Summary Information

River Partners

Sub−surface water quality monitoring on restored riparian sites along the middle Sacramento River

Amount sought: $409,350

Duration: 36 months

Lead investigator: Dr. Lee Altier, Calif State University, Chico

Short Description

This project will monitor the sub−surface soil water under planted riparian restoration sites adjacent to the Sacramento River between Red Bluff and Chico. The restoration plantings were originally carried out with the goal of improving wildlife habitat and populations (ERP Goal 3). This project will monitor the sub−surface groundwater at three historic restoration sites for concentrations of nitrates, redox potential, dissolved oxygen content and isotopic ratios of water.

Executive Summary

EXECUTIVE SUMMARY

SUB−SURFACE WATER QUALITY MONITORING ON RESTORED RIPARIAN SITES ALONG THE MIDDLE SACRAMENTO RIVER.

This project will monitor the sub−surface soil water under planted riparian restoration sites adjacent to the Sacramento River between Red Bluff and Chico. The restoration plantings were originally carried out with the goal of improving wildlife habitat and populations (ERP Goal 3). Approximately 4,000 acres of native riparian vegetation has been planted along the middle Sacramento River since the mid 1990s. Virtually all the restored acres lie adjacent to the Sacramento River and adjacent to cultivated farmland. This proposal addresses ERP Goal 6 – water quality improvements – and will monitor the sub−surface groundwater at three historic restoration sites for concentrations of nitrates, redox potential, dissolved oxygen content and isotopic ratios of water. The latter is a method for “fingerprinting” water, so that we can determine the source of the water in the monitoring wells as being either from the river, or from the uplands. The monitoring wells will be installed in a grid of 16: one row of

four wells at the edge of the restoration adjoining the upland agriculture area, two more rows within the restoration area, and a fourth row at the lower edge of the planting. Results will be presented as contour maps of the measured parameters. Correlating the parameters with each other should reveal any possible effects of the restoration planting upon them. The results, in themselves, will be new information for the Sacramento Valley, however, even more important will be the testing of these methods for our understanding of the effects of riparian vegetation upon subsurface water quality.

CALFED ERP 2004 Monitoring Proposal

SUB-SURFACE WATER QUALITY MONITORING ON RESTORED RIPARIAN SITES ALONG THE MIDDLE SACRAMENTO RIVER

1. Problem, Goals, and Objectives

Describe the previously-funded restoration action(s) that you propose to monitor and evaluate. Summarize each prior action briefly, including the restoration action's setting, with maps or photographs, if applicable. Explain the current status of the action(s), highlighting accomplishments to date.

This proposal will monitor the quality of the shallow ground water that moves through planted riparian restoration vegetation from upland agricultural lands. Previously funded CALFED acquisition and restoration sites along the Sacramento River will be monitored to determine the ability of the restored vegetation to sequester water soluble nutrients from the shallow soil water table that moves across the restoration planting from upland agricultural sources. We will select three sites for monitoring based upon reconnaissance of site conditions after the grant is awarded.

In the mid 1990s CALFED funds were used to purchase flood-prone properties along the middle Sacramento River (Red Bluff to Colusa) for the purpose of restoration of wildlife habitat. The properties were typically the lowest fields on a farm and were costly to farm because they lie adjacent to the river and suffered frequent flood damage. Purchased properties were transferred to state or federal land management agencies for long-term management and restoration.

Restoration involved planting woody riparian vegetation composed of over a dozen species on riparian trees and shrubs, configured to provide optimum habitat for target wildlife species. Restoration implementation involves three years of weed control and irrigation before the planted trees and shrubs are left to their own devices. The restoration projects that we will monitor in this study have been without irrigation and weed control for several years.

Describe the problem that the restoration action(s) addresses. Clearly state the goals and objectives of the restoration action(s) that you propose to monitor.

