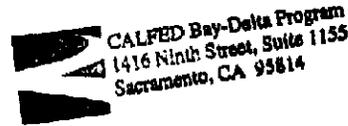




Sacramento
Area Flood
Control
Agency

July 28, 1997

JUL 28 1997



Ms. Kate Hansel
CALFED Bay-Delta Program
1416 Ninth Street, Suite 1155
Sacramento, CA 95814

Subject: Proposals to Establish Comprehensive Management Program and Four
Habitat Demonstration Projects for the Lower American River Ecosystem

Dear Ms. Hansel:

The lower American River (LAR) ecosystem encompasses highly valued and biologically diverse aquatic and terrestrial resources. Many organizations are actively working to protect and enhance the ecosystem. Recent coordination among stakeholders has identified SAFCA's Floodway Management Plan and the Draft Water Forum Agreement as the central programs for helping to ensure the long-term viability of the LAR ecosystem. The Floodway Management Plan and the Habitat Mitigation Element of the Draft Water Forum Agreement have become the focus of the coordinated effort among the stakeholders.

SAFCA, with the support of the Water Forum and other LAR stakeholders, proposes a comprehensive management program for habitat management and monitoring of the LAR, consistent with the above plans. The program would consolidate and coordinate overall LAR habitat and species monitoring, and implement four demonstration habitat enhancement projects identified as high priority targets for the LAR ecosystem. The program would also establish a Technical Assistance Team representing the broad interests of the stakeholders, and serve as a peer review body and as a clearinghouse for information on the success of habitat studies and enhancement projects.

The proposed program for coordinating LAR management efforts would optimize investments in ecosystem enhancements, ensure efficiency in scientific research, and promote communications among the stakeholders towards the common goal of ecosystem protection. A key feature of the program is the coordination of project-level monitoring, such as the four proposed demonstration projects (submitted separately) and other ongoing projects. The information on overall ecosystem health and habitat project successes would be evaluated with data on species population monitoring and other ecosystem function to make cost-effective management decisions on future ecosystem investments.

Office 916-440-7606
FAX 916-440-8289

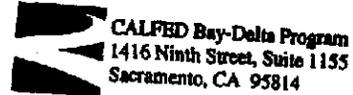
1007 - 7th Street, 5th Floor
Sacramento, CA 95814-3407

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Ms. Kate Hansel
July 28, 1997
Page Two

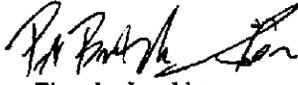


The four demonstration projects proposed would provide needed information on the feasibility of habitat enhancements for priority aquatic species. The key objectives of the four demonstration projects are:

- restore and evaluate unique steelhead and splittail habitat;
- restore and protect shaded riverine aquatic habitat and wetland-slough complex habitat;
- promote establishment of vegetation in a highly scoured zone; and
- demonstration of an alternative bank protection method.

The Sacramento Area Water Forum, representing 46 stakeholders, the City/County Office of Metropolitan Water Planning, and the LAR Task Force which is comprised of 8 Community Groups, 6 Environmental Interests, 2 Recreation Interests, 8 Flood Control Agencies, and 3 Resource Agencies (*see attached Statement of Support*). This demonstration project is consistent with the objectives of CALFED and the goals of other ongoing projects. The AFRP recommends developing a riparian corridor management plan. The Lower American River Technical Team endorses restoration of wetland-slough complexes and riparian habitats along levees in the lower portion of the LAR, and management and restoration of large woody debris, especially in the upper reaches of the LAR.

Sincerely,



Timothy Washburn
Agency Counsel

I. EXECUTIVE SUMMARY

a. Project Title and Applicant Name:

Shaded Riverine Aquatic (SRA) Habitat/Instream Cover Demonstration Project
 Sacramento Area Flood Control Agency
 Timothy N. Washburn, Agency Counsel
 1007 7th Street, 5th Floor Phone: (916) 440-7606
 Sacramento, CA 95814 Fax: (916) 440-8289

b. Project Description and Primary Biological/Ecological Objectives: Sacramento Area Flood Control Agency (SAFCA), the Sacramento Area Water Forum, and other American River stakeholders have joined together to offer this proposal for a demonstration project to restore shaded riverine aquatic (SRA) habitat and instream aquatic cover. A primary benefit of the proposed project is the creation of SRA habitat and instream cover and habitat for priority fish species including steelhead and splittail.

c. Approach/Tasks/Schedule: The preliminary design phase of the project was completed in the first half of 1997. Task 1 and 2 of the project, permitting and site-specific construction design, will be completed in fall of 1997. Tasks 3 and 4, development of a monitoring plan and construction, can be completed from late fall 1997 through summer 1998. A final construction report will be available by fall 1998. Task 5, monitoring and evaluation, will begin following completion of construction. Annual monitoring reports will be submitted in 1999, 2000, and 2001. Task 6, refinement of the prototype design, will be completed in 2000. Task 7, progress reports, will be ongoing during the years funded by CALFED; i.e., 1997-2000. Task 8, operation and maintenance, including long-term monitoring, will be the responsibility of SAFCA, and will be completed in 2007.

d. Justification for Project and Funding by CALFED: Changes in the geomorphology of the floodplain, stream channel and streamflow of the Lower American River (LAR) have led to a reduction in riparian and SRA habitat. The project site is currently devoid of SRA habitat, and the uniformity of near-shore gradients and substrate, and lack of herbaceous and woody cover suggest that creation of this combination of instream and SRA habitat would be especially beneficial. The project is located to provide the maximum benefit to juvenile steelhead. Additionally, the habitat value of the site will be increased by the addition of SRA habitat, instream cover, habitat complexity, and hydraulic diversity.

