Summary Information

River Partners

Assessment of vegetative and wildlife responses to innovative restoration design on the beehive bend unit

Amount sought: $364,156

Duration: 36 months

Lead investigator: Mr. Dan Efseaff, River Partners

Short Description

This project will monitor the restoration responses of project ERP−97N03B (the Dept of Fish and Game's "Sacramento River Floodplain Acquisition − Riparian Forest Restoration"). This project will lead a collaborative effort to examine the responses of wildlife and vegetation to the restoration project and test some of the underlying assumptions that went into the project design on the Beehive Bend Unit.

Executive Summary

In March 1999, the California State Wildlife Conservation Board (WCB) and the Department of Fish and Game signed an agreement with Sacramento River Partners to restore native vegetation on the Thomas and Beehive Bend Units (Sacramento River Miles 169.5 R and 166.5 R). The project intended to enhance wildlife habitat, reduce the dominance of non−native plants, and work with the local community in the restoration process on state−owned land. The project was funded under 97N03B (the Dept of Fish and Game's "Sacramento River Floodplain Acquisition − Riparian Forest Restoration").

River Partner’s initiated a new and innovative horticultural restoration on these sites based directly on guidelines from the Riparian Bird Conservation Plan (RHJV 2000). River Partners staff maintained frequent consultation with PRBO biologists in the implementation of these recommendations. Results from PRBO bird count surveys from the past 3 years have show strong initial response in both abundance and diversity (Rogner et al 2004 and Gardali et al. 2004) by the riparian bird community. Long−term survival of the riparian bird community however remains at risk (in question) with extremely high rates of nest predation demonstrated on other sites in the Central Valley (Geupel et al 1997. Small et al. 1999, Haff 2003). There is concern that some sites may be creating population sinks.

River Partners requests $370,265 to lead a collaborative effort to examine the responses of wildlife and vegetation to the restoration project and test some of the underlying assumptions that went into the project design on the Beehive Bend Unit. Specifically, this project will:

• Provide a comprehensive look at annual variations in bird usage, quantify the contribution of the restoration as a population source or sink, and compare to reference sites,

• Quantify plant succession and vegetative structure. We will resample and analyze six permanent plots established during implementation. This information complements the examination of the bird response, allows an opportunity to test key assumptions of the plant design, and documents successional and structural changes. We will also evaluate remote sensing methods through comparison with the on−the−ground measurements.

• Compare rodent numbers between the restoration and other land uses. Rodent herbivory has been implicated as a cause of mortality in naturally recruited cottonwoods, and is of concern to agricultural interests.

Taken together, this information will provide a comprehensive evaluation of the wildlife−oriented design approach and the response of wildlife to improve our understanding of the system and improve future implementation strategies.

PROPOSAL

Assessment of Vegetative and Wildlife Responses to Innovative Restoration Design on the Beehive Bend Unit.

Sacramento River Wildlife Area
Sacramento River Mile 169.5 R and 166.5 R
Glenn County, California

November 19, 2004

Submitted to:

CALFED BAY-DELTA PROGRAM

California Bay Delta Program
Monitoring and Evaluation Proposal

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ASSESSMENT OF VEGETATIVE AND WILDLIFE RESPONSES TO INNOVATIVE RESTORATION DESIGN ON THE BEEHIVE BEND UNIT. GLENN COUNTY, CALIFORNIA

I. PROPOSAL SUBMISSION

A. Project Description

In March 1999, the California State Wildlife Conservation Board (WCB) and the Department of Fish and Game signed an agreement with Sacramento River Partners to restore native vegetation on the Thomas and Beehive Bend Units (Sacramento River Miles 169.5 R and 166.5 R). The project intended to enhance wildlife habitat, reduce the dominance of non-native plants, and work with the local community in the restoration process on state-owned land. The project was funded under 97N03B (the Dept of Fish and Game's "Sacramento River Floodplain Acquisition - Riparian Forest Restoration").

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Figure 1. Vicinty map Beehive Bend

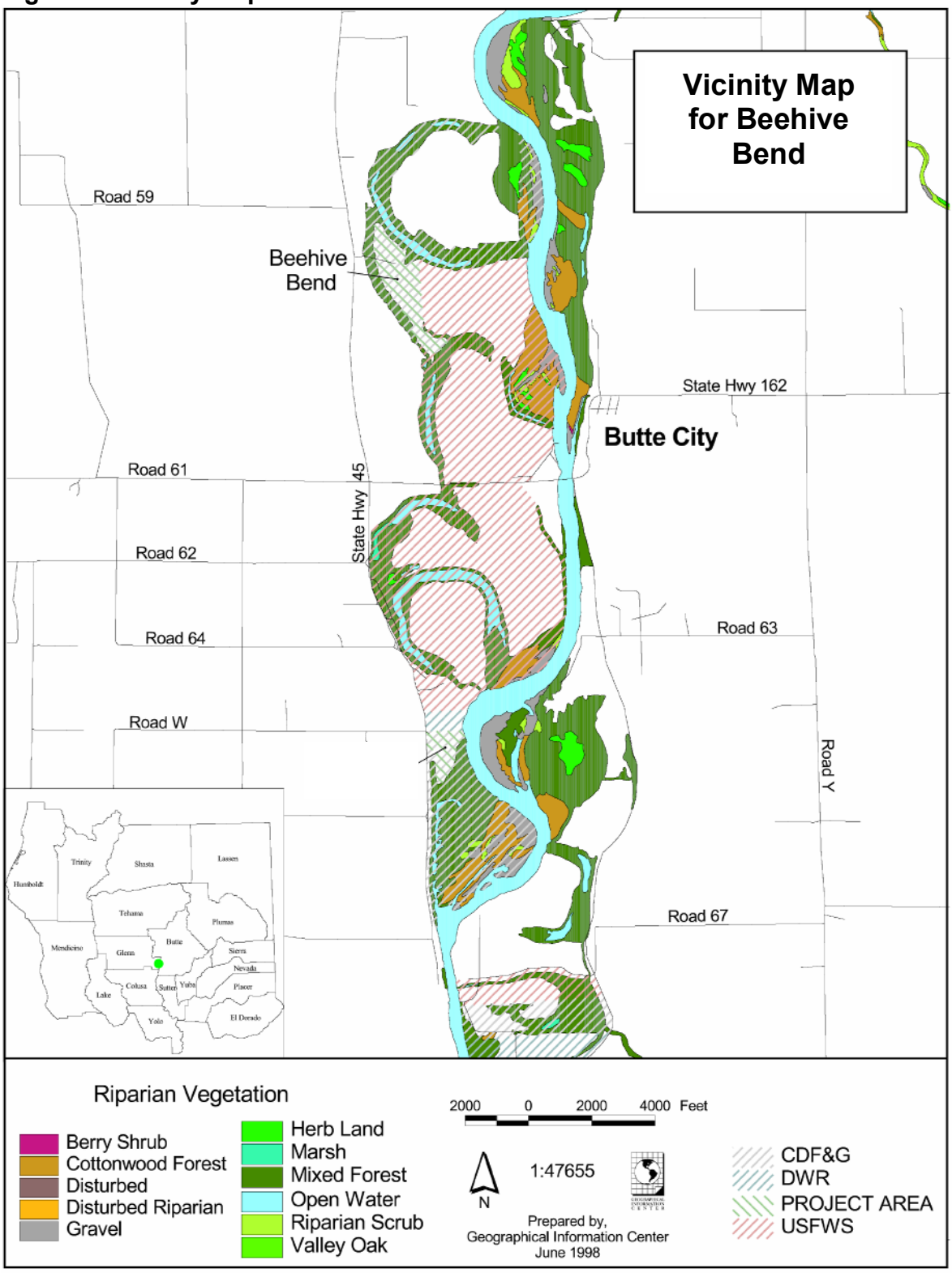
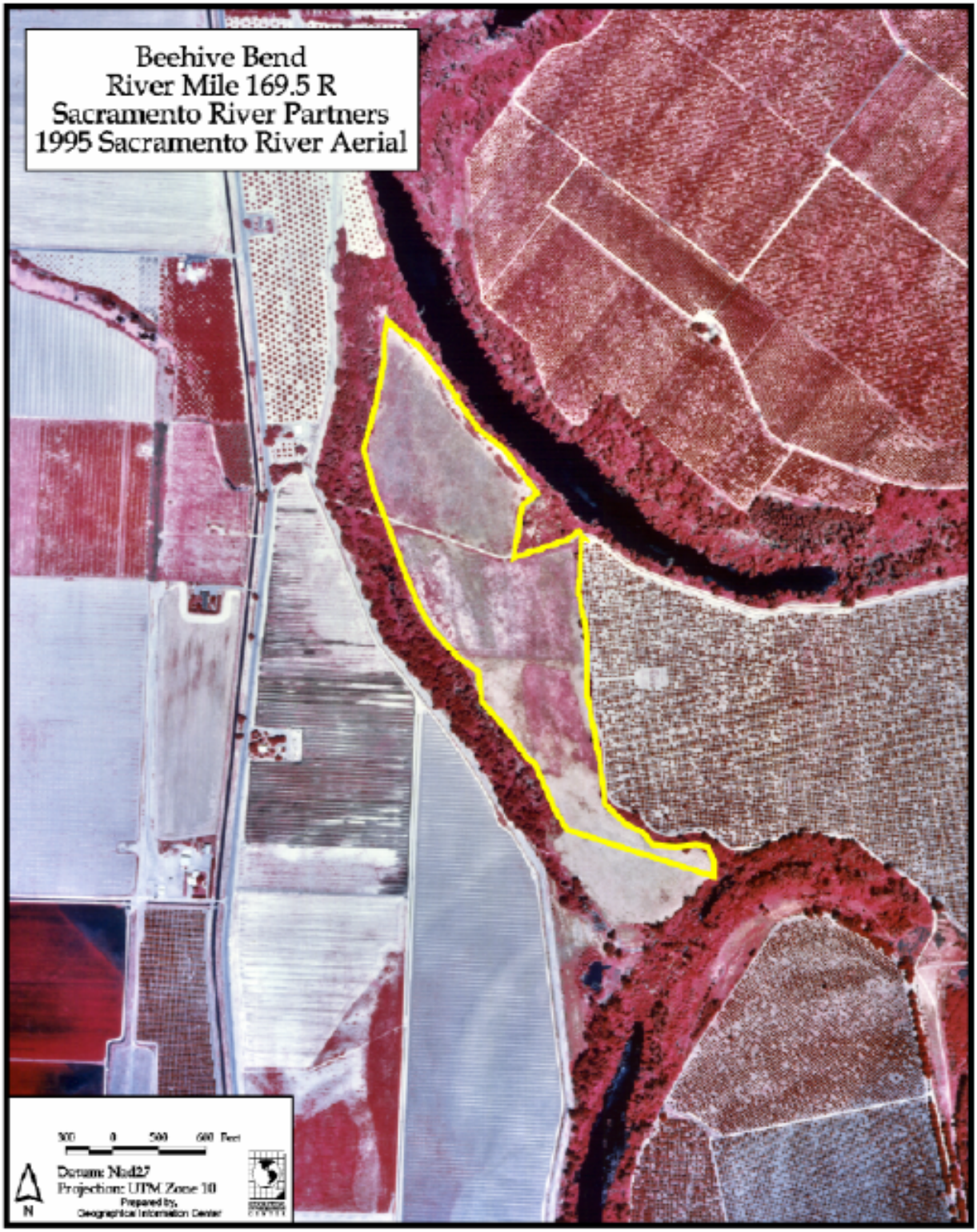


Figure 2. Beehive Bend Location Map.



