D1001

Attachment H

COVER SHEET (PAGE 1 of 2)

May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

Proposal Title: Goodwin Canyon Spawning Gravel Introduction, Stanislaus River
Applicant Name: Clarence Mayott, California Department of Fish and Game
Mailing Address: 1234 East Shaw Avenue, Fresno, California 93710
Telephone: (209) 243-4005, Ext. 171
Fax: (209) 243-4022

Amount of funding requested: $ 384,384 over 3 years

Indicate the Topic for which you are applying (check only one box). Note that this is an important decision: see page __ of the Proposal Solicitation Package for more information.

- ☐ Fish Passage Assessment
- ☐ Fish Passage Improvements
- ☐ Floodplain and Habitat Restoration
- ☒ Gravel Restoration
- ☐ Fish Harvest
- ☐ Species Life History Studies
- ☐ Watershed Planning/Implementation
- ☐ Education
- ☐ Fish Screen Evaluations - Alternatives and Biological Priorities

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

- ☐ Sacramento River Mainstem
- ☐ Sacramento Tributary: _____
- ☐ Delta
- ☐ East Side Delta Tributary: _____
- ☐ Suisun Marsh and Bay
- ☒ San Joaquin Tributary: Stanislaus River
- ☐ San Joaquin River Mainstem
- ☐ Other: _____
- ☐ Landscape (entire Bay-Delta watershed)
- ☐ North Bay: _____

Indicate the primary species which the proposal addresses (check no more than two boxes):

- ☐ San Joaquin and East-side Delta tributaries fall-run chinook salmon
- ☐ Winter-run chinook salmon
- ☐ Spring-run chinook salmon
- ☐ Late-fall run chinook salmon
- ☒ Fall-run chinook salmon
- ☐ Delta smelt
- ☐ Longfin smelt
- ☐ Splittail
- ☒ Steelhead trout
- ☐ Green sturgeon
- ☐ Striped bass
- ☐ Migratory birds

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May 1998 CALFED ECOSYSTEM RESTORATION PROPOSAL SOLICITATION

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

☒	State agency	☐	Federal agency
☐	Public/Non-profit joint venture	☐	Non-profit
☐	Local government/district	☐	Private party
☐	University	☐	Other: _____

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

☐	Planning	☒	Implementation
☐	Monitoring	☐	Education
☐	Research		

By signing below, the applicant declares the following:

(1) the truthfulness of all representations in their proposal;

(2) the individual signing the form is entitled to submit the application on behalf of the applicant (if applicant is an entity or organization); and

(3) the person submitting the application has read and understood the conflict of interest and confidentiality discussion in the PSP (Section II.K) and waives any and all rights to privacy and confidentiality of the proposal on behalf of the applicant, to the extent as provided in the Section.

Perry L. Herrgesell

(Signature of Applicant)

Goodwin Canyon Spawning Gravel Introduction, Stanislaus River

I. Executive Summary

Applicant California Department of Fish and Game (DFG)
Region 4
1234 East Shaw Avenue
Fresno, California 93710

Project Description and Primary Biological/Ecological Objectives
The purpose of the project is to continue the phased restoration of the coarse sediment supply to the Stanislaus River by introducing 11,000 tons of clean gravels into the river just below Goodwin Dam. Clean, sized river-run gravels would be placed into the river 0.5 miles downstream of Goodwin Dam. This project assumes gravel movement would occur. The gravel mix introduced would be smaller than the gravels on the current riverbed surface, so that the contemporary flow regime can transport these spawning gravels downstream. The gravels would be mobilized, deposited on bars and form useful spawning habitat, and be redeposited over time. Routing these gravels downstream would functionally provide a long project life span. All the gravel placed during the project would eventually be moved downstream by the flow of the Stanislaus River, mimicking the natural process of coarse sediment loading and transport. Increased and improved chinook salmon and steelhead trout spawning habitat would be expected.

Approach/Tasks/Schedules
The project would be done in 3 phases, each phase completed during a calendar year. Phase 1 would place 5,000 tons (3,333 cubic yards) of spawning gravel in the river. Improvements to an existing irrigation canal bridge and access road would also be done at this time to ensure materials can be delivered to the site safely. All work necessary for this phase of the project would be completed in 1999.

Phase 2 and Phase 3 would each add 3,000 tons (2,000 cubic yards) of spawning gravel into the river. Phase 2 and Phase 3 would be completed in 2000 and 2001 respectively.

