Project Information

2005 Proposal Number: 0084

Proposal Title: **Wintering Waterbird Response to CALFED's Environmental Water Account Program: Modeling and Monitoring to Better Integrate Agriculture and Management of Wetland Dependent Birds**

Applicant Organization Name: **U. S. Geological Survey–Western Ecological Research Center**

Total Amount Requested: $**1,140,163**

ERP Regions: Delta Region, Bay Region, Sacramento Region, San Joaquin Region, outside

Short Description

Project seeks to understand how water transfers from croplands affect wetland−dependent birds (e.g., greater sandhill cranes).

Executive Summary

The Environmental Water Account (EWA) and Wintering Waterbirds Project seeks to determine, model, and evaluate relationships between waterbird ecology and landscape features impacted by EWA and use adaptive management protocol to guide implementation of the EWA program to best contribute to the conservation and recovery of threatened Greater Sandhill Cranes (Grus canadensis tabida) and to enhance and/or maintain the diversity, abundance, and distribution of waterfowl and shorebirds. These goals of improving predictions of the performance of CALFED and guiding the EWA program and will be accomplished through management of a coordinated project (TASK 1) where we collect pertinent baseline information on Greater Sandhill Crane ecology in the Sacramento Valley (TASK 2), develop existing and new information on waterfowl, crane, and shorebird distribution, movements, and habitat use relative to availability of winter−flooded rice and other habitats into a model and predict impacts of a range of EWA scenarios on

ecology of these wintering waterbirds (TASK 3), and evaluate response of wintering waterbirds to EWA and other CALFED and CVPIA programs relative to those predictions (TASK 4).

CALFED's Environmental Water Account (EWA) program is an effort to increase the water available for meeting regional drinking water and aquatic wildlife needs by purchasing water from Central Valley farmers. Farmers would either fallow their field during summer (e.g., rice fields would not be farmed), or have the option to grow a less water intensive crop. However, the Central Valley of California is one of the most important waterbird wintering areas in the world, supporting large concentrations of migratory waterfowl, shorebirds, and other waterbirds. Wetlands and agricultural fields, especially post−harvest flooded rice fields in the Sacramento Valley rice growing region, provide critical waterbird habitat. Thus, an EWA program that changes area, management, or distribution of these habitats may greatly impact waterbird distribution, movements, abundance, and other aspects of their ecology.

This project fits this PSP's definintion of a "Priority Project", as it will directly "assess how water transfers from croplands affect wetland dependent species" and help predict and measure "..potential effects of adopting these practices on a large scale". (see Chapter 2 of this PSP). It will support CALFED's objective to implement EWA in a way that minimizes impact on at−risk native species, including the Greater Sandhill Crane (Grus canadensis tabida) (CALFED 2003). The Greater Sandhill Crane is also listed as Threatened under the California Endangered Species Act. Recovery of at−risk native species is the number one goal of CALFED's Ecosystem Restoration Project (California Bay−Delta Authority 2003). CALFED's species goal for Greater Sandhill Cranes is: "Consistent with CALFED's mission, achieve recovery objectives identified in the Pacific Flyway Management Plan for the Central Valley population of greater sandhill cranes [Pacific Flyway Council 1997] and in Assembly Bill 1280 legislation that apply to the CALFED Problem Area, the Butte Sink, and other areas used by these species."

This project will also support CALFED's objective for

waterbirds to implement EWA in a way that enhances and/or conserves the diversity, distribution, and abundance of native waterfowl, shorebirds, and wading birds (ERP Strategic Goal 1, Objectives 3 and 4) as well as undertaking actions to maintain harvested species at levels that support viable harvest (ERP Strategic Goal 3, Objective 3). CALFED's Terrestrial and Amphibious Monitoring Program (TAMP) calls for monitoring of CALFED effects at both the local (patch) and regional level. This is especially relevant for highly mobile waterbirds, for which a true measure of response to the EWA must include both a local and regional evaluation. For instance, project−specific surveys of restored wetlands often show a wide temporal and geographical variance in waterbird abundance that can only be interpreted correctly if waterbird distribution and movement patterns throughout the Central Valley are measured. This project will provide a landscape perspective, which is critical for interpreting response of waterfowl, cranes, and other waterbirds to individual CALFED projects.

Wintering Waterbird Response to CALFED's Environmental Water Account Program: Modeling and Monitoring to Better Integrate Agriculture and Management of Wetland Dependent Birds

A. Project Description

1. Problem

CALFED's Environmental Water Account (EWA) Program is an effort to increase the water available for meeting regional drinking water and aquatic wildlife needs by purchasing water from Central Valley farmers. Farmers would either fallow their field during summer (e.g., rice fields would not be farmed), or they might have the option to grow a less water-intensive crop. However, the Central Valley of California is also one of the most important waterbird wintering areas in the world, supporting large concentrations of migratory waterfowl, shorebirds, and other waterbirds such as the threatened Greater Sandhill Crane (*Grus canadensis tabida*) (Gilmer et al., 1982, U.S. Fish and Wildlife Service 1978). Wetlands and agricultural fields, especially post-harvest flooded rice fields in the Sacramento Valley rice growing region (Figure 1), provide critical waterbird habitat. An EWA program that changes area, management, or distribution of these habitats may greatly impact waterbird distribution, movements, abundance, and other aspects of their ecology. This in turn, would impact farmer economic opportunity that could be gained from waterfowl hunting leases. The problem we are seeking to address is how CALFED's EWA program can best be implemented to maintain an economically healthy agricultural system, contribute to the conservation and recovery of threatened Greater Sandhill Cranes, and enhance and/or maintain the diversity, abundance, and distribution of waterfowl and shorebirds.

2. Goals and Objectives

To guide the EWA program, we propose to manage a coordinated project (TASK 1) where we will collect pertinent baseline information on Greater Sandhill Crane ecology in the Sacramento Valley (TASK 2), develop existing baseline information on waterfowl, crane, and shorebird distribution, movements, and habitat use relative to availability of winter-flooded rice and other habitats (Fleskes et al. 2005a, Shuford et al. 1998) into a model to predict impacts of a range of EWA scenarios on ecology of these wintering waterbirds (TASK 3), and evaluate the response of wintering waterbirds to EWA and other CALFED and CVPIA programs (TASK 4).

(PLEASE NOTE: Tasks 2, 3, and 4 can each be funded and accomplished as independent projects. However, we present these tasks as an integrated project because each relates to EWA program effects on wintering waterbirds and provides complimentary information to guide EWA that can be obtained most efficiently as part of a coordinated project. Considering all key waterbird taxa together assures that potential management recommendations focused on a specific species does not adversely affect the others. Tasks 2 and 4 both require radio-tracking and aerial surveys in the Sacramento Valley and planning these as a coordinated project has reduced the costs below

conducting this work separately. Results of Task 3 will be improved by incorporating results of Tasks 2 and 4.)

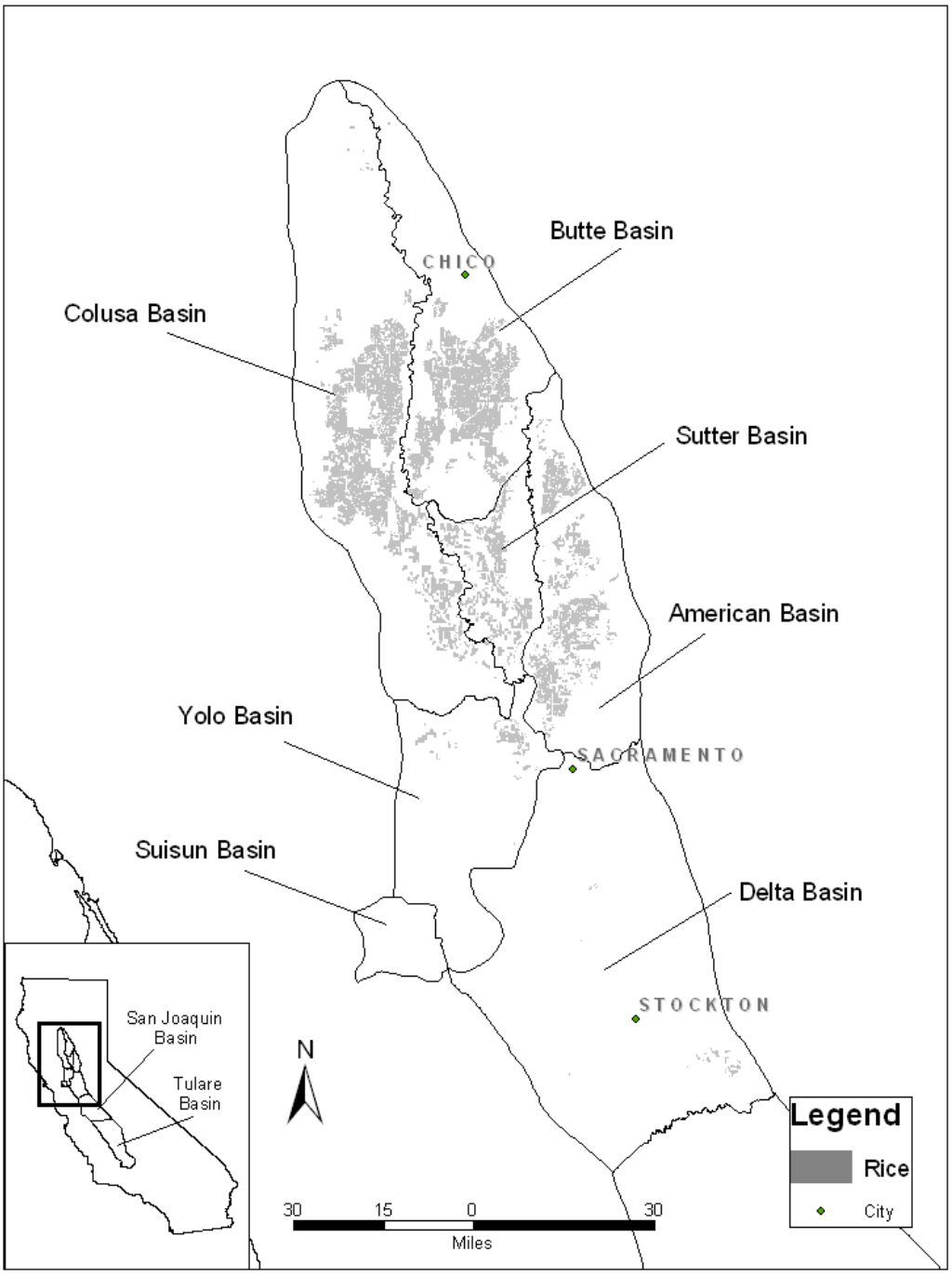

Figure 1. Rice Fields in the Sacramento Valley and Delta during 1999-2000 determined from satellite imagery (Fleskes et al. 2005b).