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Taken together, this information will provide a comprehensive evaluation of the wildlife-oriented design approach and the response of wildlife to improve our understanding of the system and improve future implementation strategies.

1. Problem, Goals, and Objectives

We have selected the Beehive Bend site to follow-up on initial monitoring (permanent vegetation plots, avain point counts) but also add a couple of twists (compare remote sensing methods, avain nest surveys, rodent trapping, and compare local land uses).

a) Problem

We have selected a relatively small number of problem statements to examine for this monitoring proposal.

- An important assumption of ecological restoration is that it provides appropriate habitat and conditions for native species. Unfortunately, restoration projects are often designed with little consideration for their effects on wildlife (Block et al. 2001). Others are developed specifically to provide habitat for a single imperiled species (Kus 1998). Horticultural restoration of Beehive, however, largely followed recommendations from the Riparian Bird Conservation Plan (RHJV 2000) as well as from direct consultation with PRBO biologists. This represents a novel approach to restoration as it not only focused on creating the riparian plant community but also used the habitat requirements of a diverse community of songbirds to aid in the design of the restoration (e.g., planting palette and configuration). Bird usage on the Beehive Bend Unit has increased dramatically.

  But does this point to increases in bird populations? Are these sites potential populations sinks? Is the increased bird use associated with habitat features (such as vegetative structure) developed on the site or does it represent larger landscape related features? Has bird usage continued to increase after restoration? Is there a shift in species?

- In addition to providing the necessary habitat features for wildlife, restoration plantings are often cited as a means to “jump start” native plant succession by providing seed sources and safe sites. However, reliable documentation is often lacking. During implementation 6 permanent plots were established at Beehive Bend (we also collected visual plot estimates of understory species), which provide a unique opportunity to thoroughly evaluate plant succession and structural changes.

  Has the restoration planting increased the recruitment of native plants? What is the change in vegetative structure and composition? Does plant survivorship match conventional assumptions? How effective are remote sensing methods to assess vegetative changes? Are there any mortality patterns on site that suggests the effectiveness of the restoration design?

- Some agricultural interests cite potential negative impacts to nearby landowners from conservation activities. One concern is that restoration sites may harbor high levels of rodents that in turn may damage crops. The Beehive Bend Unit is uniquely situated with existing riparian, fallow agricultural fields, and restoration sites all within close proximity. A scientifically sound comparison will examine the assumptions pertaining to vertebrate pest problems, and provide insight into possible management solutions.

  What are the differences in rodent numbers and species between land use types? Can this knowledge point to design strategies that address landowner concerns? Can we document mortality on riparian plants due to the actions of rodents?

b) Goals and Objectives

The goals and objectives for the project are provided in Table 1. The project is oriented toward testing the assumptions used to implement the restoration (especially the wildlife oriented design).

Table 1. Summary of project goals and objectives for monitoring on the Beehive Bend Unit, Glenn County, California.

Project Goals and Objectives
• Use monitoring to evaluate the management hypotheses and assumptions used in the restoration design.
• Estimate bird species composition, abundance and reproductive success on restoration plots and remnant plots.
• Determine the local and landscape level characteristics that influence bird abundance and reproductive success.
• Document successional and structural changes in the restoration area since the end of the project.
• Examine the advantages and disadvantages of using remote sensing to evaluate cover, structure, and survivorship of the restoration project.
• Compare rodent populations between existing riparian, restored riparian, fallow agricultural, and active agricultural areas.

2. Justification

The Beehive Bend restoration is one of the first restoration projects in which specific habitat features were built into the design to attract wildlife. The baseline data and assumptions stated in the plan provides a well-documented case on which to examine some of the basic assumptions and management hypotheses used to design and implement riparian restoration projects.

The text below lays out the basic conceptual model used for similar projects, discuss some of the specific habitat features built into the project and lay out the initial ecosystem responses.

PROPOSAL

a) Conceptual model

Our conceptual model summarizes some of the assumptions used to implement the restoration and draws out the salient questions that are addressed by this proposal.

(1) Rationale for restoration

Agriculture on the Beehive Bend Unit ceased in the late 1980's (due to frequent and severe flooding) and the site was added to the Sacramento River Wildlife Area. The state purchased the sites in the early 1990's (mainly for areas of existing riparian forest) and added them to the Sacramento River Wildlife Area. Active restoration was prescribed, because even after nearly a decade with several flood events and ample seed sources, non-native plant species dominated the site, providing extremely poor wildlife habitat. Without intervention, these undesirable conditions would have continued, perhaps for decades.

We have observed similar conditions on other sites. Areas that are exposed sufficiently to physical processes (flooding, sedimentation, erosion, etc.), typically allow native plant recruitment and require little intervention. However, as we move away from the main channel, especially under modified hydrographs, biological factors become more important (Johnson *et al.* 1995). Biological factors include:

- Competition (sunlight and moisture competition from non-native species) (Adams *et al.* 1992; Danielson and Halvorson 1991),
- Rodent predation of seeds and girdling of young trees (Griffin 1980; Knudsen 1984), and
- Browse pressure from herbivores (insects, rabbits, and deer) (Griffin 1971).

Without intervention, undesirable non-native plants are likely to dominate, leaving the site devoid of native vegetation (and desirable wildlife habitat) for decades. These conditions also favor rodents (Chouinard *et al.* 1999), which, in turn, can girdle young trees or consume seeds and acorns.

To remedy these issues, we planted over 12,000 native plants typical of a mixed riparian forest on the Beehive Unit, based on elevation, proximity to the river, surrounding vegetation, flooding frequency, hydraulic considerations, and soil type. Native grass complements the woody species on the Beehive Bend Unit and minimizes the invasion of non-native species, enhances habitat, limits erosion, and decreases the potential of damaging fires.

(2) The focus on wildlife

Fifteen years ago, initial restoration projects on the Sacramento River demonstrated the feasibility of implementation. Today, as our understanding has increased, restoration projects have become more sophisticated to meet multiple goals. Physical and biological features certainly influence long-term survivorship and the selection of vegetation. However, current plant designs do not simply match plants to site conditions. Restoration plans must consider wildlife requirements, neighboring land use, public access, and long-term management practices (Figure 3). Project implementation must be conducted within an adaptive management framework.

Features for wildlife have become one of the most important features in these designs. Working with partners, such as PRBO Conservation Science, River Partners develops specific design features to attract targeted wildlife species on nearly 3,000 acres of California Department of Fish and Game, US Fish and Wildlife Service, and private lands. Aided with the help of the California Wildlife Habitat Relations database and PRBO recommendations (Figure 4), site-specific monitoring information, and other information sources, we develop specific designs with testable hypotheses.

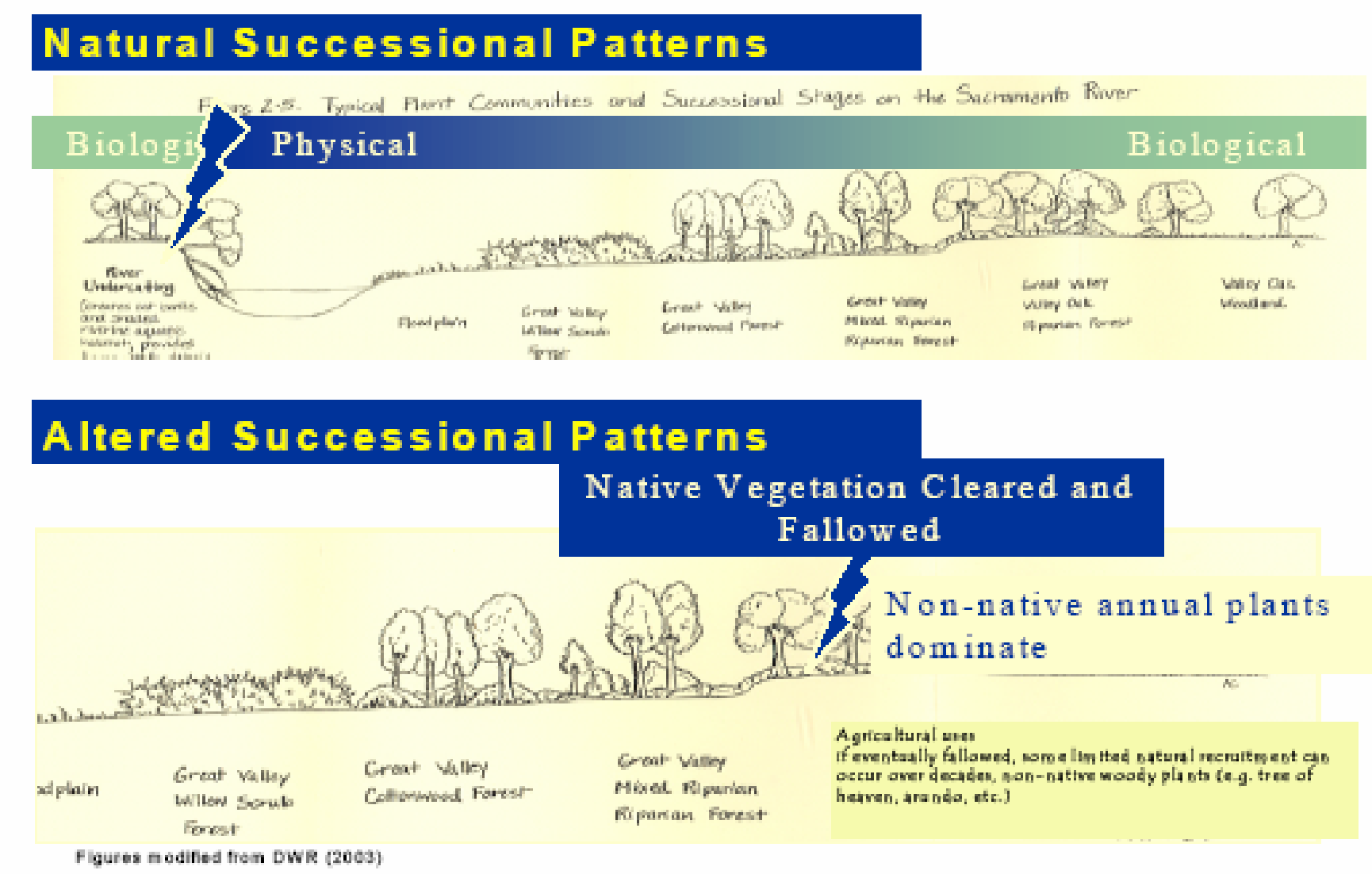
(3) Beehive Bend Widlife Features

In 1999, River Partners initiated an innovative approach to the plant design for the Beehive Bend Unit by incorporating specific guidelines from the Riparian Bird Conservation Plan (RHJV 2000). The implementation of these recommendations over three years were closely followed by restoration practitioners in almost weekly consultation with PRBO biologists. Some of the features include:

- The planting contained a high plant diversity: 20 different plant species representing native grasses, vines, shrubs, trees were incorporated into the planting.
- Vegetation structure is an important component: Plants were arranged to develop habitat features (for example grouping trees to create dense groves for western yellow-billed cuckoos, or grouping small shrubs together to mimic a large shrub, for cover-dependent wildlife).
- Conventional ecological theory holds that high plant species diversity and structural diversity, translates to high wildlife diversity. Thus, alternative vegetation series (shrub clusters) were embedded into the design.
- We opted to plant “two forests” on site. Although much of the site in the long term (>25-80 years) will sustain oak woodland or savanna, we also planted fast growing, short lived plants (e.g. cottonwood and willows) to provide maximum structure for several generations of targeted bird species with nesting and foraging habitat, and other important habitat features such as cavities and snags. Planting both forests maximizes quality habitat as the slow growing, but shade tolerant oaks mature.
- The site was developed to provide a mosaic design with dense shrub patches interspersed with trees to achieve a semi-open canopy (clump similar vegetation). Furthermore, 5 different plant communities were selected to provide a mosaic of vegetation to provide shrub clusters and better match site conditions.
- Temporary service roads to minimize habitat fragmentation and maximize connectivity between existing patches of riparian habitat.
- Curved planting rows to maintain economies of scale, but provide a vegetation screen for wildlife from the busy farm road that bisects the site.

More recent designs (Figure 5) have continued to add detailed design considerations to meet multiple objectives.

Figure 3. Comparison of Natural and Altered (land clearing, weed competition, hydrologic regime, etc.) Succession Patterns.



Figures modified from DWR (2003)

Figure 4. Birds respond to particular habitat features over the landscape.

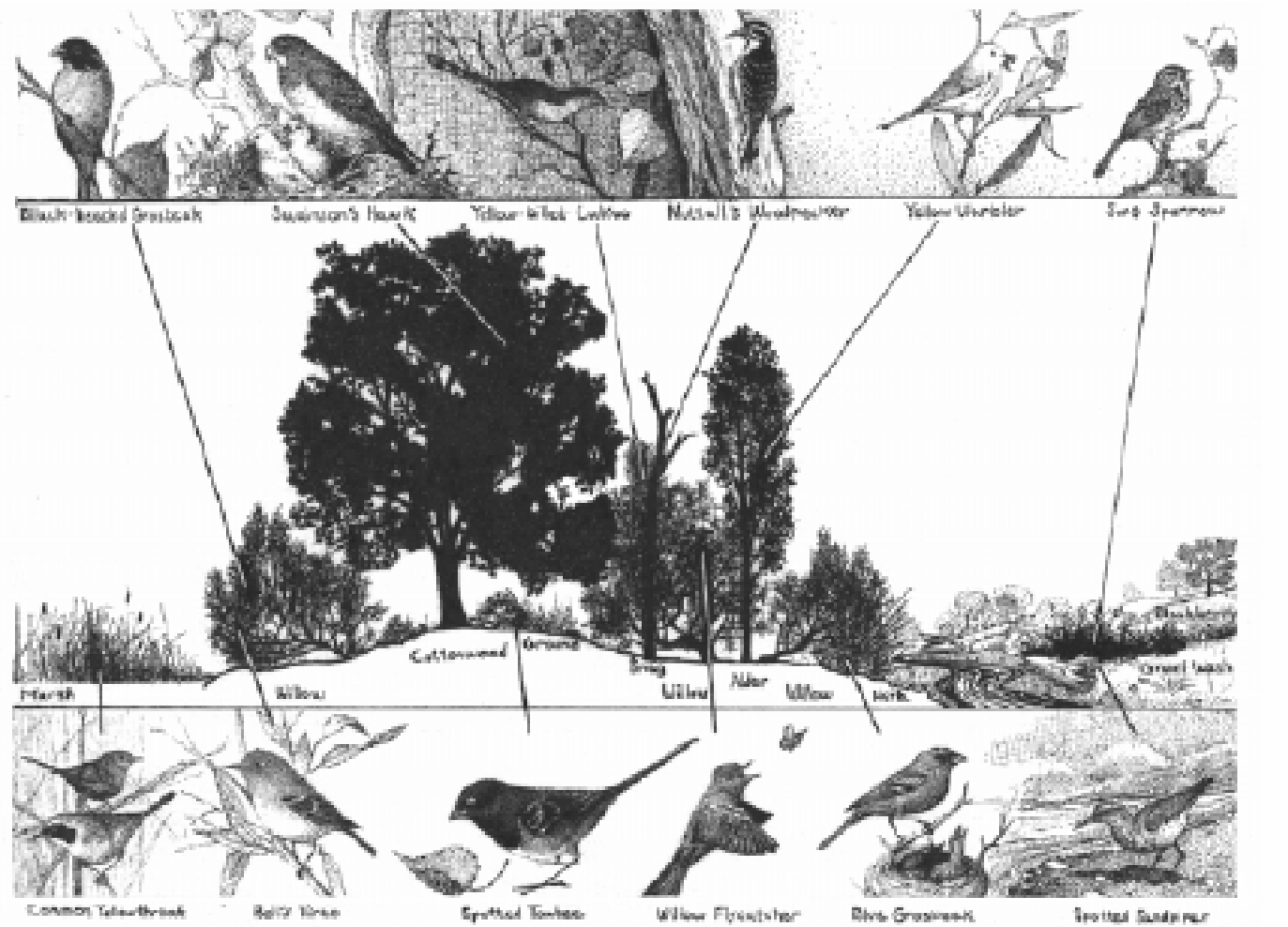
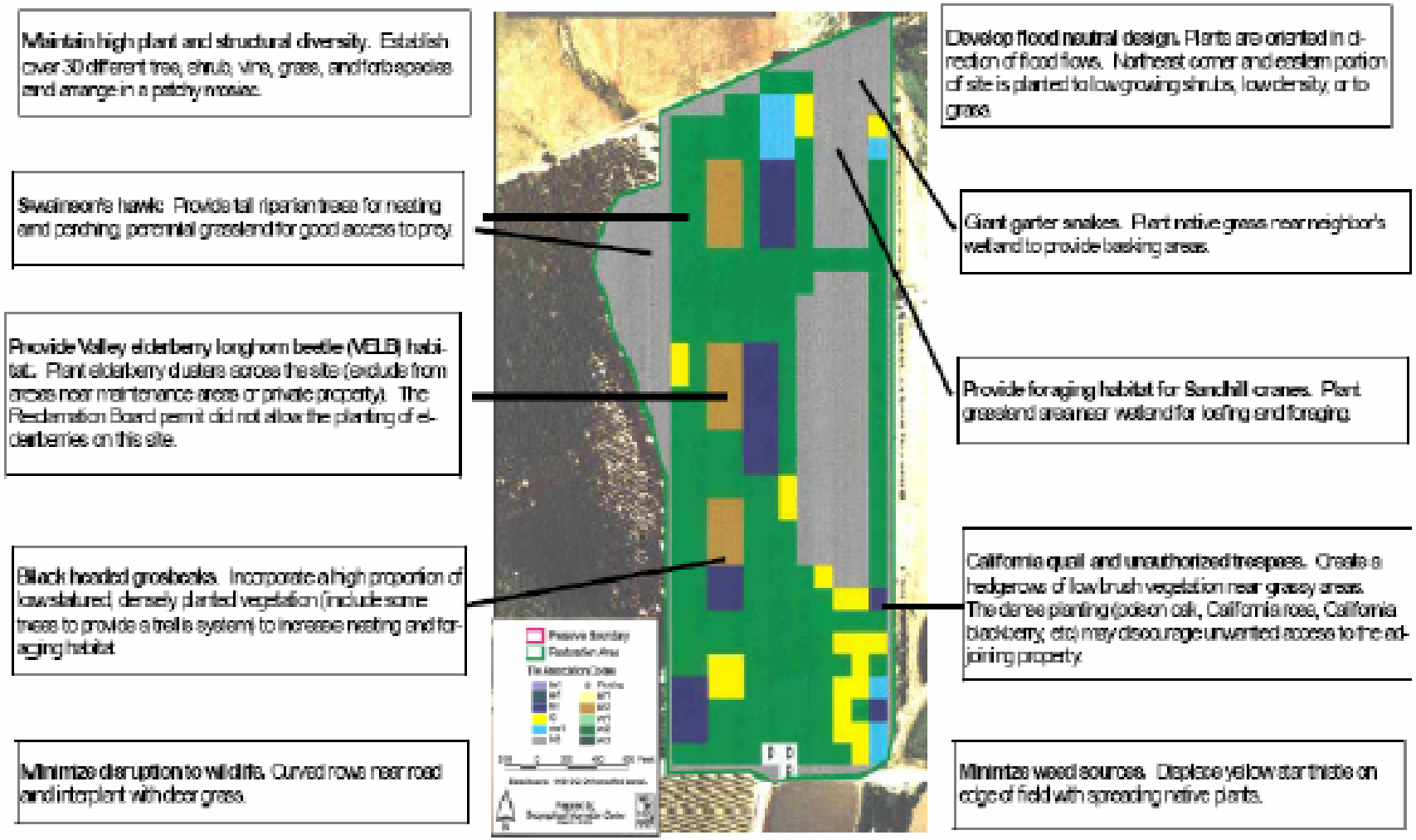


Figure 5-1. A healthy system needs diverse vegetative structure to best support birds. Illustration by Zac Denning.

Figure 5. Examples of more recent wildlife designs, Del Rio Wildland Preserve, Glenn County, California.



(4) Ecosystem Responses

Birds have been surveyed at Beehive from 1999 to 2003 and results from 2000 to 2003 indicate that bird species richness and diversity are increasing as the restoration has matured (Table 2 and Figure 6). However, it is unclear if bird diversity or even abundance equates to population viability. An alternative view is that restored habitats may act as ecological traps. Ecological traps occur when organisms are attracted to an area based on environmental cues (e.g., habitat type and structure) that are decoupled from actual suitability or quality. In such cases, organisms can become "trapped" by their evolutionary responses to the cues and experience reduced survival or reproduction (Schlaepfer et al. 2002). Hence, we propose to study reproductive success to determine habitat quality of restored and remnant areas at Beehive and to evaluate the relationship between bird abundance and reproductive success. Information on abundance and reproductive success will provide a robust evaluation of restoration performance for birds.