This is a new SAFCA project which has potential application Delta-wide. The project is intended to demonstrate a technique to create durable, permanent instream habitat for steelhead, splittail, and chinook salmon. The SAFCA board has approved this grant proposal, and indicated that SAFCA will assume responsibility for operation and maintenance of the project.

e. Budget Costs and Third Party Impacts: The total budget costs are \$447,205 according to the following tasks:

Task 1 \$11,500	Task 5 \$216,200
Task 2 \$27,600	Task 6 \$5,750
Task 3 \$3,450	Task 7 \$0
Task 4 \$74,550	Task 8 \$57,500

Third-Party Impacts: Third party impacts, although expected to be minimal, would be evaluated during the environmental review process, including potential impacts to plant and animal communities, recreation, and cultural resources.

f. Applicant Qualifications: SAFCA is the Project Sponsor. SAFCA and the Water Forum have assembled a team of resource consultants to conduct the proposed study. Swanson Hydrology and Geomorphology, H.A.R.T., Inc., and Surface Water Resources, Inc. (SWRI) are proposed to implement the project. Swanson Hydrology and Geomorphology was selected as the SAFCA consultant for their expertise in designing the project and their expertise in fluvial geomorphology. H.A.R.T. was selected as the SAFCA consultant for vegetation monitoring because of their experience in designing the vegetative components of this project, and their demonstrated experience with this type of habitat restoration. SWRI was selected as SAFCA consultants to conduct the fisheries monitoring for this project because of their extensive individual and corporate experience in ecological resources issues, particularly aquatic issues, and planning processes in the lower American River, the Central Valley, and the Bay-Delta.

Project Management - Timothy Washburn, Agency Counsel
Project Management & Design - Mitchell Swanson, Ph.D., Senior Fluvial Geomorphologist
Vegetation Monitoring - Jeffrey Hart, Ph.D., Restoration Ecologist
Aquatic Monitoring & Sampling Design - Paul Bratovich, M.S., Senior Scientist
Aquatic Monitoring & Sampling Design - Mike Bryan, Ph.D., Aquatic Ecologist
Hydraulic Modeling - George "Buzz" Link, P.E., Senior Water Resources Engineer

g. Monitoring and Data Evaluation: Monitoring objectives include: 1) Assessing the use of the habitat by priority fish species; 2) documenting success of planting efforts; 3) documentation of changes in vegetative density and structure and relate these to observations of erosion and deposition; 4) identifying trends in erosion or deposition at permanent transects and on the platform and compare these trends to changes in control transects; and 5) assessing physical integrity of platforms, and identify design/construction improvements for use at other sites. Monitoring data pertaining to the parameters identified above will be analyzed statistically, as appropriate, to determine differences among treatments and differences between improved and unimproved sites.

h. Local Support/Coordination with other Programs/ Compatibility with CALFED objectives: The Sacramento Area Water Forum, represents 46 stakeholders, the City/County Office of Metropolitan Water Planning, and the LAR Task Force which is comprised of 8 Community Groups, 6 Environmental Interests, 2 Recreation Interests, 8 Flood Control Agencies, and 3 Resource Agencies (*see attached Statement of Support*): This demonstration project is consistent with the objectives of CALFED and the goals of other ongoing projects. The AFRP recommends developing a riparian corridor management plan. The Lower American River Technical Team endorses restoration of wetland-slough complexes and riparian habitats along levees in the lower portion of the LAR, and management and restoration of large woody debris, especially in the upper reaches of the LAR.

II. TITLE PAGE

a. Title of Project: Shaded Riverine Aquatic (SRA) Habitat/Instream Cover Demonstration Project

b. Name of applicant(s): Sacramento Area Flood Control Agency

Principle investigator(s):

Mitchell Swanson
Fluvial Geomorphologist
Swanson Hydrology and Geomorphology
519 Seabright Avenue, Suite 210
Santa Cruz, California 95062
Phone: (408) 427-0288
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Jeffrey Hart, Ph.D.
Senior Ecologist
H.A.R.T., Inc.
1547 33rd Street
Sacramento, CA 95816
Phone: (916) 451-6679
Fax: (916) 451-1153

c. Type of Organization and Tax Status: Joint Powers Agency, IRS Exempt

d. Tax Identification Number: 94-6000529

e. Technical and Financial Contact person(s):

Financial Contact Person

Julie Lienert
Director of Administration, SAFCA
1007 7th Street, 5th floor
Sacramento, CA 95814
Phone: (916) 440-7607
Fax: (916) 440-8289

Technical Contact Person

Timothy N. Washburn
Agency Counsel, SAFCA
1007 7th Street, 5th Floor
Sacramento, CA 95814
Phone: (916) 440-7607
Fax: (916) 440-8289

f. Participants/Collaborators in Implementation: The Sacramento Area Water Forum, representing 46 stakeholders, the City/County Office of Metropolitan Water Planning, and the LAR Task Force which is comprised of 8 Community Groups, 6 Environmental Interests, 2 Recreation Interests, 8 Flood Control Agencies, and 3 Resource Agencies (*see attached Statement of Support*):

g. RFP Project Group Type - Public Works Construction Projects

III. PROJECT DESCRIPTION

a. Project Description and Approach

Sacramento Area Flood Control Agency (SAFCA), with the participation of the Water Forum (representing more than 40 stakeholders in the Sacramento area from the business community, environmental interests, public interests, Sacramento water interests, and foothill water interests), the Lower American River Task Force (see the attached Statement of Support from Task Force participants), and the Lower American River Technical Team, has developed five proposals to CALFED, including a Comprehensive Habitat Management Program and several habitat restoration projects. These projects are part of an ongoing effort in the American River to develop a program which provides the optimum protection of the LAR ecosystem, particularly aquatic natural resources, and to coordinate these efforts with a diverse group of stakeholders. Many of the planning, permitting, and monitoring and evaluation activities of these proposals will be combined among the projects for maximum efficiency and effectiveness. This proposal to create shaded riverine aquatic (SRA) habitat and instream cover at Goethe Park is one of four proposed habitat restoration projects.

A demonstration project is proposed for the lower American River to further study and refine a prototype riparian platform which mimics natural aquatic-wetland-riparian habitat gradients, increases habitat and topographic complexity, and provides instream cover habitat for priority fish species. The creation of shaded riverine aquatic habitat will enhance diversity of instream aquatic habitat. The platforms will also increase hydraulic roughness, potentially reducing erosion and increasing sediment deposition at the site. This demonstration project will be extensively monitored to assess wide-scale applicability, to propose design improvements, and to document benefits to priority species such as steelhead and splittail. The design, based on natural analogs, includes the installation of instream "boulder-cluster riparian platforms" on the left bank of the American River (near River Mile 14). A cross section and plan view of a typical cluster are attached. These clusters form a ring of rocks extending out from the bank with backfill of native material spread over the berm and revegetated. The prototype has potential wide-scale applicability to create aquatic and terrestrial habitat complexity between a river channels and levees.