TASK 1-Project Management: Project management (TASK 1) will be conducted by personnel of the USGS-Western Ecological Research Center. Duties will include coordination of Tasks 2, 3, and 4, report production, and website development and management. A project website will be developed and hosted on the USGS-WERC webpage (www.werc.usgs.gov). The website will include a project description and periodically updated with significant findings. Funding to manage the project and conduct TASKs 2-4 will be directed to USGS-WERC. Much of the funding for TASK 2 will be passed through USGS to Oregon State University to support data collection, analysis and summary.

TASK 2-Greater Sandhill Crane Habitat Use and Movements Relative to EWA:
CALFED's objective is to implement EWA in a way that minimizes impact on at-risk native species, including the Greater Sandhill Crane (*Grus canadensis tabida*) (CALFED 2003). The Greater Sandhill Crane is also listed as Threatened under the California Endangered Species Act. Recovery of at-risk native species is the number one goal of CALFED's Ecosystem Restoration Project (California Bay-Delta Authority 2003). CALFED's species goal for Greater Sandhill Cranes is: "Consistent with CALFED's mission, achieve recovery objectives identified in the Pacific Flyway Management Plan for the Central Valley population of greater sandhill cranes [Pacific Flyway Council 1997] and in Assembly Bill 1280 legislation that apply to the CALFED Problem Area, the Butte Sink, and other areas used by these species." (CALFED 2000). The EWA EIS/EIR recognized the EWA could impact cranes. To minimize this possibility, the plan indicates EWA should be implemented to: "avoid or minimize actions near known [crane] wintering areas in the Butte Sink (from Chico in the north to the Sutter Buttes and from Sacramento River in the west to Highway 99) that could adversely affect foraging and roosting habitat." (CALFED 2003). However, the specified "avoid" boundary does not encompass all the crane wintering sites in the Sacramento Valley as there are Sandhill Crane use areas in rice croplands west of the Sacramento River (G. Ivey, pers. obs.). Conversely, the specified boundary likely includes rice fields which are not used by cranes because of their location relative to suitable roost sites, possibly limiting CALFED's options for implementing EWA. Additionally, although not directed specifically at cranes, the EWA plan specifies that crop substitutions may be used; this strategy could be used in crane use areas if crane-compatible substitution crops were identified and recommended to farmers.

Our goal is to provide CALFED with the greatest number of options for implementing EWA while minimizing impacts to wintering Sandhill Cranes. To achieve this goal, we need to identify: 1) specific boundaries of crane use areas: 2) the locations of all key crane roosts in the Sacramento Valley; 3) how large a buffer area around known roost sites is required to prevent EWA from impacting potential crane foraging habitat; and, 4) crane-compatible crop substitution options. We need detailed information on crane foraging habitat requirements and movement patterns to understand critical links between crane roost sites and surrounding privately owned lands. We propose a monitoring and targeted research project to fill key gaps in our understanding of wintering Sandhill Crane

ecology in the Sacramento Valley. Results will be used to assess the potential impacts of the EWA Program on cranes and to develop recommendations for crane-compatible land-use and management strategies for the Sacramento Valley. Based on the specific information needs and questions raised above, we propose the following objectives:

1. Characterize Greater Sandhill Crane habitat use patterns with a focus on the use of fallow rice fields and other crop types available in the Sacramento Valley.
2. Characterize the daily movement of Greater Sandhill Cranes between roosts and foraging fields and seasonal movements between use areas (i.e., periods of activity by individuals centered around different roosts) in the Sacramento Valley.
3. Locate and map all roost sites used by wintering cranes in the Sacramento Valley.

TASK 3-Modeling Impacts of EWA Scenarios on Waterbird Ecology: CALFED's objective regarding waterbirds is to implement EWA in a way that enhances and/or conserves the diversity, distribution, and abundance of native waterfowl, shorebirds, and wading birds (ERP Strategic Goal 1, Objectives 3 and 4) as well as undertaking actions to maintain harvested species at levels that support viable harvest (ERP Strategic Goal 3, Objective 3).

The Central Valley of California is one of the most important waterbird wintering areas in the world, supporting large concentrations of migratory waterfowl, shorebirds, and other waterbirds (Gilmer et al., 1982, U.S. Fish and Wildlife Service 1978). Wetlands and agricultural fields, especially post-harvest flooded rice fields in the Sacramento Valley rice growing region (Figure 1), provide critical waterbird habitat. An EWA program that changes area, management, or distribution of these habitats may greatly impact waterbird distribution, movements, abundance, and other aspects of their ecology.

CALFED's Terrestrial and Amphibious Monitoring Program (TAMP) calls for monitoring of CALFED effects at both the local (patch) and regional level. This is especially relevant for highly mobile waterbirds, for which a true measure of response to the EWA must include both a local and regional evaluation. For instance, project-specific surveys of restored wetlands often show a wide temporal and geographical variance in waterbird abundance that can only be interpreted correctly if waterbird distribution and movement patterns throughout the Central Valley are measured. Thus, a landscape perspective is critical for interpreting response of waterfowl, cranes, and other waterbirds to individual CALFED projects.

Baseline information from before CALFED began is available on wintering waterbird distribution, movements, habitat use, and survival in California to predict and evaluate waterbird response to various EWA scenarios. Fleskes et al. (2005a) studied and compared wintering waterbird ecology relative to the availability and distribution of winter-flooded rice and other habitats during 1970-1994 and 1998-2000. That study used landsat imagery to evaluate change in area and distribution of winter-flooded rice fields (Fleskes et al. 2005b) and other habitats, aerial surveys of ducks, geese, swans, and sandhill cranes conducted by the USFWS and California Department of Fish and Game (USFWS 1978, USFWS unpubl. data), and radio telemetry studies of 3 of the most

prevalent wintering species, northern pintails (*Anas acuta*) (Miller et al. 1993, Miller et al. 1995, Casazza 1995, Fleskes et al. 2002, Fleskes et al. 2005a), mallards (*A. platyrhynchos*) (Heitmeyer 1989, Day et al. 1990, Fleskes et al. 2005a), and greater white-fronted geese (*Anser albifrons*) (Takekawa et al. 1990, Fleskes et al. 2005a, Ackerman et al. In press) to determine response of waterfowl to landscape changes in the Central Valley. Shuford et al. (1998) surveyed Central Valley shorebird distribution during 1992-1995.

The objective of TASK 3 is to guide the EWA program by utilizing this baseline information on waterbird ecology relative to availability of rice fields and other habitats by modeling impacts of various EWA scenarios on wintering waterbird distribution, movement patterns, and habitat use.

Task 4-Monitoring EWA Effects on Waterbird Ecology: The maximum benefit for EWA program guidance can be obtained by comparing baseline information collected and modeled in TASKs 2 and 3 with similar information collected after the EWA program has been implemented. Therefore, assuming EWA will have begun implementation by the second year of this study, we propose to radio-track northern pintails in the Sacramento Valley and conduct aerial surveys of all waterbirds throughout the Central Valley to supplement EWA monitoring information gained from the radio-tracking of sandhill cranes (TASK 2). We will replicate methodology of Pre-EWA radio-telemetry and aerial survey work on waterbird ecology and compare results of Pre-EWA and Post-EWA. We will use landsat satellite imagery and other data sources to determine area and location of planted rice fields and winter-flooded rice fields. We will use this information to monitor change in rice and effects of EWA on regional and local waterbird distribution, movement patterns, and habitat use and test the predictions of the model developed during TASK 3.

3. Conceptual model

Information derived from this study would determine how water transfers from rice and other croplands would affect wetland-dependent birds and help guide decisions about fallowing of rice fields in the Sacramento Valley as part of the EWA. In addition, it would contribute to recovery planning for the Greater Sandhill Crane as well as management and conservation plans for State Wildlife Areas, National Wildlife Refuges and natural areas such as the Cosumnes River Preserve. Results would help guide wetland and cropland management, restoration, acquisition and easements programs of the U. S. Fish and Wildlife Service, Bureau of Land Management, California Department of Fish and Game, California Department of Water Resources, the Central Valley Joint Venture, Ducks Unlimited, California Waterfowl Association, The Nature Conservancy, and the Audubon Society. The information could also guide wildlife-friendly farming practices for cranes using private lands and assist the Natural Resource Conservation Service with design of wildlife enhancement projects on private lands. A well-designed EWA program could restore historic waterfowl abundance patterns in the Central Valley while maintaining viable waterfowl harvest rates and reducing risk of disease losses. Further, public support for EWA and other CALFED programs would likely increase as

the public learned of improved waterbird distribution and hunters experience improved harvest opportunity.

TASK 1- Project Management: Project management including coordination of Tasks 2, 3, and 4, report production, and website development and management are necessary for a fully successful project.

TASK 2-Greater Sandhill Crane Habitat Use and Movements Relative to EWA: Despite the importance of the Sacramento Valley rice lands to wintering Sandhill Cranes, their listing as at-risk, and the large number of dollars spent to acquire habitats relevant to cranes in the Valley, we can not fully assess the impacts of the EWA program to Sandhill Cranes because we lack answers to the critical questions raised above. Very little work has been conducted on the winter ecology of Pacific Flyway sandhill cranes. Limited research conducted to date includes a study of the distribution of Greater Sandhill Cranes (which focused on broad patterns of distribution between the Sacramento Valley, Delta, and San Joaquin Valley; Pogson and Lindstedt 1991); a study of habitat use in the Upper Butte Basin of the Sacramento Valley (Littlefield 2002), and a one-year study of crane use of the Delta region (Ivey and Herziger 2003).

To understand how EWA might impact crane use of specific areas it is important to understand their winter habitat needs. Conceptually, cranes require 2 key habitat components on wintering areas, suitable night roosting habitat and suitable foraging habitat (Tacha et al. 1994). Daily habitat use can be viewed as one or more round trip flights from a centrally located roost site to one or more foraging fields. To define the population of fields that a crane will potentially use during a single day, you can draw a circle around the roost site with the radius equal to the maximum distance a crane will travel on a daily foraging flight (this value is unknown for Sandhill Cranes in the Central Valley and may differ between the subspecies). Within this population of fields, an individual crane selects a specific field to use based on a number of variables ranging from the number and size of food items in each field, disturbance, predation risk, and social factors. This relationship of suitable roost site to adequate foraging habitat is the basic "ecosystem unit" for understanding conservation and management of wintering cranes.

Land use changes that occur within the basic ecosystem unit have the potential to affect crane use of an otherwise suitable roost site. For example, the loss of agricultural habitats around known crane roost sites to urbanization or conversions of row-crops to incompatible orchards and vineyards (Littlefield and Ivey 1999) can reduce the amount of food near a roost, potentially reducing the number of cranes using the roost. With a detailed understanding of crane foraging habitat use, crane-compatible crop substitutions could be identified that maintain habitat quality for cranes while still meeting CALFED's EWA water purchase objectives. It is not clear how fallowing of rice fields within the ecosystem unit will affect cranes.

We suggest the conceptual model described above provides a useful framework for identifying factors that potentially limit crane abundance in the Central Valley. Our

monitoring project is focused on gathering key empirical data needed to make the conceptual model relevant to cranes in the Sacramento Valley. Results from this study will allow CALFED to accurately assess the potential impact of EWA on cranes and help guide development of viable mitigation strategies if needed.