The problem originally addressed by the restoration of the properties was low numbers in target wildlife populations (ERP Strategic Goal 4). At the time the restoration projects were planned and implemented, monitoring soil water for nutrients was not an immediate concern, nor would it have generated any useful information. Today the objectives of this proposal are presenting themselves. While planting a riparian buffer strip to filter nutrients out of soil water was not a stated goal of these restoration projects, improved water quality is ERP Strategic Goal 6. This proposal will adapt standard methods of shallow ground water monitoring to the flood plain of the Sacramento River.

Agricultural fertilizers (such as nitrates) and pesticides that are found in the Sacramento River and its floodplain are sourced in agricultural fields near the river, and are likely not being delivered by tributaries. Most of the watershed of the upper and middle Sacramento River is undeveloped, with land uses of livestock rangeland and timber harvesting.

In conjunction with in-field soil conservation practices, the maintenance of riparian areas as buffer zones below agricultural fields can reduce agricultural pollutants entering streams (Lowrance et al., 1983; Lowrance et al., 1984; Peterjohn and Correll, 1984; Jacobs and Gilliam, 1985; Dillaha et al., 1989). Although their potential benefits have been well documented elsewhere (Lowrance et al., 1997; Sheridan et al., 1999), in the western U.S. there have been few studies investigating the effectiveness of riparian buffer systems for the control of water-borne pollutants.

Nitrogen is frequently a major component of subsurface water contamination from agriculture (Hubbard et al., 2004). Vegetation in a riparian area has the potential to control nitrogen as a result of two main effects: 1) an actively growing plant community can extract nitrogen from the soil through the roots and sequester it in the standing biomass; and 2) organic matter deposited in the surface soil provides a substrate for denitrifying organisms which are active under saturated conditions (Lowrance et al., 1997).

The extent to which these processes occur in a riparian area is dependent upon the interaction of climate, soil characteristics, hydrology, and plant growth. Previous monitoring in various areas has shown that plant uptake or denitrification may be very high when there is a combination of actively growing vegetation and subsurface water movement from the upland that is confined within the root zone (Lowrance et al., 2000).

The organophosphate pesticide diazinon is used extensively as a dormant spray in the stone fruit and nut orchards of the Sacramento Valley (DPR, 2002). In studies within the Sacramento watershed by the California Department of Pesticide Regulation between 1997 and 1999, diazinon was the most frequently detected pesticide. Although other pesticides were also detected, diazinon was the only one correlated with observed toxicity (Nordmark, 1998, 1999; Nordmark et al., 1998).

Studies that have evaluated the water quality benefits of riparian buffers have usually focused on low-order streams where there is little incidence of flooding and there is a significant degree of shallow sub-surface water movement. Deeper water movement from the upland or patterns of plant dormancy during periods of high nitrogen loading from the uplands may result in less effective control (Lowrance et al., 1997). Within the catchment of the Sacramento River, much of the crop production occurs near the main branch of the river rather than along the tributaries. For this reason, the river itself may be the direct recipient of pollutant loading from adjacent upland areas.

Coincidental with seasonal changes in precipitation and depth of the Sacramento River, direction of groundwater movement in riparian areas can be expected to vary