The boulder-cluster riparian platform has been specifically designed in several respects to provide habitat for priority fish species, including steelhead and splittail. Rounded boulders, 3-4 feet in diameter, will be placed near the downstream end of the platform (see attached figures). Post-emergent steelhead fry typically use shallow, slow-moving littoral zone habitats. As steelhead grow, they move into deeper, faster water. Because oversummering juvenile steelhead are most frequently observed in the American River in relatively fast-flowing areas characterized by hydraulic roughness elements which provide non-uniform, semi-turbulent flow characteristics (B. Snider, CDFG, pers. comm. 1997; P. Bratovich, pers. comm., 1997), incorporating boulders in the platform will increase the hydraulic diversity of the areas and increase habitat value for juvenile steelhead. It is anticipated that the addition of boulder clusters would also provide refuge for juvenile fish during high flows, including splittail, steelhead, and chinook salmon. The platforms also will provide shaded riverine aquatic cover, which provides additional instream habitat for juvenile fish. The use of herbaceous cover, gravel and woody debris at the tail of the platform will provide feeding habitat for post-emergent fry.

The attached figure shows the plan view, cross-section and longitudinal profiles of the riparian platform. The basic concept is to create a structure which ties into the existing bank and projects 10-20 feet out into

the existing channel. The upstream and river sides of the structure would be formed of rock. Those portions which would be routinely submerged will be formed of an "open" composition of 0.5-2.0 foot diameter rock. Near the top of the structure, the size range will extend into the gravel range. The backside of the structure will have a 6-inch thick small-coarse gravel filter to minimize the loss of fine sediments from the native materials used to backfill the structure. Those portions of the platform directly exposed to flow will have a maximum slope of no greater than 1.5(H):1(V), and will be "keyed" below the existing bed to prevent toe-failure and accommodate normal scour-hole development caused by flow separation effects near the tail of the platform.

Fill for the structure will be obtained through the minor amount of excavation needed to accommodate heavy equipment access. Fill will conform to existing gradeline on the bank at the lower extent of existing riparian vegetation at the upstream edge of the platform, and have a 2 percent outslope away from the bank. The top of the platform will slope down in a downstream direction such that, in profile, the platform forms a wedge which diminishes to zero at the tail of the platform. Boulders 3-4 feet in diameter will be placed near the edge of the platform.

Hydrologic Modeling: A critical component of boulder placement and vegetation planting is elevation. To benefit post-emergent steelhead fry, instream cover elements should be located such that they are in littoral zone areas over a range of flows which typically occur from February through June. To benefit oversummering steelhead, instream cover elements should be placed such that they are available in deeper, faster areas utilized by juvenile steelhead at the range of flows that typically occurs from July through September. As discussed previously, plantings will be placed at appropriate inundation levels.

To determine appropriate elevations for the placement of instream objects and vegetation inundation, stage discharge relationships for the LAR (in the vicinity of the project site) will be evaluated for the 70-year hydrologic period of record. Discharge records will be examined for the February through June and July through September periods to determine the average stage (i.e., elevation) that occurs during these periods. The typical variation in stage among years also will be determined for each period. Understanding the river's seasonal stage-discharge relationships will facilitate placement of the plantings and boulders in locations that will be most beneficial to juvenile steelhead over a range of flows.

Planting Methods: The surface of the platform will be composed of native fill will be revegetated using a variety of endemic woody riparian and herbaceous wetland species to form a vegetative gradient that follows the topography of the platform. The highest portions at the upstream end will be largely composed of 1.5-3 inch diameter pole plantings of alder and cottonwood. The mid-elevation zone would be composed of a mix of sandbar willow and carex and juncus, while the lowest portion would be comprised primarily of carex and juncus. These zones will have gradual boundaries and the broad mix of species will allow for a natural sorting process so that vegetative success can be attained within a broad range of flow regimes following initial installation. Revegetation will be combined with cover of cobble, gravel, and/or coir (coconut fabric) to protect the platform surface from scour. The outside edge of the platform down to the normal median summer water level will be planted with sandbar willow poles. This species can tolerate sustained inundation and will provide overhanging vegetation.

Construction Methods: The platform will be constructed during low water conditions using an excavator with a 3-4 foot wide bucket to excavate the keyway, place the rock, and backfilled with native material excavated from the bank. Access along the lower bank will require some excavation of the upper bank,

and any excess material generated during this process will be placed and spread on the berm and revegetated. Rock to form structures will be imported and end-dumped at the edge of the bluff for use by the excavator.

b. Location and/or Geographic Boundaries of the Project

The project site is located near River Mile 14 on the lower American River at Goethe Park, in Sacramento County.

c. Expected Benefit(s)

A primary benefit of the proposed project is the creation of SRA habitat and instream cover, and habitat for priority fish species including steelhead and splittail. These habitats provide resting and feeding areas for juvenile fish. Boulders provide some degree of velocity refuge in high flows, as well as hydraulic diversity and escape cover at lower flows. The primary stressors addressed by the project include loss of shallow water habitat, degradation of instream habitat conditions, and loss of lotic conditions. A secondary benefit of the project will be the potential for increasing sediment and spawning gravel recruitment through encouraging deposition of materials due to increased hydraulic roughness.

Since the platform mimics natural aquatic-wetland-riparian habitat gradients, it can serve to provide the type of microhabitat diversity which has often been eliminated through floodway improvements. The platforms serve to substantially broaden the width of these habitat zones, increase their lineal extent, and to break up the continuity of the shore zone, increasing habitat complexity. The project has long-term benefits in terms of habitat creation.

Further benefits of the proposed project include benefits to secondary priority species, including migratory birds, through the restoration of riparian and SRA habitat. As a demonstration project, the project could benefit aquatic and terrestrial species and habitats at other locations in the American River and in the Delta by introducing a form of habitat restoration that is compatible with flood control.

d. Background and Biological/Technical Justification

Changes in the geomorphology of the floodplain, stream channel and streamflow of the LAR have led to a reduction in riparian and SRA habitat. The project site is currently devoid of SRA habitat, and the uniformity of near-shore gradients and substrate, and lack of herbaceous and woody cover suggest that creation of this combination of instream and SRA habitat would be especially beneficial. The project is located to provide the maximum benefit to juvenile steelhead. Most steelhead spawning occurs in the upper reaches of the LAR; thus, the project site will be available to post-emergent fry. Additionally, the habitat value of the site will be increased by the addition of SRA habitat, instream cover, habitat complexity, and hydraulic diversity.