In all Phases, gravel from local sources would be purchased, transported and placed into the river. The gravel addition site selected was chosen because of its biological potential to support spawning, good geomorphic and hydrological conditions for gravel transport, and the ease of access.

Justification for Project and Funding by CALFED
Construction of Goodwin Dam in 1913 ended coarse sediment supply from the Stanislaus River watershed upstream of Goodwin Canyon. Since its construction, sediment transported during high flows have come from the bed itself or limited floodplain deposits. Elimination of upstream sediment supply has caused bed particle coarsening in the Goodwin Canyon spawning reach near the town of Knights Ferry. This deterioration of salmon spawning habitat has been identified in the CALFED process as a primary stressor of salmon and steelhead trout. Gravel supplies are a critical part of salmonid restoration efforts and long-term maintenance of these gravels and fluvial processes is necessary. This project would mimick the natural process of coarse sediment supply and would help increase and improve degraded spawning habitat in the upper reach of the designated spawning area (ref. Fish and Game Code 1505) of the Stanislaus River.

Budget Costs and Third Party Impacts
The majority of cost would be incurred from purchasing, processing, transporting and placing the necessary gravel. Based on similar projects completed in the recent past, a estimated total cost of $25/ton would be necessary to complete the project. Phase 1 costs include the improvement to existing access. Funding for all phases is being requested; a total of $384,384. No third party impacts are expected.

Applicants Qualifications
The DFG Region 4's anadromous fisheries and DWR San Joaquin District engineering staffs have worked closely with various other state, federal and private personnel, to construct and repair chinook salmon spawning, rearing and predator pond isolation projects in the San Joaquin River basin. The DFG and DWR have the clerical, fiscal and contractual personnel necessary to support the biological and technical experts administering this project. In 1997 and 1998, Region 4 staff worked in conjunction with the Stanislaus Fly Fishermen Incorporated and the U. S. Bureau of Reclamation (USBR) to add a total of 5,000 tons of spawning gravel to this site.

Monitoring and Data Evaluation
Four physical monitoring techniques would be used: cross section surveys, pebble counts, tracer gravels and visual inspection/area mapping. Cross sections would be placed through the alluvial features created at the introduction site, and would document changes in morphology (overall gain or loss of gravel storage). Cross sections would be the primary technique to evaluate changes in gravel storage year to year. Pebble counts across these cross sectional surveys would be utilized to supplement this information. Tracer gravels (painted gravels) would be placed in gravel introduction deposits to document general bed mobility thresholds and travel distance during high flow events. Visual inspection and subsequent mapping of the Goodwin Canyon reach would indicate where the gravels are being deposited. Since completing the 1997 project at this site, DFG staff have been, and will continue to monitor gravel movement in this area until 2000.

DFG chinook salmon spawning distribution (weekly redd counts) during escapement surveys would continue to provide valuable data to help evaluate the biological impacts of the proposed project.

Local Support/Coordination with other Projects/Compatibility with CALFED Objectives
This project is supported by numerous individuals and agencies including; U. S. Corps of Engineers (USCOE), US Fish and Wildlife Service (USFWS), USBR, Oakdale Irrigation District (OID), Stanislaus Fly Fishermen, Cal Trout and others.

A similar project is to be constructed and evaluated by Dr. Carl Mesick (Carl Mesick Consulting) in 1999. Dr. Mesick's project consists of 18 gravel addition sites located downstream between Two Mile Bar and the Orange Blossom Bridge, an area of lesser gradient than this project site. Comparison of these projects may prove valuable in determining physical spawning preferences of Stanislaus River salmon.

II. Title Page

Applicants

California Department of Fish and Game (DFG)
Region 4
1234 East Shaw Avenue
Fresno, California 93710
Telephone (209) 243 4005
Fax (209) 243 4022

California Department of Water Resources (DWR)
San Joaquin District
3374 East Shields Avenue
Fresno, California 93726
Telephone (209) 445 5236

Organization

Public Agency

Contact Person

Mr. Clarence J. Mayott
1234 East Shaw Avenue
Fresno, California 93710
(209) 243 4005 ext. 171

Type Project

Construction

III. Project Description

Project Description and Approach

The purpose of the project is to start the restoration of the coarse sediment supply to the lower Stanislaus River by introducing clean gravels into the river just below Goodwin Dam (Figure 1). The gravels would be smaller than the gravels on the current bed surface, so that the contemporary flow regime can transport these gravels downstream. This project assumes gravel movement would occur. The gravels would be mobilized, deposited as bars and spawning habitat, and redeposited over time. Routing these gravels downstream would functionally provide a long project life span. All the gravel placed during the project would be moved downstream by the flow of the Stanislaus River, mimicking the natural process of coarse sediment loading and transport. Increased and improved chinook salmon and steelhead trout spawning habitat would be expected.