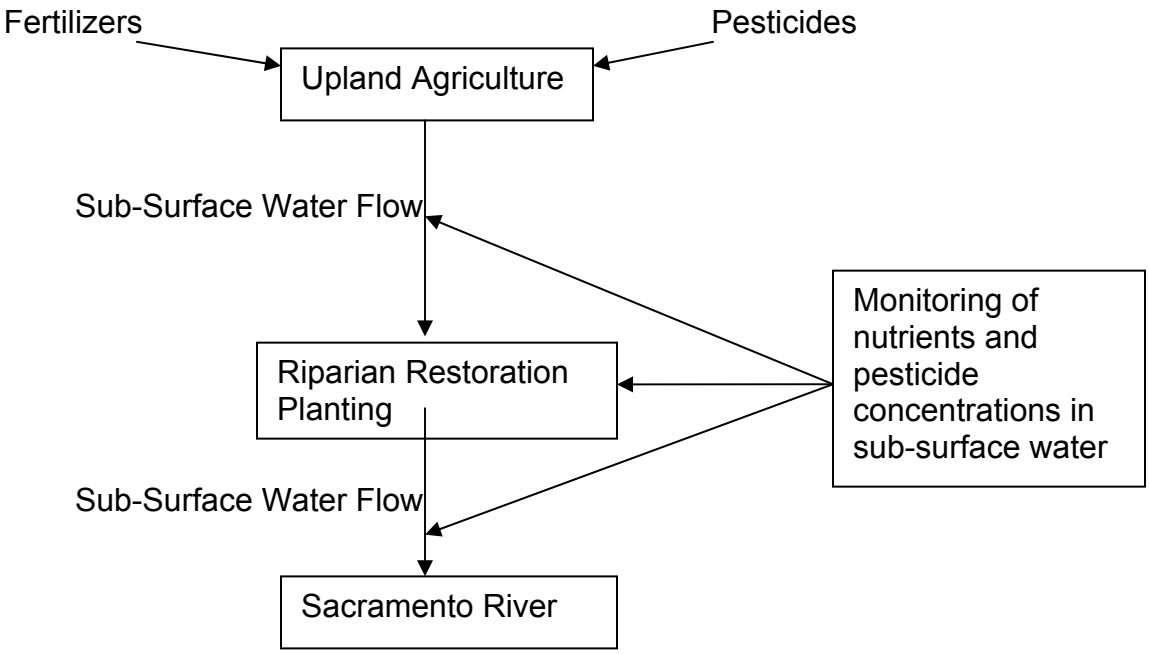
throughout the year (Hinkle et al., 2001; Pinder and Sauer, 1971). Isotopic analysis can provide identification of chemical signatures pertaining to sources of sub-surface water and be used to determine the mixing patterns of stream, upland, and precipitation water.

2. Justification

Present a conceptual model that explains your understanding of the key ecosystem components and functions that are relevant to the restoration action(s) that you propose to monitor or evaluate. Model should show your hypotheses regarding the cause and effect relationships between the restoration action(s) and its expected outcomes.

Figure 1 presents a conceptual model for this project. Fertilizers and pesticides applied to agricultural crops on the higher portions of the floodplain and adjacent to riparian restoration plantings enter the soil and the sub-surface water table. The sub-surface water moves down slope and under the riparian restoration planting where the root systems of the vegetation sequesters the nutrients and fertilizer residues. By the time the sub-surface flows reach the river, the concentration of pollutants is reduced when compared to agricultural fields.

Figure 1. Conceptual Model for Sub-Surface water flow from uplands through riparian restoration planting to the river.



Hypotheses

- Riparian vegetation will lower the concentration of nitrates in sub-surface water.
- Water from the river has a minor effect on sub surface nitrate concentrations
- No residues remain from historic pesticide use on the restoration sites.

Objectives: This project will:

1) determine seasonal flow patterns of groundwater in several restored riparian areas;
2) estimate the amount of nitrate loading from upland agriculture and subsequent mitigating influence of the riparian areas;
3) correlate changes in groundwater nitrate with dissolved organic carbon (DOC) and redox potential; and
4) try to document historical applications of diazinon in the restored sites and determine whether there is any persistent diazinon in the groundwater

3. Previously Funded Monitoring

None in the Sacramento Valley that the authors are aware of.

4. Approach and Scope of Work

Describe the approach and each major task you will undertake to complete your project; if appropriate, include planning, sampling, or other monitoring protocols, and evaluation methods. Include specific information about methods and techniques, equipment and facilities, data collection, statistical analysis and quality assurance procedures. Explain the criteria you will test your hypotheses.

Methods

Site Selection – Task 2

Three sites will be selected for initial monitoring. If matching funds are obtained, two more sites may be added. Locations will be chosen that are susceptible to chemical loading from upland agricultural sites. Locations will also be favored which have shallow ground water movement through the root zone, where vegetation could have a significant effect on controlling water quality.