Our monitoring efforts will also evaluate some other responses that were not feasible to assess during the implementation:

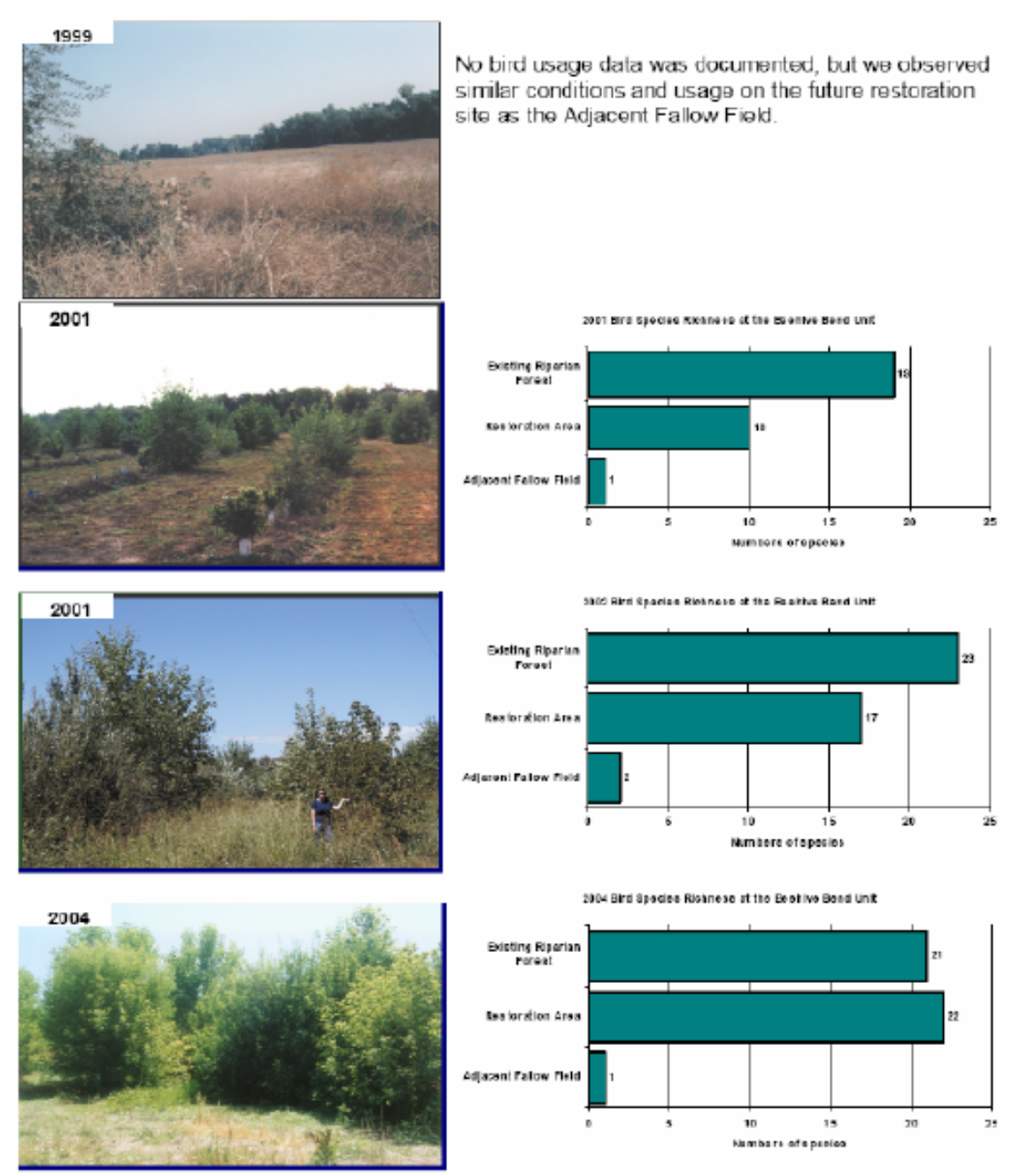
- An increase in native plant recruitment as the dominance of non-native plants were broken,
- A decrease in rodent populations,
- A continued increase in bird usage as the vegetation structure of the site became more complex.

These and other predictions provide testable statements and are a focus of this proposal.

Table 2. Summary of Pre and End of project vegetation conditions on the Beehive Bend Unit.

Factor	Pre-project conditions (1999)	End of project conditions (2002)
Native WoodyPlant Density (plants/acre)	5.5	>250 (survivorship > 75%, native plant recruitment adds 42 plants/acre)
Growth form	Most plants < 1m , clumps of widely spaced re-sprouted prune trees are the dominant woody vegetation	Some trees > 7 m (25 ft) tall, some shrubs > 3 m wide (9 feet)
Estimated Native Cover	<5%	>31% (native grass cover will add an additional 10%).
Weed pressure	Site dominated by Johnson grass, yellow star thistle, and black mustard.	Native grass 10% relative cover (year 1). Should increase over time. Area occupied by invasive weeds is greatly reduced.

Figure 6. Observed bird usage and changes in vegetation structure at the Beehive Bend Unit, Glenn County, California.



Species found on the restored Beehive Bend Unit (2004) include: American goldfinch, American robin, Ash-throated flycatcher, Barn swallow, Black-chinned hummingbird, Bewick's wren, Brown-headed cowbird, Black phoebe, Bullock's oriole, Bushtit, California towhee, California quail, Common yellowthroat, Downy woodpecker, House finch, Lazuli bunting, Lesser goldfinch, Mourning dove, Nuttall's woodpecker, Spotted towhee, Western kingbird, and Western Scrub-jay.

b) Hypotheses

The project is guided by the following working alternative hypotheses:

- Bird usage represents and nesting success represents a source for bird populations.
- Restoration conditions have allowed for native plant succession.
- Restoration and existing riparian land cover negatively impacts rodent populations in comparison to fallow areas.
- Remote sensing can be combined with on-the ground measurements to provide an accurate characterization of a site's habitat features.

3. Previously Funded Monitoring

Previous funding allowed for the following monitoring activities on site:

- Regular field monitoring of irrigation needs, weed pressure, deer and rodent herbivory, and the effectiveness of field operations.
- Census and sampling of planted woody species, including establishment of 6 permanent plots,
- Visual estimation of cover,
- Establishment of photopoints, and
- Avian point count surveys.

The results of the third year provided an enticing view of the success of the approach (Figure 6). We did not have pre-project bird data, but site conditions and observations suggest that species richness would be entirely similar to the observations made on the fallow field. We did collect pre-project vegetation data (SRP 2002). We reviewed all monitoring data, neighbor concerns, and projection implementation thoroughly at End of Season meetings.

4. Approach and Scope of Work

This monitoring proposal builds on the past work on the site to evaluate the wildlife response and effectiveness of the Beehive Bend restoration. We propose a collaborative effort to complete the following tasks:

- Task 1: Administer project management,
- Task 2: Develop a monitoring plan,
- Task 3: Evaluate bird response to restoration practices,
- Task 4: Evaluate vegetation structure and composition,
- Task 5: Compare rodent populations between the restoration and other land uses, and
- Task 6: Produce a final report.

Tasks are discussed in detail below.

PROPOSAL

a) Task 1: Administer project management

As the lead, River Partners will administer project funding, monitor project progress, oversee subcontractor services, and communicate regularly to CALFED. River Partners will provide progress reports, invoices, and scheduled deliverables. This project is likely to require a considerable amount of coordination.

b) Task 2: Develop a monitoring plan

To maximize the coordination and integration of the various efforts, we will work with our partners to write a detailed monitoring plan. The monitoring plan will describe how monitoring efforts will be coordinated to get a more complete picture from the monitoring (for example, vegetation surveys may overlap with bird survey points). The plan will also indicate how the project may be integrated with other complimentary CALFED monitoring efforts.

c) Task 3: Evaluate bird response to restoration practices

We propose to study reproductive success to determine habitat quality of restored and remnant areas at Beehive and to evaluate the relationship between bird abundance and reproductive success. This effort builds on previous work carried out by PRBO between 1999 and 2003. These data and analyses will provide insight into the performance of horticultural restoration to provide quality breeding habitat for birds. This objective will aid in interpreting bird response to horticultural restoration as well as inform future restoration investments.

We will survey birds using the point count method (see below) at three sites; Beehive, Princeton, and Jacinto. Each site has previously been surveyed by PRBO and each site contains both remnant and revegetated survey plots. At two sites, Behive and Jacinto, we will establish nest-monitoring plots (see below). Each will have two plots: one in restored forest and one in remnant forest. Princeton and Jacinto were restored with similar designs as the Beehive Bend Unit, and will allow us to tease out landscape level patterns.

(1) Point Count Surveys

We will use the point count method (Ralph et al. 1993, 1995) to monitor the abundance and community composition of birds. This method is used to monitor population changes of breeding landbirds over time and is the standard for obtaining information on the diversity and richness of birds in a given area. In this method, skilled observers record all birds detected within 50 m of each sampling station during 5 minutes of observation, and counts will be repeated two times per year. The point count method is a standardized and widely applied census method that also contains a vegetation assessment component—a relevé (Ralph et al. 1993). The vegetation assessment component can be used to relate changes in bird composition and abundance to temporal (e.g., restoration) or inter-site differences in vegetation.

(2) Nest Monitoring

We will use nest monitoring to measure reproductive success (Martin and Geupel 1993). This intensive field method will be conducted throughout the breeding season (approximately April through July) and focus on a few key species. Nest monitoring measures breeding productivity, including such important components of individual fitness as nesting success, clutch size and the number of young fledged. Nest vegetation assessment will also be collected at each site where a nest is found and monitored, as well as at randomly-chosen locations within the same area, in order to identify habitat influences on breeding productivity and nest site selection.

(3) Territory Mapping

We will estimate the density of breeding birds using the territory mapping method (IBCC 1970) at each nest monitoring plot. The territory mapping method is based on mapping the territorial behavior of birds. By marking the locations of birds on a detailed map throughout the breeding season, it is possible to count the number of territories in an area and estimate the density of birds.

d) Task 4: Evaluate vegetation structure and composition

A great deal of the bird response is related to the increasing structural complexity that the restoration provides. The vegetation sampling provides a basis of comparison to quantify habitat changes and allows us to examine some of the basic assumptions that went into the design. We plan to conduct follow-up samples that parallel the original sampling, and some key monitoring activities to assess the design assumptions (assessment of mortality causes). To document changes (and demonstrate potential application to individual project sites), we plan to integrate this information with remote sensing methods and Global Positioning System (GPS) technology to provide an accurate view of the changes on-site.