TASK 3- Modeling Impacts of EWA Scenarios on Waterbird Ecology: CALFED's stated ERP Goals of enhancing and/or maintaining the diversity, distribution, and abundance of waterfowl and shorebirds and viable harvest of waterfowl requires planning and implementation of EWA in a way that minimizes negative and maximizes positive effects on these species. Fleskes et al. (2002, 2005a) found that the ecology of waterfowl in the Central Valley changed in response to changing habitat conditions. For instance, the percentage of wintering waterfowl in the Sacramento Valley increased drastically in conjunction with an increase in planted and winter-flooded rice acreage in the Sacramento Valley. Further, daily flight distances and movement patterns of waterfowl in the Sacramento Valley became more restricted with increased acreage of winter-flooded rice (Fleskes et al. 2005a, Ackerman et al. In press), possibly providing less hunter opportunity while concentrating waterfowl populations in smaller ranges that could eventually increase the chance of catastrophic disease losses.

Thus, a well-designed EWA program could restore historic waterfowl abundance patterns in the Central Valley while maintaining viable waterfowl harvest rates and reducing risk of disease losses. Further, public support for EWA and other CALFED programs would likely increase as hunters in the Sacramento Valley and Central Valley basins to the south enjoy increased harvest opportunity as waterfowl search more widely for feeding and roosting areas or emigrate to other basins as acreage of rice decreases in the Sacramento Valley.

Task 4-Monitoring EWA Effects on Waterbird Ecology: As called for in TAMP, monitoring data are needed to determine waterbird response to EWA and measure any change in distribution, movement patterns, habitat use, and survival related to EWA and other CALFED programs. These monitoring data are also needed to test and improve the predictive model and improve EWA implementation. Northern pintails are the most appropriate species for additional radio-tracking because pre-CALFED information on their ecology is available, they are highly mobile and will be responsive to changes in area and management of rice fields (their preferred habitat), are a species of special concern due to historically low continental populations (unlike most other waterfowl) and yet are still among the most abundant in California and especially in the Sacramento Valley. Aerial surveys of the entire Central Valley are needed to provide a landscape perspective that is necessary to understand the scale of EWA impacts and interpret surveys of individual CALFED areas. No other monitoring framework exists with which to assess effects of CALFED actions on waterfowl as harvested species.

No work on cranes, ducks, geese, swans, or shorebirds has been funded by CALFED in the Sacramento Valley. During the winter of 2002-03, CALFED funded a Sandhill Crane monitoring program conducted on Staten Island in the Delta through a grant to The Nature Conservancy (Ivey and Herziger 2003). Pre-CALFED data on waterfowl ecology

was largely the result of a cooperative study funded by USGS, USFWS, USBOR, CDFG, Ducks Unlimited, Inc., California Waterfowl Association, Grassland Water District, and The Rice Foundation to investigate impacts of the Central Valley Joint Venture (CVJV) and changing agricultural practices on the ecology of waterfowl wintering in the Central Valley of California (Fleskes et al. 2005b).

4. Approach and Scope of Work

To guide the EWA program, we propose to manage a coordinated project (TASK 1) where we will collect pertinent baseline information on Greater Sandhill Crane ecology in the Sacramento Valley (TASK 2), develop existing information on waterfowl, crane, and shorebird distribution, movements, and habitat use relative to availability of winter-flooded rice and other habitats into a model to predict impacts of a range of EWA scenarios on ecology of these wintering waterbirds (TASK 3), and evaluate response of wintering waterbirds to EWA and other CALFED and CVPIA programs (TASK 4). We present these tasks as integrated project because each relates to EWA program effects on wintering waterbirds and provides complimentary information to guide EWA that can be obtained most efficiently as part of a coordinated project. Considering all key waterbird taxa together assures that potential management recommendations focused on a specific species does not adversely affect the others.

Field work for TASK 2 will be conducted during Years 1 and 2. TASK 3 model development will occur during Year 1 with EWA scenario modeling during Year 2. Field work for TASK 4 will be conducted during Year 2. Final data analysis, summary and final write-up for all tasks will be conducted during Year 3. The study area for TASK 2 will include the Sacramento Valley portion (i.e., Butte, Colusa, Sutter, American and Yolo Basins) of the Central Valley depicted in Figure 1. This area encompasses the major rice-growing region of the Central Valley which will be the main EWA focus area and a region historically important to Greater Sandhill Cranes, waterfowl, and other waterbirds. Modeling for TASK 3 will incorporate data collected throughout the Central Valley of California (Figure 2) but will focus especially on EWA impacts in the Sacramento Valley. For TASK 4, pintails will be captured and intensively radiotracked in the Sacramento Valley but will be located periodically tracked if they emigrate to other Central Valley basins. Aerial surveys for TASK 4 will be conducted in all Central Valley basins to determine waterbird distribution and measure how proportion of waterbirds in Sacramento Valley basins change with landscape changes related to EWA.

<u>TASK 2- Greater Sandhill Crane Habitat Use and Movements Relative to EWA:</u> For Objectives 1 and 2, we will use radio telemetry to study crane habitat use and movements. Radio-telemetry has been used successfully to study Sandhill Cranes elsewhere in there range (Bishop 1992, Duan et al. 1997, Bennet 1989). Beginning in September, we will trap 30 Greater Sandhill Cranes using rocket nets and noose traps (Hereford et al. 2000). Trapping will focus on birds on NWRs and State WAs, but other sites will be included if needed to achieve desired sample sizes. Each crane captured will be measured and banded with a unique color combination of bands. On one band we will attach a 30 g VHF transmitter. Although transmitters are commonly attached to neck

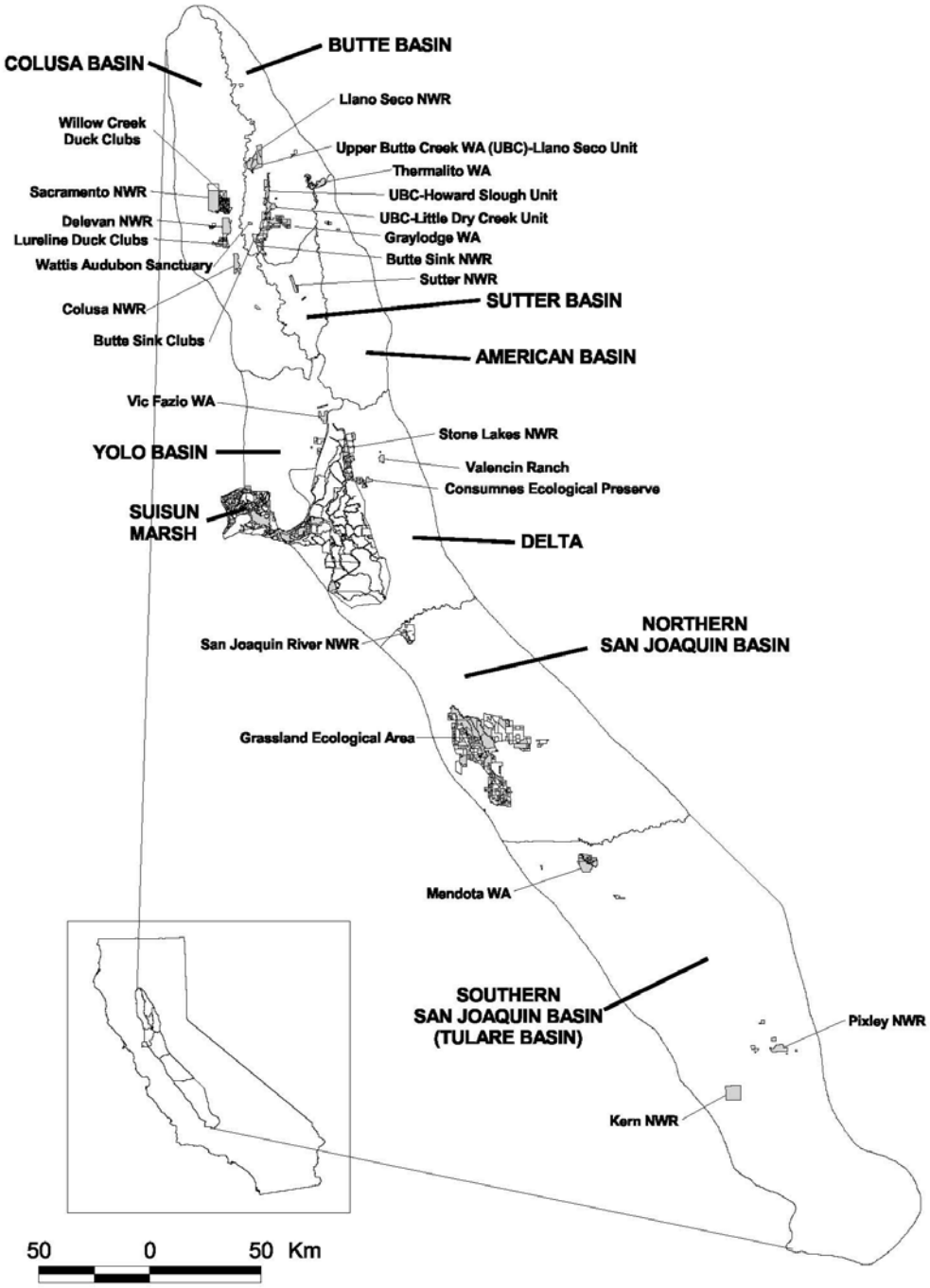

Figure 2. Central Valley Study Area, including basins and important waterbird areas.

bands (Babineau et al. 2004), as backpacks (Dwyer 1972) or surgically implanted (Korschgen et al. 1996) for other species of birds, leg band attachment is the most common method for cranes (e.g. Krapu and Brandt 2001). We will use truck mounted antennae (Cochran and Lord 1963) to locate individual birds twice daily, once on their roost and once in foraging fields. Each time a bird is located, we will record its location on a map of the study area as well as habitat type, flock size (during the day). We will record habitat type, flock size, and subspecies composition of foraging flocks containing radioed birds. Once every 2 weeks we will fly (Gilmer et al. 1982) to locate birds that have moved away from the primary study areas.

We will use a combination of minimum convex polygon and kernel estimation procedures GIS to estimate home range size for each subspecies (Worton 1989, 1995; Tufto et al. 1996). Data collected on transmitted cranes will be used to characterize habitat use and foraging habitat preferences. In addition, at select roost sites we will map habitat types around roost sites, to quantify habitat availability with the goal of measuring habitat preference. We will use these data to calculate foraging crop/habitat importance and estimate preference by comparing overall use by cranes versus crop/habitat availability. Additionally, we will conduct surveys from a truck around all roost sites used by cranes to identify crops used that might not occur in the landscapes around our intensively studied roosts.