The project would be done in 3 phases, each phase completed during a calendar year. Phase 1 would place 5,000 tons (3,333 cubic yards) of spawning gravel in the river. Improvements to an existing bridge, the OID canal bridge, and access road would be completed. All work necessary for this phase of the project would be completed in 1999.

Phase 2 and Phase 3 would each add 3,000 tons (2,000 cubic yards) of spawning gravel into the river. Phase 2 and Phase 3 would be competed in 2000 and 2001 respectively.

At the project site, there are two easily accessible areas where gravels would be added to the river. Area 1 is directly downhill from the OID canal bridge. Area 2 is located approximately 0.3 miles downstream (Figure 2). Ten-wheel dump trucks would deliver clean, sized spawning gravel to the project site and off-load in staging areas approximately 100 feet from the river. An existing OID maintenance road is available in order to support this traffic. The gravel staging areas are located at wide spots in the road . Minor disturbance to existing vegetation in the immediate area is expected. Over-hanging branches and limbs along this road may be trimmed to facilitate access.

After delivery, a front-end loader would be used to place the gravel in the river. Each area's physical parameters would dictate exactly where and how much gravel would be placed. In all cases, gravel placement would be done in a manner least disturbing to riparian vegetation and the overall biological health of the area.

Once the gravel has been placed in the river, controlled water releases from Goodwin Dam would be increased under normal scheduling requirements to distribute the new gravel throughout the reach. Even though much of this river reach is bedrock, there exist many areas capable of holding the gravel deposits and creating salmonid spawning habitat. Gravel deposits would also move downstream and enhance spawning habitat within the reach. Over time, all the gravel placed during this project would be moved downstream by the flows of the Stanislaus River,

mimicking natural processes associated with coarse sediment movements in rivers. As it moves, it should continue to enhance salmonid spawning habitat.

Upon removal of all equipment, the construction and staging areas would be "cleaned" and contoured to the satisfaction of U.S. Army Corps of Engineers (USCOE) park rangers. All disturbed areas would be seeded with native grass seed. If necessary, some minor revegetation in the area would be completed.

Spawning gravel used in this project would be purchased from nearby vendors. The following washed, river-run gravel mix would be used. A +/- 5% error in the mix would be acceptable.

Gravel Size	% Passing
1/2 inch	0%
6 inch	100%

After completion of this three-year project and associated monitoring, a continued, maintenance program of periodic gravel addition to this site may be developed to replenish gravel transported out of the area by existing flows.

Geographical Location And Description

The project site is located on the lower Stanislaus River 0.5 miles below Goodwin Dam (river mile 58.5), approximately 10 miles east of Knights Ferry. Access is via Tulloch Road at the OID turn out, which is also the USCOE, Goodwin Canyon public access. Access to the immediate site is via an existing OID maintenance road.

The project area is classified as a Blue Oak-Digger Pine community using the California Wildlife-Habitat Relationship (WHR) classification system. Steep hillsides support a mix of hardwoods, conifers and shrubs. Blue oak and digger pine dominate the overstory of the project site. Interior live oak and California buckeye are also present in good numbers. The shrub component is typically clumped with interspaced patches of annual grasses. Most common shrub species include California coffeeberry, California redbud, poison oak, gooseberry, bush lupine and several ceanothus and manzanita species.

The project area along the Stanislaus River is composed largely of typical riparian vegetation including cottonwoods, buttonbush and several willow species. Sandbar willows have become extremely dense in some locations.

Expected Benefits

Gravel would be added to the Stanislaus River in a reach used as spawning and rearing habitat by fall-run chinook salmon. In the short term, the addition of 11,000 tons of gravel should increase the quantity and quality of salmon spawning and rearing habitat in this reach. Improved spawning productivity should occur. In addition, the increase in gravel supply would produce significant alluvial deposits, which should benefit other inhabitants of the riverine ecosystem including aquatic invertebrates, amphibians and other native fish species including steelhead trout.