The project contained a number of features that will aid data collection.

- To translate the design from map to field, the entire restoration area was divided into many smaller planting units (a 5 row by 10-plant area, referred to as a “tile”). Vegetation was assigned for each area of the site and every planting location was assigned a plant species and entered into a database and labeling system. The database system allowed for a complete census of plant survivorship in the field. Although some changes and errors may not have been captured by this system, we have extraordinary knowledge of what was originally planted and survivorship by location.
- In addition, we established six 20 by 50 meter permanent plots on the Beehive Bend restoration (SRP 2002). The plots allowed for a sampling of survivorship, cover and vigor.
- Pre-project transects documented native woody species on the project area.
- Visual estimates of cover in 1x 1m plots were collected to assess the native grass planting.
- Extensive documentation of the project was collected (some of which are listed in Table 2).

Table 2. Summary of Data Collection Methods for River Partner Projects (SRP 2003).

Phase	Method	Staff	Timing	Metric/Product	Target
Planning	Photo-points	Biology staff	Beginning of and at regular intervals during project	Photo-point locations, photos	Compare changes over time due to project activities.
	Qualitative site summary	Biology staff	Beginning of project	Ranking of dominant plant species, site observations	Document pre-project conditions, provide plant design information
	Soil log	Biology staff	Beginning of project	Soil characteristics	Provide plant design information
Implementation	Planting report	Field manager	After each planting or replanting event	Plant numbers, effort estimate, note areas for improvement	Document activities for client and billing, evaluate procedures, improve future tasks.
	Monthly log	Field manager	Monthly during growing season	Document field activities and observations	Document activities for billing, evaluate effectiveness, vehicle for communication.
	Neighbor and client survey	Field manager	Annually (summer)	Document responses	Anticipate management issues, improve responses to neighbor concerns.
	Outreach log	Biology staff and Field managers	After each event (optional)	Document outreach contact	Educate community, document for funders.
	Site visit with staff or outside experts	Field managers	Approximately every 2 months	Gain feedback on management techniques and field conditions	Improve techniques and timing of field operations, train staff.
Monitoring	Plant census	Biology staff	End of first growing season	Plant survivorship by species and patterns	Document survivorship, determine patterns that may alter plant design or management.
	Permanent plot sampling	Biology staff	Second and third growing season (spring through fall)	Plant survivorship, height, and cover.	Checks survivorship through less intensive means, measures vigor, collects baseline data for future research.
	Native grass	Biology staff	Annually after planting (spring)	Visual estimates	Provides a rapid, systematic, semi-quantitative measure of relative cover.
	Various wildlife monitoring	Biology staff Contractors	Various	Various- Bird usage, VELB presence, etc.	Document response of wildlife to restoration.
Evaluation	Client meeting	Biology staff and field managers	Annually (late summer or early fall)	Project feedback, update objectives.	Address management issues, respond to new information, communicate with clients.
	End of Season Review	All	Annually (late summer or early fall)	Analysis of monitoring data, review management techniques, management recommendations.	Complete adaptive management cycle, adapt management recommendations based on field observations, monitoring data, and budget constraints, improve future project performance, develop replant recommendations.

Phase	Method	Staff	Timing	Metric/Product	Target
Reporting	End of Season Report or Memo	Biology staff	Annually (fall or early winter)	Document project activites, data, and responses.	Communicate to staff and clients.
	Prepare articles or presentations	Various	As appropriate	Publish or present information	Enhance understanding of restoration and river ecology to the public and scientific community.

(1) On the ground measurements

After the census, subsequent monitoring on Beehive (years 2 and 3) utilized permanent plots to collect data on overall survivorship, height, and cover. The sampling procedure is modified for the restoration setting from protocols developed by Dr. Dave Wood (CSUC) to establish permanent plots in riparian forests (personal communication). Some of the methods have been adapted from Elzinga *et al.* 1998.

All samples were based on 20 m x 50 m (1,000 sq. m) plots (quadrats) placed with the long axis oriented in a north-south direction. We used the grid cell method (overlaying each field with a 20 m x 50 m grid) to select sampled plots. The plots serve as areas to collect information on woody, shrub, and (if desired) herbaceous species.

Each location will be marked with wooden stakes and eventually a metal stake with a cap in the northwest corner of each plot. As future researchers may wish to return to our sites for further study, we have descriptions of plot locations and GPS coordinates. Data will be collected making extensive use of GPS devices to better integrate this information with the remote sensing demonstration described below.

We will assess the status and measure cover and height of all shrubs and trees inside the 20 m x 50 m plot. To assess the survivorship of planted species we will note their status: alive, dead, or not planted (missing) (from the database). Because restoration activities often create conditions that favor the survivorship and natural recruitment of native plants, we will also note newly recruited native riparian woody species.

The estimate of aerial cover of both trees and shrubs will be based on the longest diameter through the horizontal plane of the plant's drip line. We consider trees and shrubs together to make comparisons, but as the trees grow, their aerial cover may become hard to estimate. In such cases we may have to rely on the diameter at breast height (dbh) for the trees. Trees with a dbh of less than 1 cm will be rounded to 1 cm, because smaller stems are not likely to be considered main stems. Plants with multiple stems will be summed together. The height of all plants will be measured.

We measured all shrubs within the main plot. In time the row orientation will fade and post-restoration measurements are likely to include 3-10 m line intercepts fixed in the 20 x 50 m plot (at 10, 25, and 40 m). In addition, we envision 5 herbaceous plots (randomly selected in middle of the big plot) as part of any post restoration monitoring that may occur.

(2) Remote sensing

Another key component to this task is the comparison of remote sensing techniques with the on the ground evaluation. River Partners will work with Ayres Associates and the Geographical Information Center (GIC) at California State University Chico (CSUC) to map the Beehive Bend Restoration Area.

The approach is as follows:

- Data Collection and Set Control Points: Research existing data for local control points consistent with the 1997 river and floodplain mapping performed for the Corps of Engineers.
- Survey Control Points: Field survey to new control panels consistent with the control benchmarks and tie into local grid used for the planting plan.
- Aerial Photography: Perform color aerial flight of the mapping area compatible to produce final mapping product at a scale of 1-inch equals 100 feet.
- Mapping of the Project Area: Produce digital, georeferenced, photobase, color maps of the project area.
- Mapping Report: Prepare a brief letter report including survey control data and basis of mapping backup information.
- Analysis of the photographs and combine with the River Partners plant database created during implementation.

We hope that the product demonstrates means to assess cover and survivorship by species. Because of the extensive quantitive data collected on the ground, the combination of these methods will strengthen the accuracy of the analysis. We antipate that this information will demonstrate how remote sensing can be incorporated into project level analyses.

e) Task 5: Compare rodent populations between the restoration and other land uses

One of the assertions made in the plan (SRP 1999) was that rodent populations would decrease as the site transformation occurred. While we do not have baseline data from the site, the close proximity of other land uses allow us the unique opportunity to take a snap shot of rodent numbers in restoration, existing riparian, fallow, and agricultural areas at this point in time. This information has implications for neighbor relations and native plant recruitment. CSUC and River Partners staff will conduct the rodent trapping and analysis.

Small mammal sampling grids will be established on remnant riparian forests, the Beehive restoration site, fallow fields, and active orchards. One corner of the sampling grid will be located with a GPS so that all points within the grid can be tied into the remote sensing effort. Sampling at all sites will be conducted for two consecutive years in the spring and fall. We anticipate approximately 8 sites.

Sampling grids will consist of 100 Sherman live traps set 15 meters apart in a 10 x 10 grid (covering 135 meters squared). All traps within the grid will be labeled with a unique identifier based on their east-west and north-south positions within the grid. Sampling will be conducted at 3-4 sites simultaneously during the course of a sampling period so that all 12 sites may be sampled within a 30-day period.

In addition, we will conduct a cluster of pit fall traps to better assess the species differences between different land uses. We anticipate a much smaller sampling effort for this method than for the live traps, but it should provide some preliminary information

on species (e.g. voles) that may not be captured by the live traps. The pit fall traps will utilize a triad system consisting of three 15 meter long drift fences (forming a Y) with a 5-gallon bucket pitfall trap at each terminal end. A bucket will also be placed in the center between each arm of the fence.

Trapping sessions will occur over 4 consecutive nights. Traps will be set daily within 2 hours of sunset and checked daily within 3 hours of sunrise. Data collected from successful trap catches will include trap location, species caught, and whether or not the animal is a recapture (captured animals will be marked with dye).

Data collected on small mammals from both live-trapping and spot-map surveys, will be analyzed for significant differences in intraspecific (within species) relative abundances between habitat categories. Data analysis will include nonparametric tests (Kruskall-Wallis) for significant differences in median relative abundances between treatment (habitat) types by sampling season. MRPP (Multiple Response Permutation Procedures) will be used for secondary non-parametric multivariate analyses to test for significant differences in median relative abundances between treatment types during the course of the study using “whole assemblage” (all species tested simultaneously across all sites) data. Post-hoc analyses may include ordination of sites using a variety of techniques (including dendrograms and ordination in “species space”) in order to portray similarity of site sample assemblages in a graphical fashion.

f) Task 6: Produce a final report

Each of the components will be added to a comprehensive report that would synthesize the findings into a narrative to describe the ecological changes on the site due to the project. The report would also evaluate the Conceptual Site Model developed in the Restoration Plan and develop an updated version that would address the topics listed in this report. The findings of the vegetation, bird study, and focused rodent monitoring will translate into future management actions to benefit specific wildlife and vegetation targets. The funding supports a draft and final report. We intend to gather substantial input from peer and CALFED review of the document. We anticipate that the data collected and the novel application of remote sensing will provide good information for journal articles and scientific conference presentations, and plan to share this information with a wide audience.

5. Feasibility

Although the project applies some approaches in novel applications, the project uses standard methods and is technically feasible. We do not anticipate any issues surrounding access to study sites, as we have long-standing cooperative relationships with the Department of Fish and Game and US Fish and Wildlife Service. River Partners owns a walnut orchard approximately 1 mile from the Beehive Bend Unit, which may also be used as a reference site. We also have good cooperative work experience with the other partners in the project (PRBO, CSUC, Ayres Associates).

6. Expected Outcomes and Products

We anticipate the following deliverables associated with monitoring on the Beehive Bend restoration:

- Development of a monitoring plan.
- Two annual reports of the bird, rodent, and vegetation data collection.
- A final integrative report that merges the information collected during the project and evaluates (and adds to) the Conceptual Site Model.
- The assessment of the bird usage and population dynamics will describe the role restoration projects have in species recovery.
- The evaluation of vegetation features incorporated into the restoration design to benefit wildlife will improve the design features and implementation of future projects.
- The demonstration of remote sensing as a tool to assess survivorship and structure on a project scale will allow for a meaningful comparison between methods and may point to economical monitoring techniques on future projects.
- The comparison of rodent usage on conservation and agricultural land uses will be vital to inform SRCAF participants and land managers struggling to develop remedies for cross boundary problems.
- The project provides a rich amount of data that can be shared through presentations and journal articles.