For Greater Sandhill Crane Objective 3, we will locate and map all roost sites in the study area using ground and aerial surveys. Bi-weekly surveys will be conducted at major roost sites to document timing of arrival in fall and departure in spring, chronology of use, and peak population size following techniques described in Ivey and Herziger (2003). We will survey the entire study area once every 2 weeks from a plane to estimate the total crane population size, locate all key roost sites in the study area and identify other sites that seem suitable as crane roosts, but are not being used. We will design and test a statistically valid sampling strategy using aerial surveys to estimate the population of cranes within the entire Sacramento Valley. Sampling will be stratified by use-areas to reduce variance and increase the precision of our estimates. Aerial survey data will be supplemented with ground counts to adjust for species composition in order to allow estimation of populations of each subspecies. Subspecies will be identified visually using a spotting scope (Ivey et al. in prep). Dense ground fog in the Valley during winter can confound aerial survey efforts (Ivey and Dugger pers. obs.), fortunately the information we desire is not dependent on adhering to a strict flight schedule.

TASK 3- Modeling Impacts of EWA Scenarios on Waterbird Ecology: To model impacts of various EWA scenarios on waterbird ecology we will first develop models of the relationships between waterfowl and shorebird ecology and area and distribution of rice, winter-flooded rice and other waterbird wintering habitats during 1970-1994 and 1998-2000 (Fleskes et al. 2005a,b for ducks, geese, swans, and cranes; Shuford et al. 1998 for shorebird distribution). We will then use covariate values in simulation models (Frederick et al. 1992) to predict impacts of a range

of changes in area and distribution among Sacramento Valley basins of rice, winter-flooded rice, and other waterbird wintering habitats. In our initial modeling effort, we will use Akaike's Information Criterion (AIC) to select the best models of distance traveled from roosting to feeding sites, population range, distribution among basins, and habitats used. This approach often performs better than restricting the selected model to those variables with statistically significant effects in hypothesis-based tests, especially for observational data (Burnham and Anderson 1998, Anderson et al. 2000). We will use a second-order AIC for small sample sizes: AICc = -2(log-likelihood) + 2K(N / N – K – 1), where K is the number of fitted parameters including variance and N is the sample size (Burnham and Anderson 1998, Anderson et al. 2000). We will consider the model with the smallest AICc to be the most parsimonious (Burnham and Anderson 1998, Anderson et al. 2000) and use the AICc differences between the best model and the other candidate models (Δ_i = AICc_i – minimum AICc) to determine the relative ranking of each model; models for which $\Delta_i \leq 2$ have substantial support and were considered for biological importance (Burnham and Anderson 1998, Anderson et al. 2000, Anderson et al. 2001). We will conduct statistical analyses with SAS (SAS Institute Inc. 1999).

Task 4-Monitoring EWA Effects on Waterbird Ecology: We will replicate methodology of pre-EWA radio-telemetry on northern pintails and aerial surveys of ducks, geese, swans, cranes (Fleskes et al. 2005a) and shorebirds and compare results of Pre-EWA and Post-EWA. We will capture, radio-tag and radio-track 40 northern pintails in the Sacramento Valley to measure habitat use, movement patterns, distribution, flight distances, roost and feeding locations, and survival and compare these results with similar data collected during 1987-94 and 1998-2000 (see Fleskes et al. 2002, 2005a for specific methodology). To determine the effects of EWA and other CALFED programs on regional distribution of sandhill cranes, ducks, geese, swans, and shorebirds, we will conduct five complete Central Valley aerial surveys of these waterbird species, approximately bi-monthly, from September to April. We will match the timing of our aerial surveys with 1973-1982 and 1998-2000 surveys, when periodic aerial surveys of the entire Central Valley were last conducted. To facilitate comparison among periods and allow estimates in all Central Valley basins we will replicate the survey design of the 1998-2000 surveys (Fleskes et al. 2005a). We will calculate total use days, average birds per day, spline peak, interquartile range and median use date by interpolating among survey points and calculating area under the curve in each Central Valley basin. We will compare distribution during this study with distribution during 1978-89 and 1998-2000 for sandhill cranes, ducks, geese and swans (see Fleskes et al. 2005a) and 1992-95 for shorebirds (Shuford et al. 1998). We will obtain and analyze satellite imagery and other available data to measure change in area of rice, post-harvest flooded rice [see Fleskes et al. 2005], and wetland area, and relate changes in regional distribution to changes in these important waterbird habitats impacted by EWA and other CALFED programs.

5. Performance Evaluation

We will submit quarterly and annual reports for each part of the proposed work that will include financial status, activities during the period, tasks completed, products produced, problems encountered, and any modifications to the proposed work. A final technical

report describing the results of the studies with specific conservation and management recommendations will be submitted at the end of the project. We will also present our work in newsletter articles, presentations to local, state, and national organizations, workshops, presentations at scientific meetings, scientific publications, habitat models, a GIS data base, a web site for the project, and press releases.

6. Feasibility

The principal investigators each have extensive field experience directly applicable to performing their sections of work described in this proposal. We have a current MOU with California Department of Fish and Game, which allows trapping and handling of cranes. We have federal banding permits with auxillary marking permits to allow capture and radiotagging of waterfowl and cranes. We will apply for a state banding permit to allow the same. We will update current MOUs with CDFG and USFWS to access their lands to capture cranes and waterfowl. Radio-tracking can usually be accomplished from public roads but we will obtain permission to access lands as necessary for this study.

7. Data Handling, Storage, and Dissemination

All data collected during this project will be entered into electronic databases and will be stored on PCs. TASK 2 data will be archived at Oregon State University; TASK 3 and 4 data will be archived at USGS-Western Ecological Research Center. Data analysis will be done using ARC/GIS and with SAS and Program Mark and other related software. We will create a web site for this project and make the finalized data available through this site. We will also ship data other files as requested via email and conventional mail.

8. Information Value

This project will help determine how CALFED's EWA program can best be implemented to maintain an economically healthy agricultural system, contribute to the conservation and recovery of threatened Greater Sandhill Cranes, and maintain the diversity, abundance, and distribution of waterfowl and shorebirds. Baseline information collected on Greater Sandhill Crane ecology in the Sacramento Valley will be combined with existing baseline information on other waterbirds and developed into a model to predict impacts of a range of EWA scenarios on wintering ecology of waterbirds. This model will be tested by then evaluating the response of wintering waterbirds to EWA and other CALFED and CVPIA programs. Managers can then adjust their programs accordingly to obtain desired outcomes.

9. Public Involvement and Outreach

Our research will be shared with interpretive centers at associated Nature Preserves (e.g. Cosumnes Preserve), National Wildlife Refuges (NWRs; e.g., Sacramento NWR), and Wildlife Areas (e.g, Gray Lodge Wildlife Area) in the Valley for interpretation of crane and waterbird ecology to the visiting public. We would develop collaboration with the Lodi Crane Festival, where we would give talks at the festival to explain the needs of

wintering Sandhill Cranes and specific role of our research will play in making progress on biological planning for the species. We will also give similar presentations at other regional bird festivals (e.g., the Othello, Washington crane festival, Modoc NWR's Migratory Bird Festival, etc.). On a professional level, we would present the results of our research at various professional meetings such as The Wildlife Society's, National and Section meetings, the Waterbird Society's Annual meeting, the North American Duck Symposium, the Pintails Action Group, the North American Artic Goose Conference, and the North American Crane Working Group workshops. The final results of the studies would be presented for publication in a peer-reviewed wildlife journal.

10. Work Schedule

Date:	Activity Description (Task):
Sept. 2006-December 2006	Capture and Marking of Sandhill Cranes (2)
Sept. 2006-March 2007	Radio-Tracking of Sandhill Cranes (2)
Sept. 2006-August 2007	Model Pre-EWA Waterbird Ecology-Habitat Relationships (3)
August 2007	Annual report complete
Sept. 2006-December 2007	Capture and Marking of Sandhill Cranes and Pintails (2 & 4)
Sept. 2006-March 2007	Radio-Tracking of Cranes and Pintails (2 & 4)
Sept. 2006-April 2007	Bi-Monthly Aerial Waterbird Surveys (4)
Sept. 2007-August 2008	Model Impacts on Waterbird Ecology of EWA Scenarios (3)
August 2008	Second annual report.
August 2009	Final Report.

B. Applicability to CALFED Ecosystem Restoration and Science Programs, and CVPIA Goals and Priorities

1. Ecosystem Restoration and Science Programs, and CVPIA Goals and Priorities.

This project will help the Ecosystem Restoration Program by evaluating and predicting how water transfers from croplands will affect wetland-dependent birds. It will help the Science Program meet its goal of using the best possible scientific information to objectively determine results of CALFED's actions. It will use the adaptive management process of gathering and modeling baseline data on relation of waterbird ecology to habitats potentially impacted by EWA, predict responses to EWA, and measure actual responses to EWA actions. This will help meet CALFED's objective of implementing EWA in a way that minimizes impact on at-risk species, including the Greater Sandhill Crane (*Grus canadensis tabida*) (CALFED 2003) and aid recovery of at-risk native species (number one goal of CALFED's Ecosystem Restoration Project, California Bay-Delta Authority 2003). This project will also provide information so CALFED can meet its objective to implement EWA in a way that enhances and/or conserves the diversity, distribution, and abundance of native waterfowl, shorebirds, and wading birds (ERP

Strategic Goal 1, Objectives 3 and 4) as well as undertaking actions to maintain harvested species at levels that support viable harvest (ERP Strategic Goal 3, Objective 3).

2. Relationship to Other Ecosystem Restoration Actions, Monitoring Programs, or System-wide Ecosystem Benefits.

There are several CALFED programs that may impact wintering waterbirds. A total of 10,595 acres of sandhill crane habitat would be lost from implementing the In-Delta Storage Project (California Bay-Delta Authority 2003). Additionally, if there are levee integrity problems, it is likely that future failure of Delta levees would result in substantial crane habitat losses. In order to minimize negative impacts of projects such as fallowing rice fields or developing storage reservoirs in Delta islands, it is important to understand how far cranes will forage from roost sites to create biologically meaningful buffers for habitat conservation around roosts.

The Central Valley Joint Venture was established in 1986 with a goal of enhancing 380,000 ha of wetlands and agricultural lands in the Central Valley at a capital cost of more than $528 million and an annual cost of about $29 million to improve conditions for waterfowl and other waterbirds (Central Valley Habitat Joint Venture Implementation Board 1990). Habitat improvements thus far have included establishment of new state Wildlife Areas and National Wildlife Refuges, restoration of wetlands, and enhancement of agricultural lands for wildlife. A cooperative study (Fleskes et al. 2005a) funded by USGS, USFWS, USBOR, CDFG, Ducks Unlimited, Inc., California Waterfowl Assoication, The Rice Foundation, and Grassland Water District investigated impacts of the Central Valley Joint Venture (CVJV) and changing agricultural practices on the ecology of waterfowl wintering in the Central Valley of California. Results of this study will provide excellent baseline information to predict and monitor response of waterbirds to EWA.

3. Additional Information for Proposals Containing Land Acquisition.

This section is not applicable to the proposed work.