This is a new SAFCA project which has potential application Delta-wide. The project is intended to demonstrate a technique to create durable, permanent instream habitat for steelhead, splittail, and chinook salmon. Progress to date includes location of a suitable project site, development of preliminary designs, and soliciting feedback from the Lower American River Technical Team and the Lower American River Task Force. This grant proposal has been approved by the SAFCA board.

e. Proposed Scope of Work

Task 1: Pre-Construction Approvals. Initiate all permitting processes required prior to construction and project implementation. Initiation of the permitting process, in coordination with the Lower American River Task Force and other stakeholders, will serve to define any remaining design issues and informational needs. This task will take place in conjunction with other tasks during the early stages of the project until all the data necessary to obtain permits has been generated and all the appropriate construction approvals are awarded. This task will be scheduled to avoid delays in construction and implementation.

Deliverable(s) of this task: Memorandum providing confirmation of construction approvals.

Task 2: Site-Specific Construction Design. Evaluation of hydrologic modeling results for the 70-year period of record, including stage-discharge relationships presented by month. The hydrologic modeling results will be used to determine placement of boulders and vegetation. Preparation of a base topographic map, grading plans, construction specifications and planting schematics are also a part of this task.

Deliverable(s) of this task: Final Design Report.

Task 3: Monitoring Plan. Based on the site specific construction design and hydraulic modeling results, prepare a project monitoring plan to collect data on: 1) fishery habitat and use; 2) performance of the platforms (identification of potential improvements); 3) platform durability; 4) erosion patterns; and 5) planting success.

Deliverable(s) for this task: Monitoring Plan.

Task 4: Construction. This task will include solicitation of construction bids, construction staking, actual construction, inspection, and preparation of as-built drawings. Deliverable(s) for this task: Final Construction Report.

Task 5: Monitoring and Data Collection and Evaluation. Monitoring and data collection will be carried out following project construction in accordance with the Monitoring Plan developed in Task 3. Further discussion on monitoring and data collection activities is described in Section f which follows this scope of work.

Deliverable(s) for this task: Annual monitoring reports.

Task 6: Refinement of Prototype Design. After evaluating data collected during the first two years of monitoring activities, a report discussing findings/results of demonstration will be prepared. As a part of the findings, a section discussing potential design improvements of the platform prototype will be prepared.

Deliverable(s) for this task: Final Results and Findings, and Prototype Design Enhancement Report.

Task 7: Progress Reports. As part of invoicing activities, progress reports will be prepared, describing key activities performed and deliverables submitted during the invoicing period. Included in these reports will be financial statements describing funds spent and remaining.

Deliverable(s) for this task: Progress Reports.

Task 8: Operation and Maintenance. Removal of invasive, exotic vegetation will continue until native species are established. Long-term monitoring will be performed after the first two years of the project as described in section f.

f. Monitoring and Data Evaluation

Extensive monitoring will be performed during the first two years following construction, and long-term monitoring will be conducted at years 3-5, 7, and 10 following construction. Monitoring objectives include:

1. Assess use of the habitat by priority fish species.
2. Document success of planting efforts.
3. Document changes in vegetative density and structure and relate these to observations of erosion and deposition.
4. Identify trends in erosion or deposition at permanent transects and on the platform and compare these trends to changes in control transects.
5. Assess physical integrity of platforms, and identify design/construction improvements for use at other sites.

Monitoring data pertaining to the parameters identified above will be analyzed statistically, as appropriate, to determine differences among treatments and differences between improved and unimproved sites.

Fish Habitat Use: Relative abundance of juvenile steelhead and splittail using improved littoral zone habitats will be compared to the relative abundance of these species at unimproved sites using ANOVA procedures on log-transformed catch-per-unit-effort data.

Vegetation: Average rates of survival for each of the plant species used in the restoration will be determined for specified intervals throughout the monitoring program. Standard quadrat techniques will be employed to determine species-specific densities, which will be compared to densities at the time of planting to calculate interval survival rates (in percent). Following the appropriate transformation of percent data (i.e., arcsin, square root), species-specific interval survival rates will be compared among treatments using analysis of variance (ANOVA) procedures. Plant cover, the proportion of an area covered by the vertical projection of plant crowns or basal area to the riverbed, also will be monitored using one or more standard methods (e.g., the Braun-Blanquet cover abundance scale, line intercept, or point intercept) and compared to a control site.

Physical Site Characteristics: The site will be equipped with a permanent staff gage in order to document stage and flow conditions during individual site visits and to develop depth-duration curves based on stream flows at the USGS "American River at Fair Oaks" stream gage. This data will allow an evaluation of plant responses to depth and duration of inundation and erosive velocities.

Permanent transects will be established at 10-foot intervals beginning 20 feet in front of each platform and extending 20 feet beyond the downstream tail. These transects will be surveyed prior to construction, after construction, and annually in September-October. Subsequent surveys will be "overlaid" in order to document area and extent of erosion and deposition. Changes in channel substrate will be documented using suitable methods characterizing the substrate within a 2-ft zone surrounding established points. A topographic map of the platform itself will be mapped each year during low water. "Relative change" 0.1 foot contour lines will be prepared to compare both year-to-year and cumulative changes since construction. This will allow an examination of the platform's tendency to erode or receive deposition over time.

Site visits would be made during the high flow season to assess vegetative performance and any ongoing processes of erosion and deposition, as well as to provide photo and video documentation. Flow velocity measurements would be performed both prior to construction and during these visits at 1-2 foot intervals extending from the water's edge to maximum wadable depths. Similar year-to-year and cumulative-since-construction changes in velocity distributions would be prepared.

Differences in habitat complexity will be evaluated based on changes in plant cover, density, and hydraulic complexity. Hydraulic complexity will be determined by measuring current velocities at specified intervals along multiple line transects running perpendicular to shore. This will be conducted within multiple plots for each treatment. Locations for these transects will be determined using randomization procedures.

g. Implementability

The proposed demonstration project will be constructed on Sacramento County-owned property in the Lower American River Parkway. The project has direct ties to ongoing bank protection projects on the lower American River (SAFCA, Corps, DWR, American River Flood Control District, CDFG and USFWS) and the support of the Lower American River Task Force. Environmental review and permitting will be completed by SAFCA.

