102

9. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327-333), regarding labor standards for federally-assisted construction subagreements.
10. Will comply, if applicable, with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is \$10,000 or more.
11. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91-190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).
12. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.
13. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).
14. Will comply with P.L. 93-348 regarding the protection of human subjects involved in research, development, and related activities supported by this award of assistance.
15. Will comply with the Laboratory Animal Welfare Act of 1966 (P.L. 89-544, as amended, 7 U.S.C. §§2131 et seq.) pertaining to the care, handling, and treatment of warm blooded animals held for research, teaching, or other activities supported by this award of assistance.
16. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.
17. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."
18. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL 	TITLE Sandra M. Dowdy Contracts and Grants Analyst
APPLICANT ORGANIZATION THE REGENTS OF THE UNIVERSITY OF CALIFORNIA	DATE SUBMITTED APR 15 1999

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U.S. Department of the Interior

**Certifications Regarding Debarment, Suspension and
Other Responsibility Matters, Drug-Free Workplace
Requirements and Lobbying**

Persons signing this form should refer to the regulations referenced below for complete instructions:

Certification Regarding Debarment, Suspension, and Other Responsibility Matters - Primary Covered Transactions - The prospective primary participant further agrees by submitting this proposal that it will include the clause titled, "Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transaction," provided by the department or agency entering into this covered transaction, without modification, in all lower tier covered transactions and in all solicitations for lower tier covered transactions. See below for language to be used; use this form for certification and sign; or use Department of the Interior Form 1954 (DI-1954). (See Appendix A of Subpart D of 43 CFR Part 12.)

Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion - Lower Tier Covered Transactions - (See Appendix B of Subpart D of 43 CFR Part 12.)

Certification Regarding Drug-Free Workplace Requirements - Alternate I. (Grantees Other Than Individuals) and Alternate II. (Grantees Who are Individuals) - (See Appendix C of Subpart D of 43 CFR Part 12)

Signature on this form provides for compliance with certification requirements under 43 CFR Parts 12 and 18. The certifications shall be treated as a material representation of fact upon which reliance will be placed when the Department of the Interior determines to award the covered transaction, grant, cooperative agreement or loan.

**PART A: Certification Regarding Debarment, Suspension, and Other Responsibility Matters -
Primary Covered Transactions**

CHECK ___ IF THIS CERTIFICATION IS FOR A PRIMARY COVERED TRANSACTION AND IS APPLICABLE.

- (1) The prospective primary participant certifies to the best of its knowledge and belief, that it and its principals:
 - (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;
 - (b) Have not within a three-year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
 - (c) Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1)(b) of this certification; and
 - (d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause or default.
- (2) Where the prospective primary participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

**PART B: Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion -
Lower Tier Covered Transactions**

CHECK ___ IF THIS CERTIFICATION IS FOR A LOWER TIER COVERED TRANSACTION AND IS APPLICABLE.

- (1) The prospective lower tier participant certifies, by submission of this proposal, that neither it nor its principals is presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.
- (2) Where the prospective lower tier participant is unable to certify to any of the statements in this certification, such prospective participant shall attach an explanation to this proposal.

04-2018
March 1995
Title from Consolidation DI-1952, DI-1954,
DI-1955, DI-1956 and DI-1963

PART C: Certification Regarding Drug-Free Workplace Requirements

CHECK IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS NOT AN INDIVIDUAL.

Alternate I. (Grantees Other Than Individuals)

A. The grantee certifies that it will or continue to provide a drug-free workplace by:

- (a) Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the grantee's workplace and specifying the actions that will be taken against employees for violation of such prohibition;
- (b) Establishing an ongoing drug-free awareness program to inform employees about--
 - (1) The dangers of drug abuse in the workplace;
 - (2) The grantee's policy of maintaining a drug-free workplace;
 - (3) Any available drug counseling, rehabilitation, and employee assistance programs; and
 - (4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace;
- (c) Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph (a);
- (d) Notifying the employee in the statement required by paragraph (a) that, as a condition of employment under the grant, the employee will --
 - (1) Abide by the terms of the statement; and
 - (2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;
- (e) Notifying the agency in writing, within ten calendar days after receiving notice under subparagraph (d)(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer on whose grant activity the convicted employee was working, unless the Federal agency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;
- (f) Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph (d)(2), with respect to any employee who is so convicted --
 - (1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or
 - (2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;
- (g) Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs (a) (b), (c), (d), (e) and (f).

B. The grantee may insert in the space provided below the site(s) for the performance of work done in connection with the specific grant:

Place of Performance (Street address, city, county, state, zip code)

Field Sites: Lusk Ranch - Hill St. Wildlife Area - Grassy Isl. - Ad. Susan Marsh (Seismicity)
Primary lab/analysis: 3601 Wickson Hall Dept. of Environmental Science & Policy, University of California, Davis
One Shields Avenue, Davis, CA 95616

Check if there are workplaces on file that are not identified here.

PART D: Certification Regarding Drug-Free Workplace Requirements

CHECK IF THIS CERTIFICATION IS FOR AN APPLICANT WHO IS AN INDIVIDUAL.

Alternate II. (Grantees Who Are Individuals)

- (a) The grantee certifies that, as a condition of the grant, he or she will not engage in the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance in conducting any activity with the grant;
- (b) If convicted of a criminal drug offense resulting from a violation occurring during the conduct of any grant activity, he or she will report the conviction, in writing, within 10 calendar days of the conviction, to the grant officer or other designee, unless the Federal agency designates a central point for the receipt of such notices. When notice is made to such a central point, it shall include the identification number(s) of each affected grant.