C. Qualifications and Organization.

Fleskes will be the project leader and will coordinate all aspects of the project with other co-investigators (Casazza and Yparraguirre) and subcontractors (Professor Dugger and PhD candidate Ivey). Fleskes, with Casazza's assistance, will manage the overall project and develop a website (TASK 1). Dugger and Ivey will collect pertinent baseline information on Greater Sandhill Crane ecology in the Sacramento Valley (TASK 2). Fleskes will lead development of a model to predict impacts of a range of EWA scenarios on ecology of these wintering waterbirds (TASK 3). Fleskes and Casazza will work to evaluate the response of wintering waterbirds to EWA and other CALFED and CVPIA programs and test the model (TASK 4). Yparraguirre will lead and coordinate aerial survey work for that task.

Qualifications are described below:

Joseph P. Fleskes, Ph.D. Wildlife Research Biologist, USGS-Western Ecological Research Center, Dixon CA. 1986 to present; Chair, Pintail Action Group-North American Waterfowl Management Plan. 2005 to present. Experience: Over 25 years of research experience on wetland-dependent wildlife and their habitats throughout North America with special emphasis on migratory waterfowl and other waterbirds in the Central Valley of California. Education: Ph.D. (1999) Wildlife Science, Oregon State University; M.S. (1986) Wildlife Biology, Iowa State University; B. S. (1980) Fisheries and Wildlife Biology, Iowa State University.

Five Selected Publications: 1. **Fleskes, J. P**., R. L. Jarvis, and D. S. Gilmer. 2002. Distribution and movements of female northern pintails radiotagged in the San Joaquin Valley, California. Journal of Wildlife Management 66:138-152. 2. **Fleskes, J. P**., R. L. Jarvis, and D. S. Gilmer. 2003. Selection of flooded agricultural fields and other landscapes by female northern pintails wintering in Tulare Basin, California. Wildlife Society Bulletin 31:793-8032. 3. **Fleskes, J.**, J. Yee, M. Casazza, J. Daugherty and B. Perry. 2005. Waterfowl distribution, movements and habitat use relative to recent habitat changes in the Central Valley of California: A cooperative project to investigate impacts of the Central Valley Habitat Joint Venture and changing agricultural practices on the ecology of wintering waterfowl. Published Final Report. U.S. Geological Survey, Dixon, CA. 190 pp. 4. Van Kessel, C., J. Eadie, W. Horwath, F. Reid, J. E. Hill, and **J. Fleskes**. 2002. Integrating agronomic management practices with waterfowl populations in rice fields: opportunities and mutual benefits. Pages 51-59 *in* J. E. Hill, and B. Hardy, editors, Proceedings of the Second Temperate Rice Conference, 13-17 June, 1999, Sacramento California. Los Banos (Phillippines): International Rice Research Institute. 714 pp. 5. **Fleskes, J. P**., W. M. Perry, K. L. Petrik, R. Spell, and F. Reid. 2005. Change in amount of winter-flooded and dry rice in the northern Central Valley of California determined by satellite imagery. California Fish and Game 91:207-215.

Gary L. Ivey. Ph.D. candidate, Oregon State University, Corvallis; Consulting Wildlife Biologist. Experience: Federal wildlife biologist at National Wildlife Refuges in Oregon and California for 18 years specializing in the ecology of migratory waterbirds, especially Sandhill Cranes with technical specialty in application of radio telemetry. Education: B.S.(1978) Wildlife Management, Humboldt State University, California; B.A. (1977) Biology, Humboldt State University, California.

Five selected Publications: 1) **Ivey, G. L**., C.P. Herziger, and T. Hoffmann. In prep. Annual movements of Pacific Coast Sandhill Cranes. Proc. of the 9th North American Crane Workshop. 2) **Ivey G. L.** and C. P. Herziger. 2003. Sandhill Crane Monitoring at Staten Island, San Joaquin County, California, 2002-03. The Nature Conservancy, Galt, California. 3) Littlefield, C. D., and **G. L. Ivey**. 2002. Washington State Recovery Plan for the Sandhill Crane. Washington Department of Fish and Wildlife, Olympia, WA. 4) **Ivey, G. L.,** and C. P. Herziger. 2001. Distribution of greater sandhill crane pairs in California, 2000. California Dept. Fish and Game, Sacramento, CA. 5) Littlefield, C. D., and **G. L. Ivey**. 1999. Conservation Assessment for Greater Sandhill Cranes wintering

on the Cosumnes River Floodplain and Delta regions of California. The Nature Conservancy, Galt, California.

Bruce D. Dugger, Ph.D. Mace Professor of Watchable Wildlife, Dept. Fisheries and Wildlife, Oregon State University. Experience: Avian ecologist specializing in ecology, conservation, and management of waterbirds, particularly during the non-breeding season, and management and restoration of wetland habitats. P.I. on research projects across the county and internationally for 12 years. Technical expertise includes application of telemetry to wildlife research, experimental design and sampling theory. Education: B.S. (1986) Fisheries and Wildlife, University California Davis; M.S. (1990) and Ph.D. in Wildlife Ecology from University of Missouri, Columbia.

Five Selected Publications: 1) Babineau, F. B., **B. D. Dugger**, D. Holm, and A. Woolf. 2004. Winter distribution and habitat use of Trumpeter swans in Illinois. 19th Proceedings of the Trumpeter Swan Society. 2) **Dugger, B. D**. and P. Blums. 2001. Impact of conspecific brood parasitism on host fitness for Tufted Duck and Common Pochard. Auk: 118:717-726. 3) **Dugger, B. D**. and M. J. Petrie. 2000. Geographic variation in foraging patterns of pre-incubating female Mallards. Canadian Journal of Zoology 78:2240-2243. 4) Dugger, K. M., **B. D. Dugger**, and L. H. Fredrickson. Annual survival of female Hooded Mergansers and Wood Ducks in southeast Missouri. 1999. Wilson Bulletin 111:1-6. 5) Anderson, D. H. and **B. D. Dugger**. 1998. A conceptual basis for evaluating restoration success. Trans. North Am. Wildlife and Nat. Res. Conference 63:1-7.

Michael L. Casazza, M.S. Senior Wildlife Biologist, Western Ecological Research Center, U.S. Geological Survey, 1989 to present. Experience: Principal Investigator studying a variety of wetland and avian species (giant garter snakes, waterfowl, band-tailed pigeons, greater sage-grouse). Expertise in animal capture, radio-telemetry, and habitat utilization studies. Education: M.S. 1995 Recreation Administration, California State University, Sacramento, B.S. 1988 Wildlife Biology, Univ. of California, Davis.

Five Selected Publications: **1) Casazza, M. L**. and M. R. Miller. 2000. The Northern Pintail. In: Goals Project 2000. Baylands Ecosystem Species and Community Profiles: Life histories and environmental requirements of key plants, fish, and wildlife. Prepared by the San Francisco Bay Area Wetland Ecosystem Goals Project. P.R. Olofson, editor. San Francisco Bay Regional Water Quality Control Board, Oakland, Calif. **2) Casazza** et al. In Press. Evaluation of Current Population Indices for Band-tailed Pigeons. Wildlife Society Bulletin. **3) Casazza, M. L**., G. D. Wylie, and C. J. Gregory. 2000. A funnel trap modification for surface collection of aquatic amphibians and reptiles. Herpetological Review 31(2), 91-92. **4)** Wylie, G.D., **M.L. Casazza**, and M. Carpenter. 2003. Diet of bullfrogs in relation to predation on giant garter snakes at Colusa National Wildlife Refuge. California Fish and Game 89(3): 139-145. **5)** Miller, M. R., J. P. Fleskes, J. Y. Takekawa, D. L. Orthmeyer, **M. L. Casazza**, and W. M. Perry. 2001. Satellite tracking of northern pintail spring migration from California, USA: the route to Chukotka, Russia. Casarca 7: 229-233.2.

Dan Yparraguirre, Senior Wildlife Biologist, Calif. Dept Fish and Game, 1992 - present. Experience: Specialist in waterfowl management and programs, including conducting aerial surveys and capture of waterfowl and other waterbirds. Education: M.S. (1982) in Natural Resources, specialization in Wildlife Management. Humboldt State University. B.S. (1977) in Wildlife Management, minor in Biology. Humboldt State University.

Selected publications: 1. Woolington, D.W., P.F. Springer and **D.R. Yparraguirre**. 1979. Migration and wintering distribution of Aleutian Canada geese. pp 299-309 in R.L. Jarvis and J.C. Bartonek eds. Management and Biology of Pacific Flyway Geese. OSU Bookstores. Corvalis, OR. 346 pp. 2. Greiner, E.C., D.J. Forrester, J.W. Carpenter and **D.R. Yparraguirre**. 1981. Coccidia of Aleutian Canada geese. Journ. Wildl. Dis. 17:365-370. 3. Fleskes, J.P., J.M. Hicks, D.S. Gilmer, and **D.R. Yparraguirre**. 1994. Changing patterns of goose harvest on California public hunting areas. Calif. Fish and Game.80(4)133-149. 4. Humburg, D.D., T.W. Aldrich, S. Baker, G. Costanzo, J.H. Gammonly, M.A. Johnson, R. Swift, and **D. Yparraguirre**. 2001. Adaptive Harvest Management: Has anything really changed? Trans. No. Amer. Wildl. and Natur. Resour. Conf. 66:78-93.

D. Cost

1. Budget

Task 1 (Project Management) will be part of any project. Tasks 2, 3, and 4 can each be funded and accomplished as an independent project. However, we present these three tasks as an integrated project because each relates to EWA program effects on wintering waterbirds and provides complimentary information to guide EWA that can be obtained most efficiently as part of a coordinated project. Considering all key waterbird taxa together assures that potential management recommendations focused on a specific species does not adversely affect the others. Tasks 2 and 4 both require radio-tracking and aerial surveys in the Sacramento Valley and planning these as a coordinated project has reduced the costs below conducting this work separately. Results of Task 3 will be improved by incorporating results of Tasks 2 and 4.

2. Cost-sharing

USGS-Western Ecological Research Center is contributing $115,000 worth of capture, marking, and radiotracking equipment including rocket nets, rockets, wire, detonators, scopes, binoculars, ATVs, boats, bird holding cages, electronic calipers, scales, banding equipment, electronic scanning receivers, headsets, compasses, truck and aircraft telemetry antennae, antennae mounting systems, computer programs, laptop computers and miscellaneous cables and other equipment. A portion of the supplies for TASK 2 will be provided by sharing with a related study being conducted along the Lower Columbia River in Oregon and Washington. California Dept. of Fish and Game is contributing approximately 48 hours of aircraft time, trained pilots, and and observers for some of the aerial waterbird surveys (Approx. value of $78,000).

We will seek additional in-kind support from USFWS refuges and Central Valley Joint Venture and NGOs including California Waterfowl Association and Ducks Unlimited. We will work cooperatively with local wildlife agency staff on NWRs and State WAs and the Audubon Society's Wattis Sanctuary. We would enlist volunteers from local Audubon Society members and related wildlife interests to assist with crane monitoring.