Because the project involves construction within the active stream channel of the American River and activities within the County Parks system, various permits from County, State, and Federal resource management agencies will be required, as well as compliance with CEQA and NEPA. In the event that steelhead are listed under the Endangered Species Act (ESA) by NMFS, habitat modifications and monitoring of steelhead would require Section 10 ESA permits. Streambed alteration agreements will be required from CDFG. Cultural resources surveys will need to be conducted. Activity permits will also be required from County Parks, as the entire project is on County Park lands.

The project is considered to have low sensitivity to changes in hydraulic conditions. The platform mass is sufficiently large to prevent direct structural failure. Potential toe failure (undercutting of the toe, thereby allowing the rock and fill to slump into the river) will be mitigated through an appropriately-designed "key" extending below the existing streambed. The platform fill will be initially exposed to erosion. This will be mitigated through a combination of methods including placement of cobble and gravel, planting with plugs of herbaceous vegetation, and protecting the surface with coir landscape fabric. Once the platform surface gains hydraulic roughness, deposition is expected to increase, which could lengthen the platform over time. Increasing root mass will further increase the structural stability.

IV. COSTS AND SCHEDULE TO IMPLEMENT PROPOSED PROJECT

a. Budget Costs

See attached cost tables

SAFCA is proposing to cost-share the demonstration project as part of ongoing and planned habitat restoration programs in the lower American River.

The LAR stakeholder group including SAFCA, the Water Forum, and City and County organizations such as county parks have the infrastructure and long-term mandate to protect and enhance natural habitats of the LAR floodplain. Existing operation and maintenance activities designated for floodplain upkeep including levee maintenance and wetland and riparian vegetation protection are presently funded by these organizations under an ongoing floodway management program. Any habitats and lands restored in the floodplain will be maintained in the future by these organizations.

SAFCA and the Water Forum have dedicated funds to match CALFED and CVPIA funds for habitat restoration in the LAR including the proposed project. A primary objective of the CVPIA-AFRP is to improve habitat not only through improved flows (where most of their emphasis has been to date) but through improved physical habitat. Though no CVPIA funds to date have been allocated for physical habitat in the LAR, our stakeholder group intends to solicit their funding of habitat restoration projects in the LAR.

b. Schedule Milestones

The preliminary design phase of the project was completed in the first half of 1997. Task 1 and 2 of the project, permitting and site-specific construction design, will be completed in fall of 1997. Tasks 3 and 4, development of a monitoring plan and construction, can be completed from late fall 1997 through summer 1998. A final construction report will be available by fall 1998. Task 5, monitoring and evaluation, will begin following completion of construction. Annual monitoring reports will be submitted in 1999, 2000, and 2001. Task 6, refinement of the prototype design, will be completed in 2000. Task 7, progress reports, will be ongoing during the years funded by CALFED; i.e., 1997-2000. Task 8, operation and maintenance, including long-term monitoring, will be the responsibility of SAFCA, and will be completed in 2007.

c. Third Party Impacts

Third party impacts, although expected to be minimal, would be evaluated during the environmental review process, including potential impacts to plant and animal communities, recreationists, and cultural resources.

As part of the proposed Comprehensive Habitat Management Program and associated habitat restoration projects, SAFCA will use the Corps of Engineers' new hydraulic model of the river to evaluate the compatibility of habitat restoration projects with flood control objectives. Future vegetation management and proposed habitat restoration or mitigation projects will be evaluated based on hydraulic modeling verification of site-specific or reach-by-reach floodway standards. Hydraulic model results will confirm

that habitat expansion projects are not in conflict with public safety thresholds (e.g., adequate freeboard, avoidance of seepage risk, levee protection). Model results will also be used to identify sites where surplus channel capacity exists, and thereby identify suitable sites for habitat restoration projects, or to recommend altered or reduced channel maintenance procedures (e.g., vegetation removal) to promote greater aquatic and riparian habitat quality at the sites.

Composite channel roughness coefficients will be developed at the riparian platform location to compare existing conditions with floodway design standards and proposed habitat modifications. Standardized criteria will be developed to support acceptance, rejection, or design modification of proposals to meet ecosystem and floodway objectives.

V. APPLICANT QUALIFICATIONS

SAFCA/Water Forum have assembled a team of resource consultants to conduct the proposed study. The project team does not have any conflicts of interests. A support management team consisting of SAFCA staff and its technical advisors (Swanson Hydrology and Geomorphology, H.A.R.T, Inc., Surface Water Resources, Inc.) will work with the Technical Assistance Team and LAR Task Force on final design of project features and deliverables. The management team and primary project roles are shown below:

Timothy Washburn	Project Manager
Mitchell Swanson	Hydraulic Design and Monitoring
Toby Hanes	Hydraulic Design and Monitoring
Jeffrey Hart	Terrestrial Habitat Design and Monitoring
Paul Bratovich	Aquatic Habitat Design and Monitoring
Amy Harris	Aquatic Monitoring and Endangered Species
George "Buzz" Link	Hydrologic Modeling
Rick Lind	Environmental Compliance and Regulatory Permitting

TIMOTHY WASHBURN is the General Counsel for the Sacramento Area Flood Control Agency with responsibility for planning and environmental review of regional flood control projects, supervision of consulting engineers, biologists, and associate counsels in preparation of project reports and related documents. Other activities include coordination of planning activities with the U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, State Reclamation Board, State Department of Water Resources, State Department of Fish and Game, State Historic Preservation Officer, City of Sacramento, County of Sacramento, County of Sutter, Reclamation District 1000, and the American River Flood Control District. Notable projects include the American River Watershed Investigation, Natomas Area Flood Control Improvement Project, Natomas Basin Habitat Conservation Plan, and Interim Reoperation of Folsom Dam and Reservoir.

MITCHELL SWANSON is a senior fluvial geomorphologist with over 15 years of consulting experience related to restoration and resource management of large rivers, streams, and wetlands. He holds B.S. and M.S. degrees in earth sciences, with concentrations in fluvial geomorphology, sedimentary geology, and hydrology. He specializes in the development of technically and environmentally sound management and restoration plans for rivers and watersheds. A special focus involves the development of systematic field data collection and analysis programs tailored to the specific needs and resources of the individual project. His technical expertise includes historical geomorphic and hydrology studies, and in determining the causes and effects of human modification on natural systems. Mr. Swanson has led efforts to integrate bioengineering and geomorphic principles into bank and stream stabilization projects. Mr. Swanson has become a recognized expert in conflict resolution between government agencies and public and private interests. Past project activities include streambed stability assessment, historical analysis, development of geomorphic and riparian vegetation design criteria for bioengineered structures, and design of aquatic enhancements.