In the long-term, these gravels would move through the river system during high flows, redepositing in downstream habitats to be used again and again. Restoring the long-term bedload supply would encourage point bars and in-channel bar features to form, increasing channel and habitat complexity. Continued introductions of gravels at a rate equal to that of mainstem transport would help restore the coarse sediment balance and maintain instream storage of these gravels. Improved salmon spawning productivity would continue.

Background and Biological/Technical Justification

The lower Stanislaus River supports natural populations of fall-run chinook salmon, steelhead and rainbow trout. Fall-run salmon spawning escapement estimates from 1990 to 1996 have ranged from only 160 fish in 1996, to 1,079 in 1994. The average escapement population for this period is only 475 fish. Escapement populations for 1997 were estimated to be 1,500 fish. However, populations of 13,000 fish were recorded in 1985 and historic high populations of 35,000 were recorded in 1953 (Neillands, 1998).

A small but viable steelhead trout population remains in the Stanislaus River below Goodwin Dam. Anglers in the Knights Ferry area occasionally report steelhead trout from 2 to 10 pounds. In March 1996, Department of Fish and Game (DFG) personnel identified a large (24-inch) steelhead trout, caught illegally just below Goodwin Dam. Rotary screw trapping on the Stanislaus River has continually documented out-migrating yearling steelhead trout, indicating a small but successful natural reproduction cycle (Demko, 1996). A natural rainbow trout population is also well documented in the lower Stanislaus River.

DFG biologists and private fishery consultants (Baumgartner, 1996; Mesick et al. 1996) report very limited chinook salmon spawning activity in the Stanislaus River from Goodwin Dam downstream to Two Mile Bar (Goodwin Canyon). Snorkeling surveys and visual observations by DFG personnel and private fishery consultants confirm a lack of suitable spawning gravel in this steeper gradient reach. Goodwin Dam, constructed in 1913, and other dam construction upstream have modified the natural recruitment of gravel into the Goodwin Canyon reach and may be the most likely cause for the lack of salmon, steelhead and rainbow trout spawning gravel in this area. Water quality, geomorphological characteristics and professional observation of salmon activities indicate this reach may provide valuable salmon spawning habitat if suitable gravel is available.

The coarse sediment supply critical for salmonid habitat has been eliminated, and the fine sediment supply that is damaging to salmonid habitat has increased relative to mainstem flows. The proposed project would distribute a large volume of gravel in the upper two miles of anadromous salmonid habitat on the Stanislaus River. Future phases of this project may maintain this instream storage with yearly gravel introduction at a rate equal to downstream transport. This approach would mimick how the river use to function prior to flow and sediment regulation. The project would provide a long-term gravel source so that the river would be dynamic (transports gravel) but with a roughly constant instream storage (equilibrium).

In 1997, the DFG , in conjunction with the Stanislaus Fly Fishermen Incorporated and the USBR, placed 2,000 tons of spawning size gravel, in this Goodwin Canyon reach (river mile 58.0 to

58.8). Monitoring of this pilot project showed very favorable results including increased salmon spawning activity at the site compared to recent years. Gravel movement due to river flows occurred as expected with no adverse effects. Because of the apparent success of this project, funds were obtained from Salmon Stamp funds to add 3,000 tons of gravel to the area. That project is planned to be completed in August, 1998.

DFG Region 4 staff have been monitoring some physical parameters of this site since 1996 and are funded to continue monitoring gravel movement in this reach until 2000. Region 4 biologists routinely monitor salmon escapement populations in this reach each year.

Projects similar to the one described here have been constructed and evaluated on the upper Sacramento River below Keswick Dam (USFWS Report No. AFF1-FRO-94), and on the Merced River near Snelling. Projects similar to this are planned for the Tuolumne River near La Grange (Mayott, 1998) and in the Knights Ferry/Orange Blossom Bridge area of the Stanislaus River (Mesick,1998).

Proposed Scope of Work

Phase 1, completed in summer1999: Necessary evaluation and possible improvements to an existing canal access bridge and road would be completed. Approximately 5,000 tons (3,333 cubic yards) of clean gravels would be added to the Stanislaus River just downstream of Goodwin Dam (river mile 58.8). Because of past gravel addition projects at this site, pre-project monitoring is completed. Monitoring would continue through August, 2002 with the first monitoring report due in June 2000.