Piezometer Installation – Task 2

At each site, a grid of 16 sampling wells (piezometers) will be installed for measuring ground water levels and nitrogen. The grid will comprise a row of four wells at the edge of the buffer adjoining the upland agricultural area, two rows within the buffer, and a fourth row at the lower edge of the buffer. Wells will extend to seven meters depth. Wells will be made from 1.9 cm (0.75”) inside diameter PVC pipe. The bottom end will be capped and wells perforated over the lower 30 to 60 cm. Wells will be screened with coarse sand over the perforated length. The surface will be sealed around each well to a minimum of 30-cm depth with bentonite clay chips to prevent surface infiltration.

Sampling – Task 3

Soil sampling to determine soil pH, ortho-phosphate, and organic matter content will be conducted at the time of site instrumentation. Each well will be monitored monthly for depth, recharge rate, nitrate content, redox potential, DOC, δ2H, and δ18O. After purging, groundwater samples from piezometers will be extracted using a peristaltic

pump with Tygon tubing. Samples will be collected in pre-labeled bottles and placed on ice until delivery to cold storage.

Twice in each year, four samples will be extracted from each site for analysis of diazinon to determine it presence above and below each site.

Chemical Analysis – Task 3

Samples will be shipped to a State-certified laboratory within 48 hours of sampling. Nitrate analysis will be conducted using ion chromatography or a spectroscopic auto-analyzer. Samples for isotopic analysis will be sent to the Center for Stable Isotope Biogeochemistry in the Department of Integrative Biology at U.C. Berkeley. Analysis of δ2H and δ18O in water will be done with a gas phase isotope ratio mass spectrometer (IRMS). Pesticide content will be determined by the enzyme-linked immunosorbant assay (ELISA) method specific for diazinon.

Evaluation of historic pesticide use on the restoration sites. – Task 4

A search of the Pesticide Use Reports, on file at the County Agriculture Commissioners office in each county, for each parcel will reveal the names and quantities of pesticides used on the parcel prior to restoration.

Clearly state how your approach will increase what is known about the ecosystem and how that knowledge may be applied in other systems, too. Explain how this information will be useful to people who make decisions about managing the ecosystem, and how it will be communicated to them and the ERP's implementing agencies.

This project will be the first of its kind in the Sacramento Valley. An understanding of the movement of soil water across a site that is also adjacent to the river channel will be of enormous use to land and water managers along the Sacramento River. This project will shed light on questions centering on the movement of upland soil water through riparian buffers and along with any contaminants or agricultural residues. The sampling design and the isotopic analyses of the water will also tell us much about how river water moves under the riparian zone. Results will be presented to the Sacramento River Conservation Area Forum and reported in a publication in an appropriate journal.

5. Feasibility – Show how your work is both feasible and appropriate for the proposed work and can be completed in the time allotted. Thoroughly address any contingencies or requirements such as dependence upon outcome or timing of other projects, or permitting processes.

As these are new methods of analysis, many more questions will likely be raised than are answered. However, the methodology used in this project will allow for evaluation of feasibility and show the way for next steps.

6. Expected Outcomes and Products

Deliverables:
Contour maps of depths-to-groundwater from the piezometers grids will be developed to discern groundwater gradients at each site. Similar contour maps will be developed for the other measured parameters. Isotopic ratios will provide further evidence of the sources of groundwater. Correlating the contour maps with nitrate concentration will be used to discern possible mitigation by the buffer system.

7. Data Handling, Storage, and Dissemination

Each year there will be a field day to present the study results to the Sacramento River Conservation Area Forum, industry, state and federal agencies, and regional non-profit personnel. An article documenting the research will also be submitted for peer-reviewed publication.