7. Data Handling, Storage, and Dissemination

Data will be shared in a number of ways:

- Data collection for the bird data will be added to PRBO's data and reports on the Sacramento River.
- Reports and study findings will be presented to the Sacramento River Conservation Area Forum.
- Data and information collected for this project will be summarized in the reports listed including a comprehensive report that summarizes all site activities and lays out a blueprint for future monitoring.
- Reports will be made available on the River Partners website and to the Sacramento River Web and Sacramento River Portal website (and others as needed).
- Reports will be archived at Merriam Library at CSU Chico, DFW, USFWS, and River Partners.
- Our intent is to allow for regular examination of the site. Therefore, data handling and storage will be considered in the monitoring plan.
- Any mapping information will be shared with the CSU, Chico Geographic Information Center.
- We anticipate that the research from this program will generate scientific findings that will be shared with the research community through publications and presentations such as the CALFED Science conference.

Project staff and PRBO have extensive experience with data base management, in particular with the types of data described in the proposal. Data are entered and proofed daily and are stored in a format compatible with ArcView and ArcInfo Geographic Information Systems (GIS) and SQL-based database systems. Results, reports and appropriate data will be made available through the PRBO website http://www.prbo.org/cms/index.php. PRBO maintains daily, weekly, and seasonal backup copies of all data collected as standard procedure. Original data sheets are scanned into Pdf files at the end of each field season and stored off site. Bird monitoring data and metadata is stored in the California Partners in Flight database, which is part of the California Information Node of the National Biological Information Infrastructure. This is a public access resource and is maintained at the Information Center for the Environment by UC Davis staff (http://cain.nbii.gov/)

8. Public Involvement and Outreach

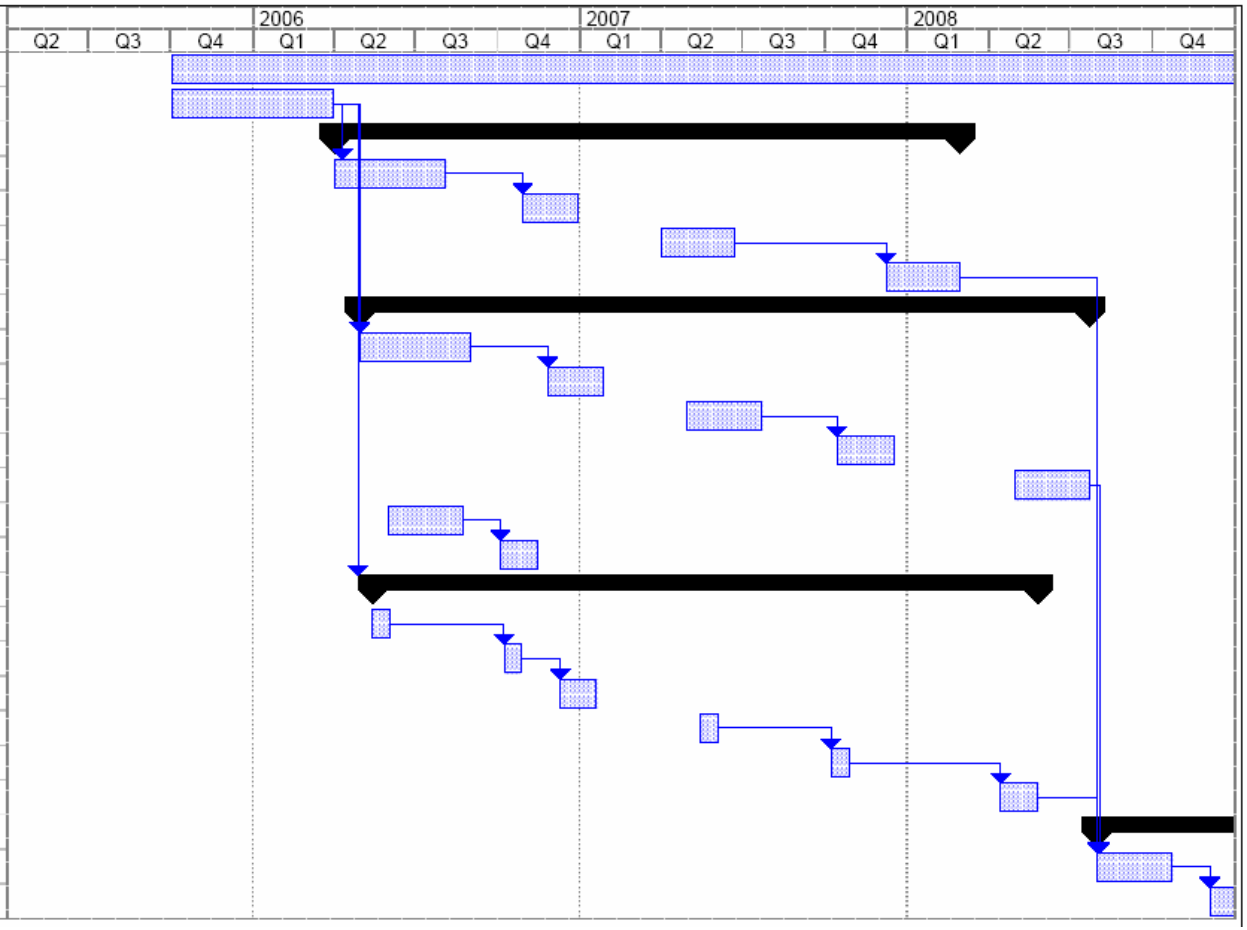
Through the SRCAF, cross boundary issues (such as pests) are of particular importance. We plan to present the information on the project, especially the rodent study, as the project continues. Because of the large number of participants and cooperators we anticipate that the sharing of information will stimulate examination and innovation in restoration and land management practices.

9. Work Schedule

A proposed work schedule is presented in Table 3.

Table 3. Project Timeline for the Beehive Bend monitoring project.

Task Name	Start
Project management	Mon 10/3/05
Monitoring plan	Mon 10/3/05
Bird monitoring	**Mon 4/3/06**
Yr 1 sampling	Mon 4/3/06
Yr 1Reporting	Mon 10/30/06
Yr 2 sampling	Mon 4/2/07
Final Bird Report	Mon 12/10/07
Vegetation monitoring	**Mon 5/1/06**
Yr 1 sampling	Mon 5/1/06
Yr 1Reporting	Mon 11/27/06
Yr 2 sampling	Tue 5/1/07
Yr 2 Reporting	Tue 10/16/07
Yr 3 sampling	Thu 5/1/08
Remote sensing	Thu 6/1/06
Remote sensing analysis	Thu 10/5/06
Rodent monitoring	**Mon 5/15/06**
Yr 1 Spring monitoring	Mon 5/15/06
Yr 1 Fall monitoring	Mon 10/9/06
Yr 1 Reporting	Mon 12/11/06
Yr 2 Spring monitoring	Tue 5/15/07
Yr 2 Fall monitoring	Tue 10/9/07
Yr 2 Reporting	Tue 4/15/08
Develop a comprehensive repor	**Fri 8/1/08**
Draft report	Fri 8/1/08
Final report	Fri 12/5/08



PROPOSAL

B. Applicability to CALFED Bay-Delta Program ERP Goals, the ERP Draft Stage 1 Implementation Plan, and CVPIA Priorities.

In this section of your proposal explain how the outcomes of your project relate to the goals and priorities of the CALFED Bay-Delta
Program, the ERP, and the CVPIA.

1. ERP and CVPIA Priorities

This proposal addresses thee of the six goals identified in the ERP Draft Stage 1 Implementation Plan (Goal 1: At Risk Species, Goal 4: Habitats, and Goal 5: Non-native invasive species). This project will incidentally touch on Goal 2 (Ecosystem Processes and Biotic Communities) by reversing the physical processes that influence establishment of non-native species. The avian and rodent monitoring outlined in this proposal will identify species inhabitance and recovery in a previously restored Valley/Foothill Riparian Community along the Sacramento River as well as evaluate riparian habitat functionality and displacement of non-native species.

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

This study will generate new as well as expand upon previous strategies to restore riparian habitat. Project findings will be documented and made available to future researches interested in restoration of diminishing riparian habitat. Avian monitoring will provide more information about the criteria necessary for seasonal bird species inhabitance of native riparian areas.

3. Additional Information for Proposals Containing Land Acquisition

C. Qualifications.

Provide brief biographical sketches of the principal participants, Identifying education and relevant experience as well as contributions (e.g., completed projects, published reports on the same topic) consistent with their roles and responsibilities in the proposed projects.

River Partners

Dan Efseaff received a B.S. in Biology from U.C. Davis and a M.S. in Biology from C.S.U. Chico, where he researched the interaction of riparian tree roots with soil types. He has 12 years of broad experience working for natural resource agencies, consulting firms, and research institutions. Since the beginning of his employment with River Partners in 1991, he has taken on the role of Restoration Ecologist and developed sampling programs, prepared ecological risk assessments, conducted botanical surveys, and constructed plant designs based

on soil type. Mr. Efseaff will serve as the project lead and coordinate the efforts of other collaborators.

Helen Swagerty received a B.S. in Environmental Science from Oregon State University. She began her experience with River Partners as an Americore Volunteer in 2000. She is currently River Partner's Restoration Biologist for the Sacramento Valley and has conducted and organized monitoring surveys for valley elderberry longhorn beetle, plant survivorship and vigor, and native grass establishment and completes monitoring reports.

Michelle Cederborg obtained a B.S. in Biology and a M.S. in Botany at CSU Chico. She has previous experience in horticulture, vegetation sampling, and rare plant surveys through a three-year student assistantship with Department of Water Resources. As a Biological Technician with River Partners, she monitors plants survivorship and growth, leads the seed collection process and completes monitoring reports.

Paul Kirk has experience as a seasoned educator and in conducting floristic surveys. With River Partners, he monitors vegetation, writes scientific reports and coordinates and performs educational activities with school and community groups. He received a B.A. in Biology and Chemistry, teaching credentials in Bilingual Multiple Subjects and Life Science and a M.S. in Botany at CSU Chico.

Tom Griggs has 22 years of experience in riparian restoration. He developed the original riparian restoration efforts on the Sacramento River and has been published extensively in professional journals on riparian restoration. He obtained a B.S. in Biology from California Polytechnic University, Pomona, a M.S. in Botany from C.S.U. Chico and a Ph.D. in ecology from U.C. Davis. In 2001, he became the Senior Restoration Ecologist for River Partners where he has played a major role in the successful restoration of many northern California sites, including those managed by private owners, Sacramento River and San Joaquin River National Wildlife Refuge, and California Department of Fish and Game.