**APPLICATION FOR
FEDERAL ASSISTANCE**

OMB Approval No. 0348-0043

1. TYPE OF SUBMISSION: Application <input type="checkbox"/> Construction <input type="checkbox"/> Non-Construction Preapplication <input type="checkbox"/> Construction <input type="checkbox"/> Non-Construction	2. DATE SUBMITTED	Applicant Identifier
	3. DATE RECEIVED BY STATE	State Application Identifier
	4. DATE RECEIVED BY FEDERAL AGENCY	Federal Identifier

5. APPLICANT INFORMATION

Legal Name: _____ Organizational Unit: _____

Address (give city, county, State, and zip code): _____ Name and telephone number of person to be contacted on matters involving this application (give area code) _____

6. EMPLOYER IDENTIFICATION NUMBER (EIN):
 [] [] - [] [] [] [] [] [] [] []

7. TYPE OF APPLICANT: (enter appropriate letter in box)

<input type="checkbox"/> A. State	<input type="checkbox"/> H. Independent School Dist.
<input type="checkbox"/> B. County	<input type="checkbox"/> I. State Controlled Institution of Higher Learning
<input type="checkbox"/> C. Municipal	<input type="checkbox"/> J. Private University
<input type="checkbox"/> D. Township	<input type="checkbox"/> K. Indian Tribe
<input type="checkbox"/> E. Interstate	<input type="checkbox"/> L. Individual
<input type="checkbox"/> F. Intermunicipal	<input type="checkbox"/> M. Profit Organization
<input type="checkbox"/> G. Special District	<input type="checkbox"/> N. Other (Specify) _____

8. TYPE OF APPLICATION:
 New Continuation Revision

If Revision, enter appropriate letter(s) in box(es): [] []

A. Increase Award B. Decrease Award C. Increase Duration
 D. Decrease Duration Other (specify): _____

9. NAME OF FEDERAL AGENCY: _____

10. CATALOG OF FEDERAL DOMESTIC ASSISTANCE NUMBER:
 [] [] - [] [] [] []

11. DESCRIPTIVE TITLE OF APPLICANT'S PROJECT:
 TITLE: _____

12. AREAS AFFECTED BY PROJECT (Cities, Counties, States, etc.): _____

13. PROPOSED PROJECT		14. CONGRESSIONAL DISTRICTS OF:	
Start Date	Ending Date	a. Applicant	b. Project
15. ESTIMATED FUNDING:		16. IS APPLICATION SUBJECT TO REVIEW BY STATE EXECUTIVE ORDER 12372 PROCESS?	
a. Federal	\$	a. YES. THIS PREAPPLICATION/APPLICATION WAS MADE AVAILABLE TO THE STATE EXECUTIVE ORDER 12372 PROCESS FOR REVIEW ON: DATE _____	
b. Applicant	\$	b. No. <input type="checkbox"/> PROGRAM IS NOT COVERED BY E. O. 12372	
c. State	\$	<input type="checkbox"/> OR PROGRAM HAS NOT BEEN SELECTED BY STATE FOR REVIEW	
d. Local	\$		
e. Other	\$		
Program Income	\$		
TOTAL	\$	17. IS THE APPLICANT DELINQUENT ON ANY FEDERAL DEBT? <input type="checkbox"/> Yes If "Yes," attach an explanation. <input type="checkbox"/> No	

8. TO THE BEST OF MY KNOWLEDGE AND BELIEF, ALL DATA IN THIS APPLICATION/PREAPPLICATION ARE TRUE AND CORRECT, THE DOCUMENT HAS BEEN DULY AUTHORIZED BY THE GOVERNING BODY OF THE APPLICANT AND THE APPLICANT WILL COMPLY WITH THE ATTACHED ASSURANCES IF THE ASSISTANCE IS AWARDED.

Type Name of Authorized Representative	b. Title	c. Telephone Number
Signature of Authorized Representative		e. Date Signed

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**PART E: Certification Regarding Lobbying
Certification for Contracts, Grants, Loans, and Cooperative Agreements**

*CHECK IF CERTIFICATION IS FOR THE AWARD OF ANY OF THE FOLLOWING AND
THE AMOUNT EXCEEDS \$100,000: A FEDERAL GRANT OR COOPERATIVE AGREEMENT;
SUBCONTRACT, OR SUBGRANT UNDER THE GRANT OR COOPERATIVE AGREEMENT.*

*CHECK IF CERTIFICATION IS FOR THE AWARD OF A FEDERAL
LOAN EXCEEDING THE AMOUNT OF \$150,000, OR A SUBGRANT OR
SUBCONTRACT EXCEEDING \$100,000, UNDER THE LOAN.*

The undersigned certifies, to the best of his or her knowledge and belief, that:

- (1) No Federal appropriated funds have been paid or will be paid, by or on behalf of the undersigned, to any person for influencing or attempting to influence an officer or employee of an agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into of any cooperative agreement, and the extension, continuation, renewal, amendment, or modification of any Federal contract, grant, loan, or cooperative agreement.
- (2) If any funds other than Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form-LLL, "Disclosure Form to Report Lobbying," in accordance with its instructions.
- (3) The undersigned shall require that the language of this certification be included in the award documents for all subawards at all tiers (including subcontracts, subgrants, and contracts under grants, loans, and cooperative agreements) and that all subrecipients shall certify accordingly.

This certification is a material representation of fact upon which reliance was placed when this transaction was made or entered into. Submission of this certification is a prerequisite for making or entering into this transaction imposed by Section 1352, title 31, U.S. Code. Any person who fails to file the required certification shall be subject to a civil penalty of not less than \$10,000 and not more than \$100,000 for each such failure.

As the authorized certifying official, I hereby certify that the above specified certifications are true.

SIGNATURE OF AUTHORIZED CERTIFYING OFFICIAL



TYPED NAME AND TITLE

Sandra M. Dowdy
Contracts and Grants Analyst

APR 15 1999

DATE