3. Long-term Funding Startegy

This study will establish baseline information, develop monitoring protocol, guide EWA by making predictions of response of waterbirds to various EWA scenarios, and monitor EWA impacts on waterbirds. Future studies to further monitor EWA impacts would be useful but are not planned as part of this proposal.

E. Compliance with Standard Terms and Conditions.

We agree with standard terms and conditions.

G. Literature Cited

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Frederick, R. B., W. R. Clark, and J. Y. Takekawa. 1992. Application of a computer simulation model to migrating white-fronted geese in the Klamath Basin. Pages 696-706 *in* D. R. McCollough and R. H. Barrett (eds.), Wildlife 2001: populations. Elsevier, NY.

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Worton, B. J. 1995. Using Monte Carlo simulation to evaluate kernel-based home range estimators Journal of Wildlife Management 59:794-800.

H. Nonprofit Verification.

Not Applicable.

Tasks And Deliverables

Task ID	Task Name	Start Month	End Month	Personnel Involved	Deliverables
1	Project Management	1	36	Fleskes, Joseph Casazza, Michael Wildlife Biologist-GS11, Wildlife Biologist-GS11	Semiannual and final reports
2	Greater Sandhill Crane Habitat Use and Movements Relative to EWA	1	36	Fleskes, Joseph Casazza, Michael Bruce, Dugger Ivey, Gary Research Techs, Research Techs	Annual Reports
3	Modeling Impacts of EWA Scenarios on Waterbird Ecology	1	36	Fleskes, Joseph Modeling Statistician, Modeling Statistician Data Technician, Data Technician	Annual Reports
4	Monitoring EWA Effects on Waterbird Ecology	13	36	Fleskes, Joseph Yparraguirre, Dan Data Technician, Data Technician Aerial Surveyors, Aerial Surveyors Telemetry Field Techs, Telemetry Field Techs GIS Specialist, GIS Specialist	Annual Reports

Total Project Budget Summary by Task and by Fiscal Year

Note: This budget summary **automatically links** to the costs and totals on the **"Budget Detail"** worksheet. **DO NOT CHANGE FORMULAS OR ENTER NUMBERS INTO ANY CELLS EXCEPT THE SHADED CELLS** for "Cost Share" and "Other Matching Funds"

BUDGET SUMMARY	Total Amount for Year 1	Total Amount for Year 2	Total Amount for Year 3	Total Amount for All Years
Total Costs for Task One	$ 19,409.56	$ 19,670.78	$ 20,599.16	$ 59,679.49
Total Costs for Task Two	$ 127,891.24	$ 129,189.46	$ 87,013.94	$ 344,094.64
Total Costs for Task Three	$ 90,011.11	$ 94,154.40	$ 97,944.78	$ 282,110.29
Total Costs for Task Four	$ -	$ 268,777.19	$ 114,247.51	$ 383,024.70
Total Costs for Task Five	$ -	$ -	$ -	$ -
Total Costs for Task Six	$ -	$ -	$ -	$ -
Total Costs for Task Seven	$ -	$ -	$ -	$ -
Total Costs for Task Eight	$ -	$ -	$ -	$ -
Total Costs for Task Nine	$ -	$ -	$ -	$ -
Total Costs for Task Ten	$ -	$ -	$ -	$ -
Total Costs for Task Eleven	$ -	$ -	$ -	$ -
Total Costs for Task Twelve	$ -	$ -	$ -	$ -
Total Costs for Task Thirteen	$ -	$ -	$ -	$ -
Total Costs for Task Fourteen	$ -	$ -	$ -	$ -
Total Costs for Task Fifteen	$ -	$ -	$ -	$ -
Total Costs for Project Tasks	$ 237,311.91	$ 511,791.83	$ 319,805.39	$ 1,068,909.13
1/Cost Share	$ -	$ -	$ -	$ -
2/ Other Matching Funds	$ -	$ -	$ -	$ -

1/ *Cost share funds* are specifically dedicated to your project and can include private and other State and Federal grants. Any funds listed in this line must be further described in the text of your proposal (see Chapter 3, Section D, of the PSP document)

2/ *Other matching funds* include other funds invested consistent with your project in your project area for which the ERP grant applicant is not eligible. Any funds listed in this line must be further described in the text of your proposal (see Chapter 3, Section D, of the PSP document)

Proposal Number
Proposal Name

Detailed Budget Breakdown by Task and by Fiscal Year

Applicant Name

BUDGET FOR TASK ONE (Administrative)	**TOTAL AMOUNT TASK 1 All Years**	**Year 1**			**Year 2**			**Year 3**		
		Amount per hour	**Number of Hours**	**Total Amount for Year 1**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 2**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 3**
Personnel										
Fleskes, Joseph,	$ 11,373.60	$ 45.10	80	$ 3,608.00	$ 47.35	80	$ 3,788.00	$ 49.72	80	$ 3,977.60
Casazza, Michael	$ 9,144.80	$ 36.26	80	$ 2,900.80	$ 38.07	80	$ 3,045.60	$ 39.98	80	$ 3,198.40
Wildlife Biologist GS-11	$ 7,152.80	$ 28.36	80	$ 2,268.80	$ 29.78	80	$ 2,382.40	$ 31.27	80	$
	$ -	$ -		$ -	$ -		$ -	$ -		$ 2,501.60
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
Personnel Subtotal	**$ 27,671.20**			**$ 8,777.60**			**$ 9,216.00**			**$ 9,677.60**
[1/] Benefits as percent of salary	33%			$2,922.94			$3,068.93			$3,222.64
Personnel Total (salary + benefits)	**$36,885.71**			**$11,700.54**			**$12,284.93**			**$12,900.24**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: software, office supplies, space rental, etc.)	$ 3,540.00			$ 1,500.00			$ 1,000.00			$ 1,040.00
2/ Travel and Per Diem	$ 1,700.00			$ 500.00			$ 600.00			$ 600.00
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ 5,240.00**			**$ 2,000.00**			**$ 1,600.00**			**$ 1,640.00**
[5/] Overhead Percentage (Applied to Personnel & Other Costs)	42%			$ 5,709.02			$ 5,785.85			$ 6,058.92
Total Costs for Task One	**$ 59,679.49**			**$ 19,409.56**			**$ 19,670.78**			**$ 20,599.16**

1/ Indicate your rate, and change formula in column immediately to the right of this cell

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3/ Please provide a list and cost of major equipment ($5,000 or more) to be purchased, and complete "Equipment Detail" Worksheet

4/ Please list each subcontractor and amounts (if subcontractor not selected yet, use function like "ditch construction subcontractor")

5/ Indicate rate in column immediately to the right of this cell; and provide a description of what expenses are covered by overhead. If overhead is > 15% must provide justification

Proposal Number
Proposal Name

Detailed Budget Breakdown by Task and by Fiscal Year

Applicant Name

BUDGET FOR TASK TWO	TOTAL AMOUNT TASK 2 All Years	Year 1 Amount per hour	Year 1 Number of Hours	Year 1 Total Amount for Year 1	Year 2 Amount per hour	Year 2 Number of Hours	Year 2 Total Amount for Year 2	Year 3 Amount per hour	Year 3 Number of Hours	Year 3 Total Amount for Year 3
Personnel										
Fleskes, Joseph	$ 5,686.80	$ 45.10	40	$ 1,804.00	$ 47.35	40	$ 1,894.00	$ 49.72	40	$ 1,988.80
Casazza, Michael	$ 4,572.40	$ 36.26	40	$ 1,450.40	$ 38.07	40	$ 1,522.80	$ 39.98	40	$ 1,599.20
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ 10,259.20**			**$ 3,254.40**			**$ 3,416.80**			**$ 3,588.00**
										-
[1/] Benefits as percent of salary	33%			$1,083.72			$1,137.79			$1,194.80
Personnel Total (salary + benefits)	**$13,675.51**			**$4,338.12**			**$4,554.59**			**$4,782.80**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex:Telemetry Vehicle lease & mileage, space rental)	$ 29,700.00			$ 12,000.00			$ 13,000.00			$ 4,700.00
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor(Oregon State University)	$ 279,052.00			$ 103,500.00			$ 103,500.00			$ 72,052.00
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ 308,752.00**			**$ 115,500.00**			**$ 116,500.00**			**$ 76,752.00**
[5/]Overhead Percentage (Applied to Personnel & Other Costs)	7%			$ 8,053.12			$ 8,134.87			$ 5,479.14
Total Costs for Task Two	**$ 344,094.64**			**$ 127,891.24**			**$ 129,189.46**			**$ 87,013.94**

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3/ Please provide a list and cost of major equipment ($5,000 or more) to be purchased, and complete "Equipment Detail" Worksheet

4/ Please list each subcontractor and amounts (if subcontractor not selected yet, use function like "ditch construction subcontractor")

5/ Indicate rate in column immediately to the right of this cell; and provide a description of what expenses are covered by overhead. If overhead is > 15% must provide justification

BUDGET FOR TASK THREE	TOTAL AMOUNT TASK 3 All Years	Year 1 Amount per hour	Year 1 Number of Hours	Year 1 Total Amount for Year 1	Year 2 Amount per hour	Year 2 Number of Hours	Year 2 Total Amount for Year 2	Year 3 Amount per hour	Year 3 Number of Hours	Year 3 Total Amount for Year 3
Personnel										
Fleskes, Joseph	$ 17,060.40	$ 45.10	120	$ 5,412.00	$ 47.35	120	$ 5,682.00	$ 49.72	120	$ 5,966.40
Modeling Statistician-GS11	$ 92,986.40	$ 28.36	1040	$ 29,494.40	$ 29.78	1040	$ 30,971.20	$ 31.27	1040	$ 32,520.80
Data Technician	$ 28,386.80	$ 17.32	520	$ 9,006.40	$ 18.18	520	$ 9,453.60	$ 19.09	520	$ 9,926.80
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$

		$ -			$ -			$ -			$ -	
		$ -			$ -			$ -			$ -	
		$ -			$ -			$ -			$ -	
		$ -			$ -			$ -			$ -	
		$ -			$ -			$ -			$ -	
		$ -			$ -			$ -			$ -	
Personnel Subtotal	**$ 138,433.60**			**$ 43,912.80**			**$ 46,106.80**			**$ 48,414.00**		
[1/] Benefits as percent of salary	33%			$14,622.96			$15,353.56			$16,121.86		
Personnel Total (salary + benefits)	**$184,531.99**			**$58,535.76**			**$61,460.36**			**$64,535.86**		
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**		
Operating Expenses: (software, office supplies, space rental)	$ 11,600.00			$ 4,000.00			$ 4,000.00			$ 3,600.00		
2/ Travel and Per Diem	$ 3,000.00			$ 1,000.00			$ 1,000.00			$ 1,000.00		
3/ Equipment	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
Other Costs Subtotal	**$ 14,600.00**			**$ 5,000.00**			**$ 5,000.00**			**$ 4,600.00**		
[5/]Overhead Percentage (Applied to Personnel & Other Costs)	42%			$ 26,475.35			$ 27,694.03			$ 28,808.91		
Total Costs for Task Three	**$ 282,110.29**			**$ 90,011.11**			**$ 94,154.40**			**$ 97,944.78**		