PRBO

Tom Gardali grew up in California's Great Central Valley. He earned an undergraduate degree in Environmental Studies from the University of California at Santa Cruz in 1992 and has been a field biologist and ecologist for PRBO since 1993. His research interests are conservation oriented and range from natural history to restoration to the effects of habitat succession and climate patterns on birds. He has authored over 15 peer-reviewed publications and oversees field crews for 8 different projects in the Central California Region for the Terrestrial Ecology Division.

Geoffrey R. Geupel has a degree from Lewis and Clark College (BS Biology 1978) and has been employed as a biologist at PRBO for 24 years. He is

currently Director of the PRBO's Terrestrial Ecology Division Program with a $1.7 million annual budget and 40 field biologists Mr. Geupel with over 25 years experience in ornithological monitoring and research, has authored over 30 refereed publications including Field Methods for Monitoring Landbirds published in 1993 buy the USFS and has helped define bird-monitoring protocols now used throughout North America. Current areas of interest include population biology, bird response to habitat restoration, and conservation planning. He is currently: Co-Chair of California Partners in Flight, Chair of the Riparian Habitat Joint Venture's Science Committee, Board member of the Central Valley Joint Venture and Sonoran Joint Venture, and member of both the National Cowbird Advisory Council and Important Bird Area (IBA) National Technical Committee.

Christine A. Howell has degrees from the University of California Berkeley (B.A. Biology 1991) and the University of Missouri Columbia (PhD Ecology 1999). Her doctoral research focused on avian demography and life history evolution in a coastal California population of Song Sparrows. In 2000 she received an National Science Foundation Post-doctoral Fellowship in Biological Informatics to pursue research in collaboration with Missouri Botanical Garden and the International Center for Tropical Ecology at the University of Missouri Saint Louis. Her NSF research focused on the development and use of spatially explicit models and statistics (applying Geographic Information System technology) as practical tools in coarse-grain conservation studies. She uses these approaches to test hypotheses about the distributions of rare species, conservation reserve design, and the implications of global climate change. In 2004 she joined the staff of PRBO as a Conservation Scientist.

CSUC

Chuck Nelson has been the Director of the Geographical Information Center since it was formed in 1995 and also managed its predecessor, the Center for Planning and Geographical Research. He has an M.A. in Geography. Mr. Nelson has been involved in numerous remote sensing, GIS and digital mapping efforts in Northern and Central California and specializes in resource and local government GIS applications. His involvement in the Sacramento River Stream Corridor Protection Program was the first large-scale effort to classify and map riparian vegetation on the entire Sacramento River mainstem and valley tributary streams. Chuck has worked for the university for over 30 years and has taught cartography, map reading and airphoto interpretation classes as an adjunct research professor of geography.

Jason Schwenkler has worked in the GIC for seven years. He has been project manager for mapping efforts along the lower and upper Sacramento, the Feather, and San Joaquin River projects. Jason is a graduate of California State University, Chico. He has a degree in Recreation and Park Management with emphasis in ecosystem management and fire ecology and a minor in geography. Mr. Schwenkler also has seven years of hands-on experience in GIS, GPS and remote sensing applications.

John W. Hunt has a degree from California State University, Chico (M.S. Biology 2004). He has worked as a field technician and biologist since 1991. He has conducted and participated in field investigations throughout California, ranging from examination of nitrogen mineralization rates in response to riparian habitat restoration efforts to rare plant and wildlife surveys. He has surveyed taxa ranging from terrestrial invertebrates to small mammal and bird communities to raptors and mid-sized forest carnivores. John has authored and co-authored several riparian habitat restoration plans for The Nature Conservancy's Sacramento River Project and The California Department of Fish and Game. John's primary interests are in the design and implementation of surveys which examine ecosystem response to management actions and the application of this information to future land management decisions. John is currently an ecologist and project manager for the Bidwell Environmental Institute.

D. Cost.

1. Budget

The total cost for this project is $364,155. A detailed budget is provided on the PSP website's budget forms.

2. Cost sharing

CSUC can supply the Sherman live traps for the rodent sampling ($5,000). We anticipate that most of the comparisons with past aerial photographs are available from CSUC or the California Department of Water Resources.

3. Long-term funding strategy

The project will be set up to allow for future monitoring at periodic intervals. Potential monitoring may be continued by the Department of Fish and Game, although no future funding has been identified at this time.

E. Compliance with Standard Terms and Conditions.

River Partners is currently working under CALFED-issued contracts. We do not anticipate any problems with future contracts. We are willing and able to comply with the terms of standard ERP agreements.

F. Literature Cited.

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[SRP] Sacramento River Partners. 1999. Restoration Plan for River Mile 169.5 R Beehive Bend Unit. California Department of Fish and Game. Gregory A. Treber, author. Chico, California.

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Small, S.L., N. Nur, A. Black, G.R. Geupel, D. Humple, and G. Ballard. 2000. Riparian bird population of the Sacramento Rivers system: results from the 1993-1999 field seasons. PRBO unpublished report.

Smallwood, Shawn K., Shu Geng, Minghua Zhang. 2001. Comparing pocket gopher (Thomomys bottae) density in alfalfa stands to assess management and conservation goals in northern California. Agriculture, Ecosystems and Environment 87: 93–109.

G. Nonprofit Verification.

Internal Revenue Service

Date: October 6, 2003

River Partners
% John Carlon
539 Flume Street
Chico, CA 95928

Department of the Treasury
P. O. Box 2508
Cincinnati, OH 45201

Person to Contact:
Kaye Keyes 31-07416
Customer Service Specialist
Toll Free Telephone Number:
8:00 a.m. to 6:30 p.m. EST
877-829-5500
Fax Number:
513-263-3756
Federal Identification Number:
94-3302335

Dear Sir or Madam:

This is in response to your request of October 6, 2003, regarding your organization's tax-exempt status.

In December 1998 we issued a determination letter that recognized your organization as exempt from federal income tax. Our records indicate that your organization is currently exempt under section 501(c)(3) of the Internal Revenue Code.

Based on information subsequently submitted, we classified your organization as one that is not a private foundation within the meaning of section 509(a) of the Code because it is an organization described in sections 509(a)(1) and 170(b)(1)(A)(vi).

This classification was based on the assumption that your organization's operations would continue as stated in the application. If your organization's sources of support, or its character, method of operations, or purposes have changed, please let us know so we can consider the effect of the change on the exempt status and foundation status of your organization.

Your organization is required to file Form 990, Return of Organization Exempt from Income Tax, only if its gross receipts each year are normally more than $25,000. If a return is required, it must be filed by the 15th day of the fifth month after the end of the organization's annual accounting period. The law imposes a penalty of $20 a day, up to a maximum of $10,000, when a return is filed late, unless there is reasonable cause for the delay.

All exempt organizations (unless specifically excluded) are liable for taxes under the Federal Insurance Contributions Act (social security taxes) on remuneration of $100 or more paid to each employee during a calendar year. Your organization is not liable for the tax imposed under the Federal Unemployment Tax Act (FUTA).

Organizations that are not private foundations are not subject to the excise taxes under Chapter 42 of the Code. However, these organizations are not automatically exempt from other federal excise taxes.

Donors may deduct contributions to your organization as provided in section 170 of the Code. Bequests, legacies, devises, transfers, or gifts to your organization or for its use are deductible for federal estate and gift tax purposes if they meet the applicable provisions of sections 2055, 2106, and 2522 of the Code.

River Partners
94-3302335

Your organization is not required to file federal income tax returns unless it is subject to the tax on unrelated business income under section 511 of the Code. If your organization is subject to this tax, it must file an income tax return on the Form 990-T, Exempt Organization Business Income Tax Return. In this letter, we are not determining whether any of your organization's present or proposed activities are unrelated trade or business as defined in section 513 of the Code.

Section 6104 of the Internal Revenue Code requires you to make your organization's annual return available for public inspection without charge for three years after the due date of the return. The law also requires organizations that received recognition of exemption on July 15, 1987, or later, to make available for public inspection a copy of the exemption application, any supporting documents and the exemption letter to any individual who requests such documents in person or in writing. Organizations that received recognition of exemption before July 15, 1987, and had a copy of their exemption application on July 15, 1987, are also required to make available for public inspection a copy of the exemption application, any supporting documents and the exemption letter to any individual who requests such documents in person or in writing.
For additional information on disclosure requirements, please refer to Internal Revenue Bulletin 1999 - 17.

Because this letter could help resolve any questions about your organization's exempt status and foundation status, you should keep it with the organization's permanent records.

If you have any questions, please call us at the telephone number shown in the heading of this letter.

This letter affirms your organization's exempt status.

Sincerely,

John E. Ricketts, Director, TE/GE
Customer Account Services

Tasks And Deliverables

Assessment of vegetative and wildlife responses to innovative restoration design on the beehive bend unit

Task ID	Task Name	Start Month	End Month	Deliverables
1	Project Management	1	36	Semiannual and final reports. Periodic invoices
2	Monitoring plan	1	6	Monitoring plan
3	Bird monitoring	1	36	2 Annual reports
4	Vegetation monitoring	1	36	2 Annual reports
5	Rodent trapping	1	36	2 Annual report
6	Reporting	1	36	Draft and Final Report

Comments

If you have comments about budget justification that do not fit elsewhere, enter them here.

Additional deliverables will be included in the reports, but the reports will be a central depository of information.

Budget Summary

Project Totals

Labor	Benefits	Travel	Supplies And Expendables	Services And Consultants	Equipment	Lands And Rights Of Way	Other Direct Costs	Direct Total	Indirect Costs	Total
$81,163	$21,132	$3,059	$7,850	$179,550	$8,200	$0	$0	$300,954	$63,202	$364,156

Do you have cost share partners already identified?
Yes.

If yes, list partners and amount contributed by each:

see proposal

Do you have potential cost share partners?
No.

If yes, list partners and amount contributed by each:

Are you specifically seeking non−federal cost share funds through this solicitation?
No.