TOBY HANES is a registered professional hydrologist and certified professional erosion and sediment control specialist with 21 years of experience. He holds a B.S. in watershed sciences and an M.S. in wildland hydrology with academic concentration in natural channel hydraulics and sediment transport, physical process watershed modeling, and soil-plant-water relationships. Mr. Hanes' career includes

positions as a field hydrologist with the U.S. Geological Survey and 13 years with the U.S. Forest Service, with positions at all levels of the agency from District Ranger to the Washington, D.C. office. Pertinent experience includes five years as a Forest Hydrologist at the Lake Tahoe Basin Management Unit, where he was directly responsible for a number of stream and wetland restoration projects. For the last nine years, Mr. Hanes has been in private consulting and established Hydro Science in 1990. Mr. Hanes has designed and supervised construction on numerous stream and wetland restoration projects and has had two on-call service contracts with the California Tahoe Conservancy to provide such services.

JEFFREY A. HART has had considerable success in designing and implementing restoration projects (e.g., Stone Lakes National Wildlife Refuge), biotechnical projects (e.g., Dry Creek, Lower American River), and resource studies (e.g., Cosumnes River, Lower American River). His clients include government agencies and non-profit organizations such as the Sacramento Area Flood Control Agency, Sacramento County Water Resources Division, Ducks Unlimited, and the Nature Conservancy. Hart has successfully completed restoration contracts with Ducks Unlimited, and has made considerable progress with CalTrans Beach Lake Mitigation site.

PAUL M. BRATOVICH has worked as a fisheries consultant and water resources specialist in California for the past 14 years. As a recognized fisheries expert of Central Valley streams and the Bay/Delta, with particular expertise on the American River, he is actively participating in a broad range of forums in a variety of consultative, advisory, and technical expert capacities. For example, Mr. Bratovich is presently serving as a lead consultant to the Sacramento Area Water Forum on behalf of the joint Sacramento City-County Office of Metropolitan Water Planning. As a fisheries expert on the Bay/Delta Oversight Council, Mr. Bratovich served on both the Aquatic Resources Technical Advisory Committee and on the Lower Sacramento River and Delta Tributaries Technical Team, as part of the Anadromous Fish Restoration Program (AFRP) of the Central Valley Project Improvement Act (CVPIA). He was assigned responsibility for the American and Yuba rivers, and continues to provide technical expertise regarding instream flow and habitat issues to the U.S. Fish & Wildlife Service. Mr. Bratovich has participated in a variety of other interagency consultative teams including the Interagency Ecological Program (IEP) Resident Fish Project Work Team and the Delta Smelt and Sacramento Splittail Co-applicants Technical Subcommittee, and continues to serve as a technical expert of the Lower American River Operations Working Group and the Alameda County Superior Court Lower American River Technical Advisory Committee in support of the *Environmental Defense Fund (EDF) et al. vs. East Bay Municipal Utility District (EBMUD)* litigation.

He has served as Principal-in-Charge on a number of project initiatives regarding lower American River fisheries issues and has been responsible for the design, implementation, and report preparation of multi-faceted aquatic ecology investigations of the lower American River. Investigative elements have included habitat classification and mapping, application of the Instream Flow Incremental Methodology (IFIM), estimation of chinook salmon abundance and distribution by habitat type, chinook salmon micro-habitat suitability data acquisition, and water temperature monitoring including the preparation of a water temperature calibration report for Folsom Reservoir and the lower American River.

AMY HARRIS is an aquatic ecologist with a strong background in biological sciences. Her expertise is in design and implementation of monitoring programs for freshwater ecosystems. Ms. Harris has prepared and provided support for aquatic and terrestrial resource impact analyses for CEQA and NEPA documents. She has designed and conducted aquatic and terrestrial surveys for use in habitat monitoring

and planning, including a study of juvenile chinook salmon habitat in the northern Sacramento-San Joaquin delta, freshwater fisheries habitat in the lower Cosumnes River in California, and riparian vegetation surveys along the southern Oregon coast. She has also been involved in habitat restoration planning and implementation projects in the Central Valley.

GEORGE "BUZZ" LINK has over 22 years experience in real-time operation, analysis, and management of water and power systems. Mr. Link has special expertise in the development and application of mathematical computer planning models for water and power operations that incorporate water supply, water quality, power supply, flood control, recreation, and fish and wildlife considerations. Mr. Link is a registered professional engineer in the state of California. Prior to becoming president of Surface Water Resources, Incorporated, Mr. Link served as a water and power resources engineer with both Water Resources Management, Inc. and Resource Management International, and as a hydraulic engineer with the U.S. Bureau of Reclamation. Mr. Link developed operation simulation models for the U.S. Bureau of Reclamation that evaluate water and hydroelectric project attributes of existing and planned Central Valley Project facilities. These models facilitate evaluation of alternative water and hydroelectric project features and configurations and their effects on water supply and power generation.

RICK LIND has over 17 years of experience as a regulatory program manager, environmental planner and public involvement specialist in the energy, water and solid waste industries. He is a notable regulatory program management expert who has performed a wide spectrum of environmental review services, including analyses of licensing and permitting requirements, preparation of regulatory strategy reports, preparation of joint National Environmental Policy Act/State Environmental Regulatory documents, and compliance monitoring.

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VI. COMPLIANCE WITH STANDARD TERMS AND CONDITIONS

The terms and conditions are acceptable, and SAFCA will be in compliance with all terms.