1/ Indicate your rate, and change formula in column immediately to the right of this cell

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3/ Please provide a list and cost of major equipment ($5,000 or more) to be purchased, and complete "Equipment Detail" Worksheet

4/ Please list each subcontractor and amounts (if subcontractor not selected yet, use function like "ditch construction subcontractor")

5/ Indicate rate in column immediately to the right of this cell; and provide a description of what expenses are covered by overhead. If overhead is > 15% must provide justification

		Year 1			Year 2			Year 3		
BUDGET FOR TASK FOUR	**TOTAL AMOUNT TASK 4 All Years**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 1**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 2**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 3**
Personnel										
Fleskes, Joseph	$ 23,107.20	$ -	0	$ -	$ 47.35	320	$ 15,152.00	$ 49.72	160	$ 7,955.20
Yparraguirre, Daniel (Donated Services)	$ -	$ -		$ -	$ -		$	$ -		$ -
Data Tech	$ 6,108.80	$ -	0	$ -	$ 18.18	0	$ -	$ 19.09	320	$ 6,108.80
Aerial Surveyors	$ 37,814.40	$ -	0	$ -	$ 18.18	2080	$ 37,814.40	$ -	0	$ -
Telemetry Field Techs	$ 26,520.00	$ -		$ -	$ 12.75	2080	$ 26,520.00	$ -		$ -
GIS Specialist	$ 22,401.60	$ -		$ -	$ 15.86	320	$ 5,075.20	$ 16.66	1040	$ 17,326.40
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ 115,952.00**			**$ -**			**$ 84,561.60**			**$ 31,390.40**
[1/] Benefits as percent of salary	33%			$0.00			$28,159.01			$10,453.00

Personnel Total (salary + benefits)	**$154,564.02**			**$0.00**			**$112,720.61**			**$41,843.40**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (Vehicle lease and mileage, bird trapping, telemetry and survey supplies, radiotags, landsat imagery, software, GIS, Aircraft services, space rental, office supplies)	$ 110,800.00			$ -			$ 74,000.00			$ 36,800.00
2/ Travel and Per Diem	$ 5,000.00			$ -			$ 3,000.00			$ 2,000.00
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ 115,800.00**			**$ -**			**$ 77,000.00**			**$ 38,800.00**
5/ Overhead Percentage (Applied to Personnel & Other Costs)	42%			$ -			$ 79,056.58			$ 33,604.11
Total Costs for Task Four	**$ 383,024.70**			**$ -**			**$ 268,777.19**			**$ 114,247.51**

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3/ Please provide a list and cost of major equipment ($5,000 or more) to be purchased, and complete "Equipment Detail" Worksheet

4/ Please list each subcontractor and amounts (if subcontractor not selected yet, use function like "ditch construction subcontractor")

5/ Indicate rate in column immediately to the right of this cell; and provide a description of what expenses are covered by overhead. If overhead is > 15% must provide justification

		Year 1			**Year 2**			**Year 3**		
BUDGET FOR TASK FIVE	**TOTAL AMOUNT TASK 5 All Years**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 1**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 2**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 3**
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
1/ Benefits as percent of salary				$0.00			$0.00			$0.00
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -

4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
5/ Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -
Total Costs for Task Five	**$ -**			**$ -**			**$ -**			**$ -**

1/ Indicate your rate, and change formula in column immediately to the right of this cell

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3/ Please provide a list and cost of major equipment ($5,000 or more) to be purchased, and complete "Equipment Detail" Worksheet

4/ Please list each subcontractor and amounts (if subcontractor not selected yet, use function like "ditch construction subcontractor")

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		Year 1			Year 2			Year 3		
BUDGET FOR TASK SIX	**TOTAL AMOUNT TASK 6 All Years**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 1**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 2**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 3**
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
1/ Benefits as percent of salary				$0.00			$0.00			$0.00
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
5/ Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -

Detailed Budget Breakdown by Task and by Fiscal Year

Total Costs for Task Six	**$ -**			**$ -**			**$ -**			**$ -**

1/ Indicate your rate, and change formula in column immediately to the right of this cell

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4/ Please list each subcontractor and amounts (if subcontractor not selected yet, use function like "ditch construction subcontractor")

5/ Indicate rate in column immediately to the right of this cell; and provide a description of what expenses are covered by overhead. If overhead is > 15% must provide justification

		Year 1			**Year 2**			**Year 3**		
BUDGET FOR TASK SEVEN	**TOTAL AMOUNT TASK 7 All Years**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 1**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 2**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 3**
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
1/ Benefits as percent of salary				$0.00			$0.00			$0.00
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
5/ Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -
Total Costs for Task Seven	**$ -**			**$ -**			**$ -**			**$ -**

1/ Indicate your rate, and change formula in column immediately to the right of this cell

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4/ Please list each subcontractor and amounts (if subcontractor not selected yet, use function like "ditch construction subcontractor")

5/ Indicate rate in column immediately to the right of this cell; and provide a description of what expenses are covered by overhead. If overhead is > 15% must provide justification

Proposal Number
Proposal Name

Detailed Budget Breakdown by Task and by Fiscal Year

Applicant Name

BUDGET FOR TASK EIGHT	TOTAL AMOUNT TASK 8 All Years	Year 1 Amount per hour	Year 1 Number of Hours	Year 1 Total Amount for Year 1	Year 2 Amount per hour	Year 2 Number of Hours	Year 2 Total Amount for Year 2	Year 3 Amount per hour	Year 3 Number of Hours	Year 3 Total Amount for Year 3
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
										-
[1/] Benefits as percent of salary				$0.00			$0.00			$0.00
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
[5/]Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -
Total Costs for Task Eight	**$ -**			**$ -**			**$ -**			**$ -**

1/ Indicate your rate, and change formula in column immediately to the right of this cell

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4/ Please list each subcontractor and amounts (if subcontractor not selected yet, use function like "ditch construction subcontractor")

5/ Indicate rate in column immediately to the right of this cell; and provide a description of what expenses are covered by overhead. If overhead is > 15% must provide justification

BUDGET FOR TASK NINE	TOTAL AMOUNT TASK 9 All Years	Year 1 Amount per hour	Year 1 Number of Hours	Year 1 Total Amount for Year 1	Year 2 Amount per hour	Year 2 Number of Hours	Year 2 Total Amount for Year 2	Year 3 Amount per hour	Year 3 Number of Hours	Year 3 Total Amount for Year 3
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -

-

Proposal Number
Proposal Name

Detailed Budget Breakdown by Task and by Fiscal Year

Applicant Name

	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**		
[1/] Benefits as percent of salary				$0.00			$0.00			$0.00		
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**		
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**		
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -		
2/ Travel and Per Diem	$ -			$ -			$ -			$ -		
3/ Equipment	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**		
[5/]Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -		
Total Costs for Task Nine	**$ -**			**$ -**			**$ -**			**$ -**		

1/ Indicate your rate, and change formula in column immediately to the right of this cell

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		Year 1			Year 2			Year 3		
BUDGET FOR TASK TEN	**TOTAL AMOUNT TASK 10 All Years**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 1**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 2**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 3**
Personnel										
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
	$ -			$ -			$ -			$ -
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
[1/] Benefits as percent of salary				$0.00			$0.00			$0.00

Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
5/ Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -
Total Costs for Task Ten	**$ -**			**$ -**			**$ -**			**$ -**

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		Year 1			Year 2			Year 3		
BUDGET FOR TASK ELEVEN	**TOTAL AMOUNT TASK 11 All Years**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 1**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 2**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 3**
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
1/ Benefits as percent of salary				$0.00			$0.00			$0.00
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -

4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
5/ Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -
Total Costs for Task Eleven	**$ -**			**$ -**			**$ -**			**$ -**

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		Year 1			Year 2			Year 3		
BUDGET FOR TASK TWELVE	**TOTAL AMOUNT TASK 12 All Years**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 1**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 2**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 3**
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
1/ Benefits as percent of salary				$0.00			$0.00			$0.00
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
5/ Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -

Total Costs for Task Twelve	**$ -**			**$ -**			**$ -**			**$ -**

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		Year 1			**Year 2**			**Year 3**		
BUDGET FOR TASK THIRTEEN	**TOTAL AMOUNT TASK 13 All Years**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 1**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 2**	**Amount per hour**	**Number of Hours**	**Total Amount for Year 3**
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
1/ Benefits as percent of salary				$0.00			$0.00			$0.00
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
5/ Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -
Total Costs for Task Thirteen	**$ -**			**$ -**			**$ -**			**$ -**

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Proposal Number
Proposal Name

Detailed Budget Breakdown by Task and by Fiscal Year

Applicant Name

BUDGET FOR TASK FOURTEEN	**TOTAL AMOUNT TASK 14 All Years**	**Year 1** Amount per hour	Number of Hours	Total Amount for Year 1	**Year 2** Amount per hour	Number of Hours	Total Amount for Year 2	**Year 3** Amount per hour	Number of Hours	Total Amount for Year 3
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
[1/] Benefits as percent of salary				$0.00			$0.00			$0.00
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -
2/ Travel and Per Diem	$ -			$ -			$ -			$ -
3/ Equipment	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
4/ Sub-Contractor	$ -			$ -			$ -			$ -
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**
[5/]Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -
Total Costs for Task Fourteen	**$ -**			**$ -**			**$ -**			**$ -**

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BUDGET FOR TASK FIFTEEN	**TOTAL AMOUNT TASK 15 All Years**	**Year 1** Amount per hour	Number of Hours	Total Amount for Year 1	**Year 2** Amount per hour	Number of Hours	Total Amount for Year 2	**Year 3** Amount per hour	Number of Hours	Total Amount for Year 3
Personnel										
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -
	$ -	$ -		$ -	$ -		$ -	$ -		$ -

Proposal Number
Proposal Name

Detailed Budget Breakdown by Task and by Fiscal Year

Applicant Name

	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
	$ -			$ -			$ -			$ -		
Personnel Subtotal	**$ -**			**$ -**			**$ -**			**$ -**		
[1/] Benefits as percent of salary				$0.00			$0.00			$0.00		
Personnel Total (salary + benefits)	**$0.00**			**$0.00**			**$0.00**			**$0.00**		
Other Costs	**Total All Years**			**Total Year 1**			**Total Year 2**			**Total Year 3**		
Operating Expenses: (ex: seed, plant materials, irrigation supplies, software, office supplies, etc)	$ -			$ -			$ -			$ -		
2/ Travel and Per Diem	$ -			$ -			$ -			$ -		
3/ Equipment	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
4/ Sub-Contractor	$ -			$ -			$ -			$ -		
Other Costs Subtotal	**$ -**			**$ -**			**$ -**			**$ -**		
[5/]Overhead Percentage (Applied to Personnel & Other Costs)				$ -			$ -			$ -		
Total Costs for Task Fifteen	**$ -**			**$ -**			**$ -**			**$ -**		

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Proposal Number
Proposal Name

Detailed Breakdown of Equipment Purchase

Applicant Name

EQUIPMENT DETAIL

Use this worksheet as a sample of how to present project equipment costing more than $5,000. Applicants must complete a spreadsheet as shown below to present project equipment costing more than $5,000.