8. Public Involvement and Outreach

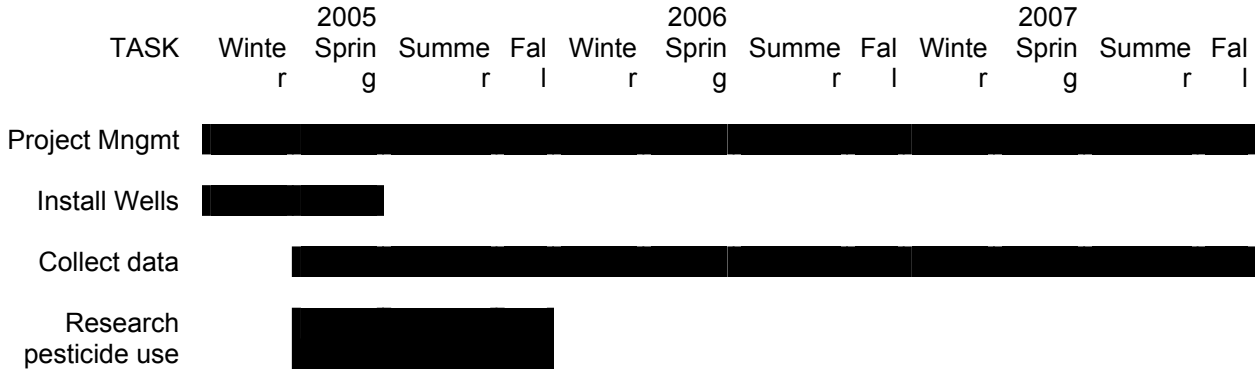
Proposals must describe a plan for public outreach to groups or individuals that may be informed by the project or affected by the restoration action(s) it monitors. This plan may include the reports and presentations that the project produces, local meetings, tours of restoration sites, or other local involvement in monitoring and evaluation activities.

Presentation of findings to Sacramento River Conservation Area Forum (SRCAF).

Write an article about findings from studies in the Chico Enterprise Record, Butte Environmental Council newsletter to highlight successful restoration resulting in improved water quality.

9. Work Schedule

Figure1. Implementation Timeline



B. Applicability to CALFED and CVPIA's goals.

1. ERP and CVPIA Priorities

ERP Goal 6 – Improve water quality in the system.
The results from this project will be useful as a first time monitoring for the Sacramento River of the effects of riparian vegetation of sub-surface water quality. We expect that the results will be useful for designing future larger-scale riparian water quality monitoring projects throughout the Central Valley.

2. Relationship to other Ecosystem Restoration actions, monitoring programs, or System-wide ecosystem benefits.

The restoration sites that will be sampled in this project were funded based upon ERP Goals 1 (at-risk species) and Goal 4 (Habitats).

3. Additional information for proposals containing land acquisition

No land acquisition in this proposal.

C. Qualifications

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

Tom Griggs – Senior Restoration Ecologist, River Partners. Dr. 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.

Lee S. Altier - Professor, College of Agriculture, California State University Chico.

Dr. Altier is an anthropology graduate from the University of Washington and a horticulture graduate from Washington State University (BS) and Cornell University (MS and Ph.D.). He has managed commercial farms in Washington State and New Mexico. As a Peace Corps Volunteer, he worked in agricultural extension with fruit farmers in Nepal for three years. From 1992 until 1995 he was a research horticulturist for the USDA-Agricultural Research Service at the Southeast Watershed Research Station in Tifton, Georgia. He coordinated an interdisciplinary team of researchers in the development of the Riparian Ecosystem Management Model (REMM). This simulation model has been applied worldwide for better understanding the dynamics of water quality control by riparian buffers. Currently, Dr. Altier is a professor in the College of Agriculture at California State University, Chico. He currently has research and

education projects in water quality management and farming systems in northern California and Thailand.

Explain how these participants provide the range of expertise in physical and environmental sciences or other disciplines needed to understand restoration outcomes and the associated ecosystem processes.

Tom Griggs' professional expertise lies in Riparian ecology and botany. Dr. Griggs personally planned and implemented several of the restoration units on the Sacramento River.

Lee Altier has experience with the physical ecology of water and nutrient movement in soils and riparian zones. Dr. Altier is familiar with local farming methods

E. Compliance with standard terms and conditions.

River Partners will comply with the terms and conditions as outline in Attachment 2 of the PSP.