Cost

SRA Habitat Instream Cover Demonstration Project									
Project Phase and Task	Direct Labor Hours	Direct Salary and Benefits	Overhead Labor	Service Contracts		Materials	Misc. and Direct Costs	Total Cost	Subtotal/ Task
				Labor	Materials				
Task 1: Pre-construction Approval			\$1,500	\$10,000					\$11,500
Task 2: Site-specific Construction Design			\$3,600	\$24,000					\$27,600
Task 3: Monitoring Plan			\$450	\$3,000					\$3,450
Task 4: Construction			\$2,550	\$17,000	\$65,000				\$84,550
Task 5: Monitoring and Evaluation			\$28,200	\$188,000					\$216,200
Task 6: Final Report			\$750	\$5,000					\$5,750
Task 7: Progress Reports			\$0	\$0					\$0
Task 8: Operation and Maintenance			\$7,500	\$50,000					\$57,500
Subtotal			\$44,550	\$297,000	65,000				\$406,550
Contingency (10 percent)									\$40,655
Subtotal			\$44,550	\$297,000	65,000				

Total Cost of Project	\$447,205
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PROJECT COST SHARING			
Project Phase and Task	Total Cost by Task	CALFED Cost Share	SAFCA Cost Share
Task 1: Pre-construction Approval	\$11,500	\$11,500	
Task 2: Site-specific Construction Design	\$27,600	\$27,600	
Task 3: Monitoring Plan	\$3,450	\$3,450	
Task 4: Construction	\$84,550	\$84,550	
Task 5: Monitoring and Evaluation	\$216,200	\$216,200	
Task 6: Final Report	\$5,750	\$5,750	
Task 7: Progress Reports	\$0		
Task 8: Operation and Maintenance	\$57,500		\$57,500
Contingency (10 percent)	\$40,655	\$40,655	
Total	\$447,205	\$389,705	\$57,500

1-006209

1-006209

NONDISCRIMINATION COMPLIANCE STATEMENT

COMPANY NAME

Sacramento Area Flood Control Agency

The company named above (hereinafter referred to as "prospective contractor") hereby certifies, unless specifically exempted, compliance with Government Code Section 12990 (a-f) and California Code of Regulations, Title 2, Division 4, Chapter 5 in matters relating to reporting requirements and the development, implementation and maintenance of a Nondiscrimination Program. Prospective contractor agrees not to unlawfully discriminate, harass or allow harassment against any employee or applicant for employment because of sex, race, color, ancestry, religious creed, national origin, disability (including HIV and AIDS), medical condition (cancer), age, marital status, denial of family and medical care leave and denial of pregnancy disability leave.

CERTIFICATION

I, the official named below, hereby swear that I am duly authorized to legally bind the prospective contractor to the above described certification. I am fully aware that this certification, executed on the date and in the county below, is made under penalty of perjury under the laws of the State of California.

OFFICIAL'S NAME

F.I. Hodgkins

DATE EXECUTED

July 24, 1997

EXECUTED IN THE COUNTY OF

Sacramento

PROSPECTIVE CONTRACTOR'S SIGNATURE

PROSPECTIVE CONTRACTOR'S TITLE

Executive Director

PROSPECTIVE CONTRACTOR'S LEGAL BUSINESS NAME

Sacramento Area Flood Control Agency

**NONCOLLUSION AFFIDAVIT TO BE EXECUTED BY
 BIDDER AND SUBMITTED WITH BID FOR PUBLIC WORKS**

STATE OF CALIFORNIA)
)
 COUNTY OF Sacramento) ss

F.I. Hodgkins, being first duly sworn, deposes and
 (name)
 says that he or she is Executive Director of
 (position title)
Sacramento Area Flood Control Agency
 (the bidder)

the party making the foregoing bid that the bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation; that the bid is genuine and not collusive or sham; that the bidder has not directly or indirectly induced or solicited any other bidder to put in a false sham bid, and has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or that anyone shall refrain from bidding; that the bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder, or to secure any advantage against the public body awarding the contract of anyone interested in the proposed contract; that all statements contained in the bid are true; and, further, that the bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, or paid, and will not pay, any fee to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof to effectuate a collusive or sham bid.

DATED: July 24, 1997 By [Signature]
 (person signing for bidder)