Task No	List of Equipment	Unit Cost	Task Total
1	Computers, printers, plotl	$ -	
2	Rocket netting & other ca	$ -	
3	Telemetry receivers, gps	$ -	
4	Computers, printers, plotl (All USGS donated)	$ -	$ -
		$ -	$ -
		TOTAL	**$ -**

Equipment purchased for a project shall be purchased by (*Name of Contractor*) and shall adhere to State of California Contracting rules and regulations as stated in State Contracting Manual (SCM) 7.29 Equipment Purchases.

For further information please go to: http://www.ols.dgs.ca.gov/Contract+Manual/default.htm

The Contractor shall maintain an inventory record for each piece of non-expendable equipment purchased with the funds provided under the terms of this agreement. The inventory record for each piece of such equipment should include the date acquired, total cost, serial number, model identification, and any other information or description necessary to identify said equipment. Non-expendable equipment are those items of equipment that have a normal life expectancy of one year or more and an approximate cost of $5,000 or more.

Contractor shall provide DFG with a copy of the inventory record at the time an invoice is presented for reimbursement for such equipment purchase.

NOTE: Ownership and reporting requirements for equipment purchased depends upon the Contractor's type of organization (state agency, local entity, private, etc.). Specific provisions for equipment purchases shall be provided at the time contract documents are prepared.

BUDGET OVERHEAD RATE JUSTIFICATION:

USGS-WERC is committed to providing quality science to address complex biological changes at the landscape level. Our strengths are excellence in science, a public service and conservation ethic, leadership in information delivery, a "can do" attitude and a willingness to take a partnership approach. Traditionally we have leveraged our base funds to support partnerships in obtaining reimbursable funds to accomplish the needed science for other public entities and agencies and we will continue to do so. As USGS has moved to a full cost accounting business model however some costs traditionally taken out of science dollars have more appropriately been assigned to indirect costs.

In fiscal year 2003 the U.S. Geological Survey instituted a full project-cost accounting policy. This policy requires all project expenses including direct costs (project related salaries and benefits, travel equipment, etc.) and indirect costs to be budgeted and charged to that project. For reimbursable projects these costs are recovered from customers for whom we perform reimbursable work. At the Western Ecological Research Center the net rate for these indirect costs is 41.67%. Applied to the gross funding for a project, the percentage of costs which are "indirect" is 29.4%. Indirect costs are as much a cost of doing business for USGS as are the direct costs. Indirect costs are those shared costs that are not unique to a particular project and these include USGS Bureau administration costs, common services costs at the headquarters level and facilities costs. USGS or bureau costs include distributed costs for, our contracts, personnel office, budget and finance services and bureau administration and program administration costs among others. Common services costs include the functioning of WERC headquarters administration and management. These costs include a variety of science support and management functions including training, facilities, workers compensation claims, safety, outreach, proposal and product review, publications and information delivery, statistical support, GIS assistance, information technology and security support, purchasing, and agreement processing and billing among many others. USGS is commited to continuing to provide the quality science needed for other agencies and matching science costs where we can for public entities but, given the president's management agenda and the need to pass agency financial audits, USGS must now do so within an appropriate business model. Indirect costs can be reduced on some high priority projects but only by providing congressionally appropriated base funds. As we are in an era of declining appropriations these opportunities are expected to continue to be limited.

USGS-WERC applies a greatly reduced overhead rate (3%) to funds that are passed-through to subcontractors. For this project, this 3% rate applies to those TASK 2 funds that are passed through to Oregon State University (Oregon State University subcontractor funds includes 15% overhead they charge). Because the CALFED budget form only permits listing of a single overhead rate, an overhead rate for TASK 2 was calculated at 6.72%, which provides 3% overhead for pass-through funds and 41.67% for funds retained by USGS.

Environmental Compliance

CEQA Compliance

Which type of CEQA documentation do you anticipate?
X none *Skip the remaining questions in this section.*
− negative declaration or mitigated negative declaration
− EIR
− categorical exemption *A categorical exemption may not be used for a project which may which may cause a substantial adverse change in the significance of a historical resource or result in damage to scenic resources within an officially designated state scenic highway.*

If you are using a categorical exemption, choose all of the applicable classes below.

− Class 1. Operation, repair, maintenance, permitting, leasing, licensing, or minor alteration of existing public or private structures, facilities, mechanical equipment, or topographical features, involving negligible or no expansion of use beyond that existing at the time of the lead agency's determination. The types of "existing facilities" itemized above are not intended to be all−inclusive of the types of projects which might fall within Class 1. The key consideration is whether the project involves negligible or no expansion of an existing use.

− Class 2. Replacement or reconstruction of existing structures and facilities where the new structure will be located on the same site as the structure replaced and will have substantially the same purpose and capacity as the structure replaced.

− Class 3. Construction and location of limited numbers of new, small facilities or structures; installation of small new equipment and facilities in small structures; and the conversion of existing small structures from one use to another where only minor modifications are made in the exterior of the structure. The numbers of structures described in this section are the maximum allowable on any legal parcel, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

− Class 4. Minor public or private alterations in the condition of land, water, and/or vegetation which do not involve removal of healthy, mature, scenic trees except for forestry or agricultural purposes, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

− Class 6. Basic data collection, research, experimental management, and resource evaluation activities which do not result in a serious or major disturbance to an environmental resource, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies. These may be strictly for information gathering purposes, or as part of a study leading to an action which a public agency has not yet approved, adopted, or funded.

− Class 11. Construction, or placement of minor structures accessory to (appurtenant to) existing commercial, industrial, or institutional facilities, except where the project may impact on an environmental resource of hazardous or critical concern where designated, precisely mapped, and officially adopted pursuant to law by federal, state, or local agencies.

Identify the lead agency.

Please write out all words in the agency title other than United States (Use the abbreviation "US".) and California (Use the abbreviation "CA".).

Is the CEQA environmental impact assessment complete?

If the CEQA environmental impact assessment process is complete, provide the following information about the resulting document.

Document Name
State Clearinghouse Number

If the CEQA environmental impact assessment process is not complete, describe the plan for completing draft and/or final CEQA documents.

NEPA Compliance

Which type of NEPA documentation do you anticipate?
X none *Skip the remaining questions in this section.*
− environmental assessment/FONSI
− EIS
− categorical exclusion

Identify the lead agency or agencies.

Please write out all words in the agency title other than United States (Use the abbreviation

"US".) and California (Use the abbreviation "CA".).

If the NEPA environmental impact assessment process is complete, provide the name of the resulting document.

If the NEPA environmental impact assessment process is not complete, describe the plan for completing draft and/or final NEPA documents.

Successful applicants must tier their project's permitting from the CALFED Record of Decision and attachments providing programmatic guidance on complying with the state and federal endangered species acts, the Coastal Zone Management Act, and sections 404 and 401 of the Clean Water Act.

Please indicate what permits or other approvals may be required for the activities contained in your proposal and also which have already been obtained. Please check all that apply. If a permit is *not* required, leave both Required? and Obtained? check boxes blank.

Local Permits And Approvals	Required?	Obtained?	Permit Number (If Applicable)
conditional Use Permit	–	–	
variance	–	–	
Subdivision Map Act	–	–	
grading Permit	–	–	
general Plan Amendment	–	–	
specific Plan Approval	–	–	
rezone	–	–	
Williamson Act Contract Cancellation	–	–	
other	–	–	

State Permits And Approvals	Required?	Obtained?	Permit Number (If Applicable)
scientific Collecting Permit	–	–	
CESA Compliance: 2081	–	–	

CESA Complance: NCCP	–	–	
Lake Or Streambed Alteration Agreement	–	–	
CWA 401 Certification	–	–	
Bay Conservation And Development Commission Permit	–	–	
reclamation Board Approval	–	–	
Delta Protection Commission Notification	–	–	
state Lands Commission Lease Or Permit	–	–	
action Specific Implementation Plan	–	–	
SWRCB Water Transfer Approval	–	–	
other	–	–	

Federal Permits And Approvals	Required?	Obtained?	Permit Number (If Applicable)
ESA Compliance Section 7 Consultation	–	–	
ESA Compliance Section 10 Permit	–	–	
Rivers And Harbors Act	–	–	
CWA 404	–	–	
other	–	–	

Permission To Access Property	Required?	Obtained?	Permit Number (If Applicable)
permission To Access City, County Or Other Local Agency Land Agency Name	–	–	
permission To Access State Land Agency Name	–	–	
permission To Access Federal Land Agency Name	–	–	
permission To Access Private Land Landowner Name	–	–	

If you have comments about any of these questions, enter them here.

Land Use

Does the project involve land acquisition, either in fee or through easements?
X No. *Skip to the next set of questions.*
– Yes. *Answer the following questions.*

How many acres will be acquired by fee?

How many acres will be acquired by easement?

Describe the entity or organization that will manage the property and project activities, including operation and maintenance.

Is there an existing plan describing how the land and water will be managed?
– No.
– Yes. *Cite the title and author or describe briefly.*

Will the applicant require access across to or through public or private property that the applicant does not own to accomplish the activities in the proposal?
– No. *Skip to the next set of questions.*
X Yes. *Answer the following question.*

Describe briefly the provisions made to secure this access.

Access will be required to capture waterbirds for radiotagging and recover radiotagged waterbirds that die during the study (all tracking can be conducted from public roads). Trapping will be conducted on National Wildlife Refuges or State Wildlife Areas. Managers of these areas will be contacted to request permission. We have a good working relationship with these managers through past work and anticipate receiving required permission. Landowners will be contacted on a case–by–case basis to gain access to recover dead radiotagged waterbirds. Past experience indicates nearly all are willing to allow us access.

Do the actions in the proposal involve physical changes in the current land use?
X No. *Skip to the next set of questions.*
– Yes. *Answer the following questions.*

Describe the current zoning, including the zoning designation and the principal permitted uses permitted in the zone.

Describe the general plan land use element designation, including the purpose and uses allowed in the designation.

Describe relevant provisions in other general plan elements affecting the site, if any.

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?
X No. *Skip to the next set of questions.*
– Yes. *Answer the following questions.*

Land Designation	Acres	Currently In Production?
Prime Farmland		**–**
Farmland Of Statewide Importance		**–**
Unique Farmland		**–**
Farmland Of Local Importance		**–**

Is the land affected by the project currently in an agricultural preserve established under the Williamson Act?
X No. *Skip to the next set of questions.*
– Yes. *Answer the following question.*

Is the land affected by the project currently under a Williamson Act contract?
X No. *Skip to the next set of questions.*
– Yes. *Answer the following question.*

Why is the land use proposed consistent with the contract's terms?

Describe any additional comments you have about the projects land use.

This project evaluates, but does not impact, land use.