F. Literature Cited

Dillaha, T.A., R.B. Reneau, S. Mostaghimi, and D. Lee. 1989. Vegetative filter strips for agricultural nonpoint source pollution control. Trans. ASAE 32:513-519.

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Hinkle, S.R., J.H. Duff, F.J. Triska. A. Laenen, E.B. Gates, K.E. Bencala, D.A. Wentz, and S.R. Silva. 2001. Linking hyporheic flow and nitrogen cycling near the Willamette River – a large river in Oregon, USA. J. Hydrol. 244:157-180.

Hubbard, Robert K; Sheridan, Joseph M; Lowrance, Richard; Bosch, David D; Vellidis, George. 2004. Fate of nitrogen from agriculture in the southeastern Coastal Plain. J. Soil Water Cons. 59:72.

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Lowrance, R.R., L.S. Altier, J.D. Newbold, R.R. Schnabel, P.M. Groffman, J.M. Denver, D.L. Correll, J.W. Gilliam, J.L. Robinson, R.B. Brinsfield, K.W. Staver, W.C. Lucas, and A.H. Todd. 1997. Water Quality Functions of Riparian Forest Buffers in Chesapeake Bay Watersheds. Environ. Mgmt. 21:687-712.

Lowrance, R.R., L.S. Altier, R.G. Williams, S.P. Inamdar. 2000. The Riparian Ecosystem Management Model. J. Soil Water Cons. 55:27.

Lowrance, R.R., R.L. Todd, and L.E. Asmussen. 1983. Waterborne nutrient budgets for the riparian zone of an agricultural watershed. Agric. Ecosys. Environ. 10:371-384.

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Nordmark, C. 1999. Preliminary results of acute and chronic toxicity testing of surface water monitored in the Sacramento River watershed, Winter 1998-99. Memorandum to Don Weaver, Environmental Hazards Assessment Program, Department of Pesticide Regulation, May, 1999. Accessed on Nov. 16, 2004 at URL http://www.cdpr.ca.gov/docs/empm/pubs/ehapreps/sw052699.pdf.

Nordmark, C.E., K.P. Bennett, H. Feng, J. Hernandez, and P. Lee. 1998. Occurrence of aquatic toxicity and dormant spray pesticide detection in the Sacramento River Watershed, Winter 1996–97: California Environmental Protection Agency, Department of Pesticide Regulation, Environmental Hazards Assessment Program, EH98-01, February 1998.

Peterjohn, W.T. and D.L. Correll. 1984. Nutrient dynamics in an agricultural watershed: Observations on the role of a riparian forest. Ecology 65:1466-1475.

Pinder, G.F. and S.P. Sauer. 1971. Numerical simulation of flood wave modification due to bank storage effects. Water Resour. Res. 7:63-70.

Sheridan, J.M., R. Lowrance, and D.D. Bosch. 1999. Management effects on runoff and sediment transport in riparian forest buffers. Transactions of the American Society of Agricultural Engineers 42:55-64.

H. Nonprofit verification

Internal Revenue Service

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

Date: October 6, 2003

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

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

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

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

Tasks And Deliverables

Sub−surface water quality monitoring on restored riparian sites along the middle Sacramento River

Task ID	Task Name	Start Month	End Month	Deliverables
1	Project Management	1	36	Semiannual and final reports. Periodic invoices
2	Installation of Monitoring Wells	1	6	Grids of monitoring wells installed at 3 sites
3	Collect and analyze water samples	6	36	Data on the concentration of nutrients and pesticides
4	Archival research of historic pesticide use	6	20	Pesticide use history for each sampling location

Comments

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

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
$34,086	$8,033	$365	$100	$295,722	$0	$0	$0	$338,306	$71,044	$409,350

Do you have cost share partners already identified?
No.

If yes, list partners and amount contributed by each:

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.