Assessment of vegetative and wildlife responses to innovative restoration design on the beehive bend unit

Assessment of vegetative and wildlife responses to innovative restoration design on the beehive bend unit

Year 1 (Months 1 To 12)

Task	Labor	Benefits	Travel	Supplies And Expendables	Services And Consultants	Equipment	Lands And Rights Of	Other Direct	Direct Total	Indirect Costs	Total

							Way	Costs			
1: project management (12 months)	**3312**	**602**	**0**	**0**	**0**	**0**	**0**	**0**	$3,914	**822**	$4,736
2: Monitoring plan (6 months)	**7922**	**2230**	**150**	**1000**	**3000**	**0**	**0**	**0**	$14,302	**3004**	$17,306
3: Bird monitoring (12 months)	**1660**	**461**	**0**	**0**	**41900**	**0**	**0**	**0**	$44,021	**9244**	$53,265
4: Vegetation monitoring (12 months)	**13477**	**3668**	**800**	**600**	**32500**	**6300**	**0**	**0**	$57,345	**12042**	$69,387
5: Rodent trapping (12 months)	**6597**	**1836**	**400**	**2500**	**17000**	**200**	**0**	**0**	$28,533	**5992**	$34,525
6: Reporting (12 months)	**8800**	**2400**	**50**	**1000**	**1200**	**0**	**0**	**0**	$13,450	**2825**	$16,275
Totals	**$41,768**	**$11,197**	**$1,400**	**$5,100**	**$95,600**	**$6,500**	**$0**	**$0**	**$161,565**	**$33,929**	**$195,494**

Year 2 (Months 13 To 24)

Task	Labor	Benefits	Travel	Supplies And Expendables	Services And Consultants	Equipment	Lands And Rights Of Way	Other Direct Costs	Direct Total	Indirect Costs	Total
1: project management (12 months)	**1756**	**361**	**0**	**0**	**0**	**0**	**0**	**0**	$2,117	**445**	$2,562
3: Bird monitoring	**552**	**160**	**48**	**0**	**36900**	**0**	**0**	**0**	$37,660	**7909**	$45,569

(12 months)											
4: Vegetation monitoring (12 months)	**8885**	**1122**	**480**	**350**	**7000**	**550**	**0**	**0**	$18,387	**3861**	$22,248
5: Rodent trapping (12 months)	**4576**	**1335**	**456**	**0**	**15000**	**150**	**0**	**0**	$21,517	**4519**	$26,036
6: Reporting (12 months)	**6548**	**1871**	**50**	**750**	**850**	**0**	**0**	**0**	$10,069	**2115**	$12,184
Totals	**$22,317**	**$4,849**	**$1,034**	**$1,100**	**$59,750**	**$700**	**$0**	**$0**	**$89,750**	**$18,849**	**$108,599**

Year 3 (Months 25 To 36)

Task	Labor	Benefits	Travel	Supplies And Expendables	Services And Consultants	Equipment	Lands And Rights Of Way	Other Direct Costs	Direct Total	Indirect Costs	Total
1: project management (12 months)	**927**	**232**	**0**	**0**	**0**	**0**	**0**	**0**	$1,159	**243**	$1,402
3: Bird monitoring (12 months)	**434**	**134**	**100**	**0**	**21700**	**0**	**0**	**0**	$22,368	**4697**	$27,065
4: Vegetation monitoring (12 months)	**4947**	**1482**	**425**	**150**	**0**	**1000**	**0**	**0**	$8,004	**1681**	$9,685
5: Rodent trapping (12 months)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$0	**0**	$0
6: Reporting (12 months)	**10770**	**3238**	**100**	**1500**	**2500**	**0**	**0**	**0**	$18,108	**3803**	$21,911

Totals	**$17,078**	**$5,086**	**$625**	**$1,650**	**$24,200**	**$1,000**	**$0**	**$0**	**$49,639**	**$10,424**	**$60,063**

Budget Justification

Assessment of vegetative and wildlife responses to innovative restoration design on the beehive bend unit

Labor

Yr 1 Task 1 Project Manager – 5 hrs @ $46.13/hr Restoration Ecologists – 84 hrs @ $26.40/hr Accounting − 36 hrs @ $24.00/hr

Task 2 Senior Restoration Ecologists – 25 hrs @ $31.69/hr Restoration Ecologists – 83 hrs @ $26.40/hr Biology Technicians − 326 hrs @ $15.15/hr

Task 3 Restoration Ecologists − 21 hrs @ $26.40/hr Biology Technicians − 73 hrs @ $15.15/hr

Task 4 Senior Restoration Ecologists – 42 hrs @ $31.69/hr Restoration Ecologists – 112 hrs @ $26.40/hr Biologists – 241 hrs @ $16.82/hr Biology Technicians − 339 hrs @ $15.15/hr

Task 5 Senior Restoration Ecologists – 21 hrs @ $31.69/hr Restoration Ecologists – 55 hrs @ $26.40/hr Biologists – 79 hrs @ $16.82/hr Biology Technicians − 208 hrs @ $15.15/hr

Task 6 Senior Restoration Ecologists – 55 hrs @ $31.69/hr Restoration Ecologists – 73 hrs @ $26.40/hr Biologists – 105 hrs @ $16.82/hr Biology Technicians − 222 hrs @ $15.15/hr

Yr 2 Task 1 Project Manager – 2 hrs @ $47.79/hr Restoration Ecologists – 28 hrs @ $27.35/hr Accounting − 36 hrs @ $24.86/hr

Task 3 Restoration Ecologists − 7 hrs @ $27.35/hr Biology Technicians − 23 hrs @ $15.69/hr

Task 4 Senior Restoration Ecologists – 27 hrs @ $32.83/hr Restoration Ecologists – 71 hrs @ $27.35/hr Biologists – 152 hrs @ $17.42/hr Biology Technicians − 214 hrs @ $15.69/hr

Task 5 Senior Restoration Ecologists – 14 hrs @ $32.83/hr Restoration Ecologists – 37 hrs @ $27.35/hr Biologists – 53 hrs @ $17.42/hr Biology Technicians – 139 hrs @ $15.69/hr

Task 6 Senior Restoration Ecologists – 40 hrs @ $32.83/hr Restoration Ecologists – 53 hrs @ $27.35/hr Biologists – 75 hrs @ $17.42/hr Biology Technicians – 158 hrs @ $15.69/hr

Yr 3 Task 1 Accounting – 36 hrs @ $25.75/hr

Task 3 Restoration Ecologists – 5 hrs @ $28.33/hr Biology Technicians – 18 hrs @ $16.26/hr

Task 4 Senior Restoration Ecologists – 14 hrs @ $34.01/hr Restoration Ecologists – 39 hrs @ $28.33/hr Biologists – 82 hrs @ $18.05/hr Biology Technicians – 116 hrs @ $16.26/hr Task 6 Senior Restoration Ecologists – 63 hrs @ $34.01/hr Restoration Ecologists – 84 hrs @ $28.33/hr Biologists – 120 hrs @ $18.05/hr Biology Technicians – 251 hrs @ $16.26/hr

Benefits

Yr 1 Project Manager – 17.22% Senior Restoration Ecologists – 27.53% Restoration Ecologists – 16.39% Biologists – 27.08% Biology Technicians – 33.47% Accounting – 23%

Yr 2 Project Manager – 17.83% Senior Restoration Ecologists – 29.04% Restoration Ecologists – 16.95% Biologists – 28.36% Biology Technicians – 35.23% Accounting – 23.94%

Yr 3 Project Manager – 18.51% Senior Restoration Ecologists – 30.69% Restoration Ecologists – 17.58% Biologists – 29.79% Biology Technicians – 37.16% Accounting – 24.98%

Travel

Yr 1 Task 2 River Partners Vehicle 272 miles @ .55/mile Task 4 River Partners Vehicle 1,454 miles @ .55/mile Task 5 River Partners Vehicle 727 miles @ .55/mile Task 6 River Partners Vehicle 91 miles @ .55/mile

Yr 2 Task 3 River Partners Vehicle 87 miles @ .55/mile Task 4 River Partners Vehicle 873 miles @ .55/mile Task 5 River Partners Vehicle 829 miles @ .55/mile Task 6 River Partners Vehicle 91 miles @ .55/mile

Yr 3 Task 3 River Partners Vehicle 182 miles @ .55/mile Task 4 River Partners Vehicle 773 miles @ .55/mile Task 6 River Partners Vehicle 182 miles @ .55/mile

Supplies And Expendables

Yr 1 Task 2 Office Supplies $1,000 Task 4 Field Supplies $600

Task 5 Field Supplies $2,500

Task 6 Office Supplies $1,000

Yr 2 Task 4 Field Supplies $350

Task 6 Office Supplies $750

Yr 3 Task 4 Field Supplies $150

Task 6 Office Supplies $1,500

Services And Consultants

Yr 1 Task 2 CSUC Research Foundation – Map creation $1,000 TBD – creation of graphs $1,000 TDB – peer reviewer $1,000 Task 3 PRBO – Bird monitoring $41,900 (includes wages, supplies, housing & utilities and overhead) Task 4 CSUC Research Foundation – Map creation and analysis $15,000 Ayers – Ariel photos and surveying $17,500 Task 5 CSUC Research Foundation – Conducting live trappings of rodents and study $17,000 (includes wages, supplies and overhead) Task 6 TBD – peer reviewer $1,200

Yr 2 Task 3 PRBO – Bird monitoring $36,900 (includes wages, supplies, housing & utilities and overhead) Task 4 CSUC Research Foundation – Map updates $4,000 TBD– Ariel photos $3,000 Task 5 CSUC Research Foundation – Conducting live

trappings of rodents and study $15,000 (includes wages, supplies and overhead) Task 6 TBD – peer review $850

Yr 3 Task 3 PRBO – Bird monitoring $21,700 (includes wages, supplies, housing & utilities and overhead) Task 6 TBD – peer review $2,

Equipment

Yr 1 Task 4 TBD – GPS/PDA data logger (Manufacturer to be determined)$6,000 Use of River Partners equipment (Quad) $300 Task 5 Use of River Partners equipment (Quad) $200

Yr 2 Task 4 Use of River Partners equipment (Quad) $550 Task 5 Use of River Partners equipment (Quad) $150

Yr 3 Task 4 Use of River Partners equipment (Quad) $1,000

Lands And Rights Of Way

None

Other Direct Costs

None

Indirect Costs/Overhead

River Partners average annual overhead rate is 21%. This is the existing rate on current CALFED contracts.

Comments

Environmental Compliance

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CEQA Compliance

Which type of CEQA documentation do you anticipate?
X none
− negative declaration or mitigated negative declaration
− EIR
− categorical exemption

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.

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
– environmental assessment/FONSI
– EIS
– categorical exclusion

Identify the lead agency or agencies.

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	–	–	
1602	–	–	
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	**–**	**–**	
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

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Does the project involve land acquisition, either in fee or through easements, to secure sites for monitoring?
X No.
– Yes.

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 provide operations and maintenance services.

Is there an existing plan describing how the land and water will be managed?
– No.
– Yes.

Will the applicant require access across public or private property that the applicant does not own to accomplish the activities in the proposal?
X No.
– Yes.

Describe briefly the provisions made to secure this access.

Do the actions in the proposal involve physical changes in the current land use?
X No.
– Yes.

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.
– Yes.

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.
– Yes.

Is the land affected by the project currently under a Williamson Act contract?
X No.
– Yes.

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

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