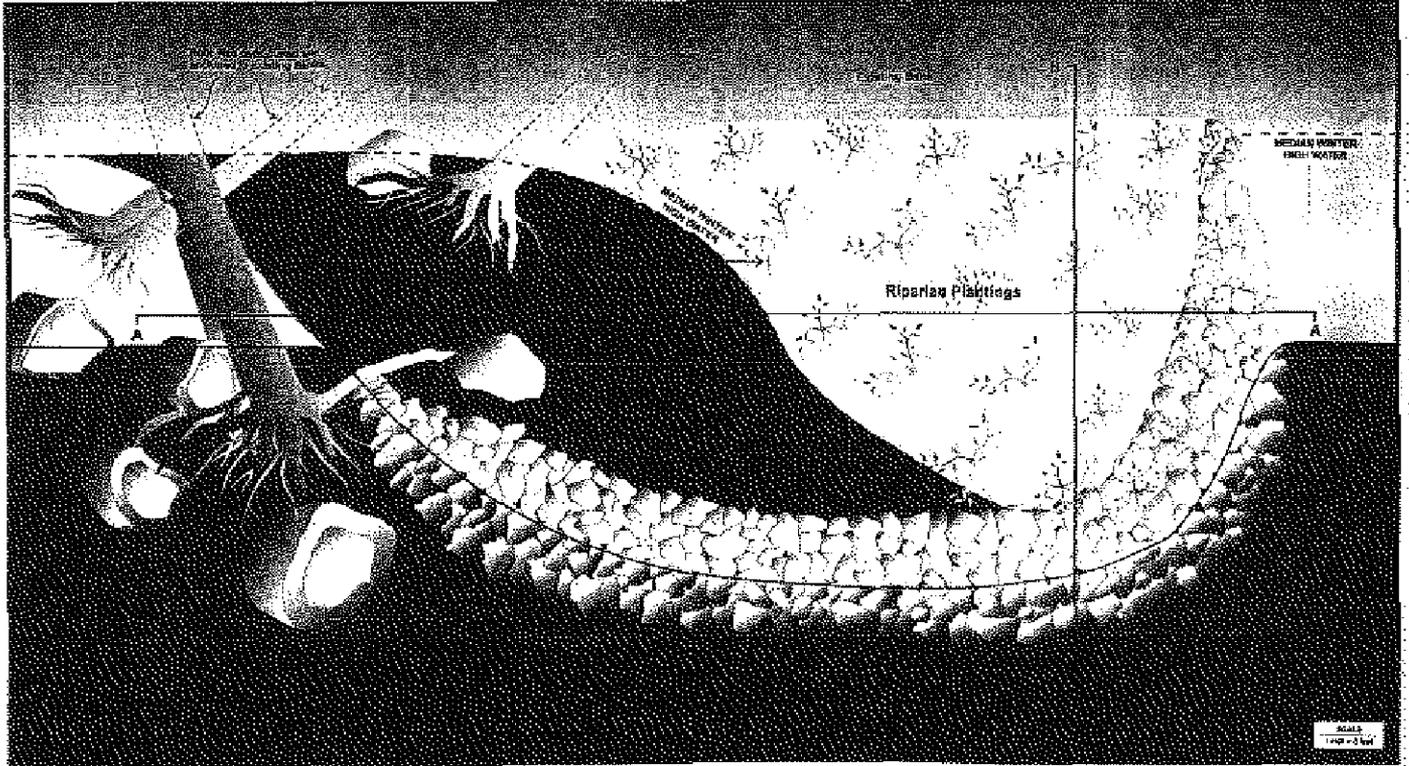


(Notarial Seal)

Subscribed and sworn to before me on

July 24, 1997
[Signature]
 (Notary Public)

1-006212



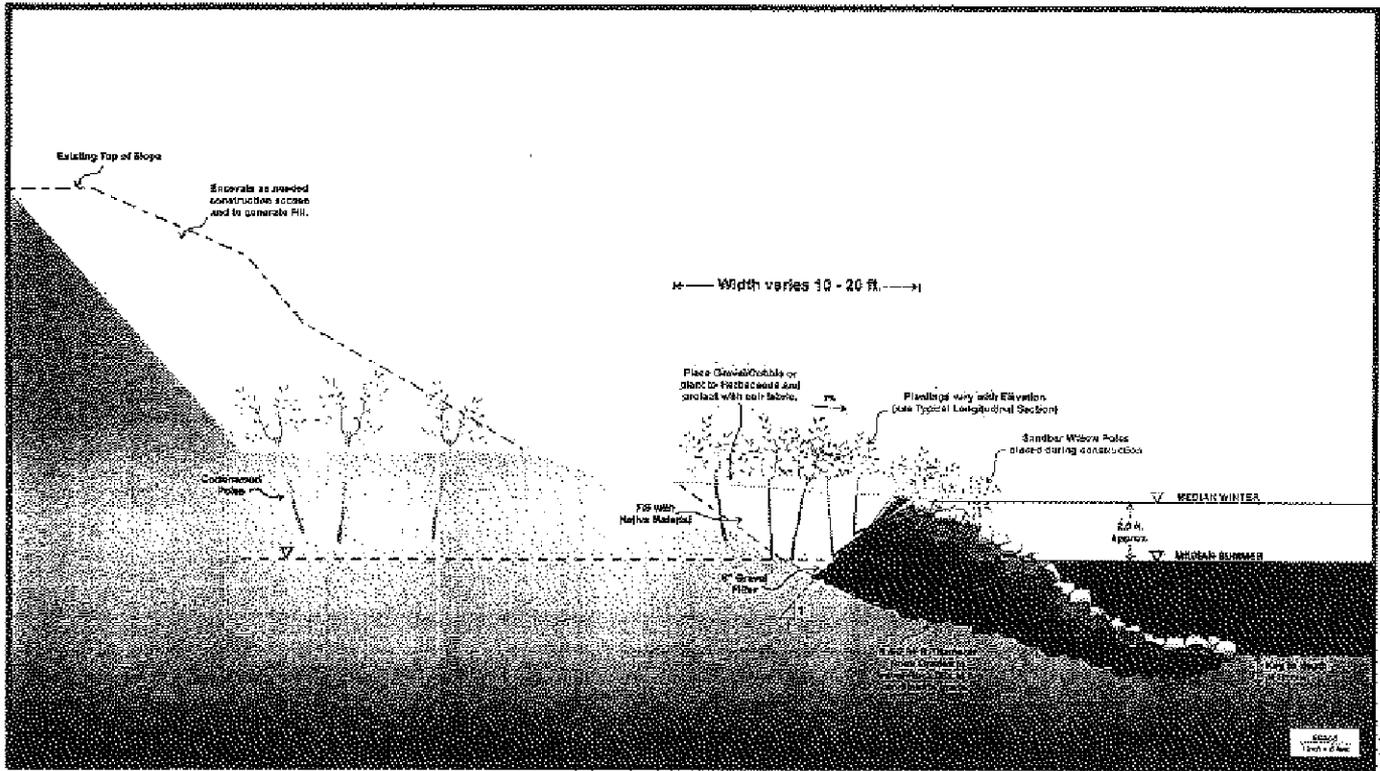
Mitchell Sosaon, Hydrology & Geomorphology

Typical Plan View: Goethe Park Instream Cover/SRA Structure

**HYDRO
SCIENCE**

1-006212

1-006214



Mitchell Swanson Hydrology & Geomorphology



Typical: Goethe Instream Cover / SRA, Section B-B

1-006214

Lower American River Task Force

STATEMENT OF SUPPORT

for

CALFED APPLICATION

(Ratified by the Lower American River Task Force on July 15, 1997)

The Lower American River Task Force has reviewed and supports the attached application to CALFED for restoration of key sites on the Lower American River. We strongly urge that these valuable projects be funded. They will provide critical information for the development of restoration opportunities for this important river system.

Community Groups

1. American River Parkway Foundation
2. California State University, Sacramento
3. Campus Commons Park Corporation
4. Citizens-at-Large
5. Dos Rios Neighborhood Association
6. Natomas Community Association
7. River Park Neighborhood Association
8. Sierra Oaks Neighborhood Association

Environmental Interests

1. Environmental Council of Sacramento (ECOS)
2. Environmental Defense Fund
3. Friends of the River
4. Protect American River Canyons (PARC)
5. Save the American River Association (SARA)
6. Sierra Club, Mother Lode Chapter

Flood Control Agencies

1. American River Flood Control District
2. City of Sacramento Utilities
3. City of West Sacramento
4. Reclamation District 900
5. Reclamation District 1000
6. Sacramento Area Flood Control Agency (SAFCA)
7. State Reclamation Board
8. State Department of Water Resources

Recreation Interests

1. California Exposition and State Fair
2. Sacramento County Parks and Recreation

Resource Agencies

1. State Department of Fish and Game
2. State Lands Commission
3. U.S. Fish and Wildlife Service