Sub−surface water quality monitoring on restored riparian sites along the middle Sacramento River

Sub−surface water quality monitoring on restored riparian sites along the middle Sacramento River

Year 1 (Months 1 To 12)

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)	**9745**	**2063**	**0**	**0**	**630**	**0**	**0**	**0**	$12,438	**2612**	$15,050
2: Installation of Monitoring Wells (6 months)	**0**	**0**	**0**	**0**	**26202**	**0**	**0**	**0**	$26,202	**5502**	$31,704
3: Collect and analyze water samples (7 months)	**0**	**0**	**0**	**0**	**85766**	**0**	**0**	**0**	$85,766	**18011**	$103,777
4: Archival research of historic pesticide use (7 months)	**3788**	**1268**	**365**	**100**	**0**	**0**	**0**	**0**	$5,521	**1159**	$6,680
Totals	**$13,533**	**$3,331**	**$365**	**$100**	**$112,598**	**$0**	**$0**	**$0**	**$129,927**	**$27,284**	**$157,211**

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)	**10095**	**2248**	**0**	**0**	**660**	**0**	**0**	**0**	$13,003	**2731**	$15,734
3: Collect and analyze water samples (12 months)	**0**	**0**	**0**	**0**	**90420**	**0**	**0**	**0**	$90,420	**18988**	$109,408
4: Archival research of historic	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	$0	**0**	$0

pesticide use (8 months)											
Totals	**$10,095**	**$2,248**	**$0**	**$0**	**$91,080**	**$0**	**$0**	**$0**	**$103,423**	**$21,719**	**$125,142**

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)	**10458**	**2454**	**0**	**0**	**600**	**0**	**0**	**0**	$13,512	**2838**	$16,350
3: Collect and analyze water samples (12 months)	**0**	**0**	**0**	**0**	**91444**	**0**	**0**	**0**	$91,444	**19203**	$110,647
Totals	**$10,458**	**$2,454**	**$0**	**$0**	**$92,044**	**$0**	**$0**	**$0**	**$104,956**	**$22,041**	**$126,997**

Budget Justification

Sub−surface water quality monitoring on restored riparian sites along the middle Sacramento River

Labor

Project Manager 40hrs. X $46/hr Year 1, Task 1 Senior Restoration Ecologist 200 hrs X $32/hr Year 1, Task 1 Senior Staff 20hrs.X $35/hr. Year 1, Task 1 Accounting 36hrs. X $24/hr. Year 1, Task 1 Biology Tech 250hrs. X $15/hr. Year 1, Task 1

Project Manager 40hrs. X $48/hr Year 2, Task 1 Senior Restoration Ecologist 200 hrs X $33/hr Year 2, Task 1 Senior Staff 20hrs.X $36/hr. Year 2, Task 1 Accounting 36hrs. X $25/hr. Year 2, Task 1

Project Manager 40hrs. X $50/hr Year 3, Task 1 Senior Restoration Ecologist 200 hrs X $34/hr Year 3, Task 1 Senior Staff 20hrs.X $38/hr. Year3, Task 1 Accounting 36hrs. X $26/hr. Year 3, Task 1

Benefits

Project Manager 17.22% Year 1 Senior Restoration Ecologist 27.53% Year 1 Senior Staff 17.82% Year1 Accounting 23% Year 1 Biology Tech 33.47% Year 1

Project Manager 17.83% Year 2 Senior Restoration Ecologist 29.04%Year 2 Senior Staff 18.43% Year 2 Accounting 23.94%. Year 2

Project Manager 18.51% Year 3 Senior Restoration Ecologist 30.69% Year 3 Senior Staff 19.11% Year3 Accounting 24.98% Year 3

Travel

Chico− Red Bluff 90miles round trip X 4 trips X $.55/ mile Chico−Willows 70miles round trip X 4 trips X $.55/mile Chico local trips 6 miles round trip X 4 trips X $.55/mile All trips will be to retrieve archived pesticide use reports (PUR) from county agricultural office. These trips will all be preformed under task 4.

Supplies And Expendables

Task 4 Printing. $100

Services And Consultants

River Partners will be contracting with California State University Chico. They will be providing contracted to provide services for Tasks 2 and 3. Yr1 Yr2 Yr3 Total PERSONNEL Salaries and wages Lee Altier: salary base: $78,696 Reimbursed Time − AY Overload 64 hrs x $ 57.86 + 3% each yr 3,703 3,814 3,929 11,446 Summer Salary 64 hrs x $57.86 3,703 3,814 3,929 11,446 Other Faculty:David Brown: salary base: 64,428 AY Overload: '05−'06 ~5 days− 40 hours 1,990 1,990 Undergraduate Students (1) − AY ($10/hr * 8hr * 12) 960 960 Summer − Technical Assistant −TBD AY: 20hrs/wk @ $20/hr * 32 wks 12,800 13,056 13,317 39,173 Summer: 12 wks * 20 hr/wk @ $20/hr 4,800 4,896 4,994 14,690 − Total Salaries and Wages 27,956 25,580 26,168 79,704 Fringe Benefits State @ 34% (faculty/staff reimbursed) − Foundation (part−time)@16%yr.1,17%yr.2 18%yr.3 4,319 4,349 4,710 13,378 Student AY 6% yr.l, 8% yr. 3 58 58 Total Fringe Benefits 4,377 4,349 4,710 13,436 Total Personnel Expenses 32,333 29,929 30,878 93,140 OPERATING EXPENSES Office Supplies − Printing &Copying 200 200 200 600 Postage/Overnight (shipping samples: 13 * $25) 325 350 300 975 Pumping supplies 200 200 200 600 Sensor calibration solutions 748 796 700 2,244 Sonde maintenance kit 175 175 350 Pipe, screens, caps for wells 4,500 4,500 Lab Supplies(sampling bottles:$0.50*16*11*3) 270 294 294 858 Total Operating Expenses 6,243 2,015 1,869 10,127 Travel In−State Travel Mileage @ .375/mi. * 40 trips * 100 miles 1500 1500 1500 4,500 Total Travel 1,500 1,500 1,500

4,500 PROPERTY/EQUIPMENT Property/Equipment – ––water level indicator 550 550 ––perastaltic pump 1,200 1,200 ––PDA controller for sonde 1,995 1,995 Equipment Purchase – –multi–parameter sonde with case, 6,055 6,055 warranty Computer Equipment: laptop 1,500 1,500 Total Equipment 11,300 – – 11,300 MISCELLANEOUS EXPENSES TBD–Chemical Analysis 3,168 3,168 3,168 9,504 (NO3: $6 * 16 samples* 3 sites * 11 times) UC Berkeley–Chemical Analysis 3,168 3,168 3,168 9,504 (DOC: $6 * 16 samples* 3 sites * 11 times) TBD–Chemical Analysis 33,000 33,000 33,000 99,000 (d2H and d18O: 11 times * ($40 * 25 samples * 3 sites)) TBD–Chemical Analysis 3,120 3,120 3,120 9,360(Diazinon: 4 samples * 3 sites* 2 times/yr @ $130/sample) Nitrate sensor 350 350 Poly cable 25' 251 251 Total Miscellaneous 42,456 42,456 42,456 127,368 TOTAL DIRECT COSTS 93,832 75,900 76,703 246,435 INDIRECT COSTS – 20% of Total Direct Costs 18,766 15,180 15,341 49,287 TOTAL PROJECT COSTS 112,598 91,080 92,044 295,722

Equipment

None

Lands And Rights Of Way

None

Other Direct Costs

None

Indirect Costs/Overhead

River Partners overhead rate averages 21% yearly. This is the same rate that we are using on our existing CalFed grants.

Comments

Environmental Compliance

Sub−surface water quality monitoring on restored riparian sites along the middle Sacramento River

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.

US Fish &Wildlife Service, Sacramento Refuge Complex, Willows, 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	–	–	
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

Sub−surface water quality monitoring on restored riparian sites along the middle Sacramento River

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?
X 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.