Phase 2, completed in summer 2000: Approximately 3,000 tons (2,000 cubic yards) of clean gravels would be added to the river at the same site. Monitoring would continue through August, 2002 with the second monitoring report due in June 2001.

Phase 3, completed in summer 2001: Approximately 3,000 tons (2,000 cubic yards) of clean gravels would be added to the river at the same site. Monitoring would continue through 2002 with the final monitoring report due in August, 2002. Once monitoring is completed, recommendations regarding continued, annual gravel addition would be provided for consideration.

In all phases DFG Region 4 staff personnel would preform the necessary construction work. Monitoring would be completed by DWR San Joaquin District staff.

Monitoring and Evaluation

The two objectives of this project are to reestablish substantial instream storage of spawning sized gravels, and to help maintain this storage by adding gravels into this river reach at a rate roughly equal to instream transport during high flow events. Monitoring and data evaluation would determine and evaluate whether these objectives were being satisfied by the proposed activities. For example, if the monitoring plan documents that net instream storage decreases, then the yearly gravel introduction volume may need to be increased accordingly.

Four physical monitoring techniques would be used: cross section surveys, pebble counts, tracer gravels and visual inspection/area mapping. Cross sections would be placed through the alluvial features created at the introduction site, and would document changes in morphology (overall gain or loss of gravel storage). Spatial differences in morphological adjustment would be evaluated by comparing trends in cross sections in the downstream direction (e.g., are upstream reaches degrading and downstream reaches aggrading with gravel). Cross sections would be the primary technique to evaluate changes in gravel storage year to year. Pebble counts across these cross sections would be utilized to supplement this information. Tracer gravels (painted gravels) would be placed in gravel introduction deposits to document bed mobility thresholds and travel distance during high flow events. Visual inspection and subsequent mapping of the Goodwin Canyon reach would indicate where the gravels are being deposited. DFG staff have been, and will continue to monitor the 1997 gravel addition project completed in this area.

Biological monitoring of the annual fall-run chinook salmon escapement is currently the responsibility of DFG's Region 4 personnel. DFG biologists annually estimate and monitor the adult chinook salmon escapement in the Stanislaus River. Data currently gathered includes a mark/recapture study to estimate population size, fork lengths, sex and hatchery contribution of returning fish. Scale and otolith samples are taken to determine age/growth rates and tissue samples are taken for genetic evaluation. The number of redds deposited weekly on each riffle, live fish per riffle and the timing of returning runs are also noted. These escapement surveys will continue and this data would be utilized to evaluate the biological changes associated with the gravel introductions. Redd mapping of the affected gravel bars (riffles) would also be conducted to help evaluate the biological impacts.

Implementability

Support for this acquisition comes from the San Joaquin River Management Program participants, environmental groups, sport and commercial salmon fishers, and the numerous agencies involved in restoring riparian, wetland and aquatic habitats throughout the state. In September, 1997, 2,000 tons of gravels were placed in the river at this site. Because of the apparent success, 3,000 tons of additional gravel are planned to be placed in the river at this site in August, 1998. All permits, access permission and environmental documentation (Negative Declaration) have been secured for these projects and would be appropriate for the next three years.

Material for all phases of the project is available nearby. Discussions with contractors indicate no problems in supplying the necessary materials to the site. Placement of the material would be completed by DFG employees.

A small bridge, spanning the OID canal, must be used to bring material to the site. This bridge was inspected by USBR engineers in September, 1997. It is capable of supporting the weight of the trucks and material crossing it to reach the project site. No problems were encountered during the 1997 project and no apparent damage to the bridge was observed. In order to provide the best safety practices, it would be necessary to have this bridge inspected by appropriate engineers prior to starting this project. If necessary, repairs would be made.

The land adjacent and south of the gravel introduction sites is owned by the USCOE. All equipment and materials would access and remain on this USCOE land. The land adjacent and north of the site is privately owned. Permission to complete the 1997-1998 projects has been obtained from this land owner. This private land is not affected by the project. OID owns a parcel of land immediately east of the project and necessary access agreements were developed during the 1997-1998 projects. This private land is not affected by the project. Discussions concerning future, similar projects at this site suggest no problems with private land owners in the area.

The project would occur within a moderately used, summer recreation area. The major uses at the project site are fishing, kayaking, and rafting. The project would be constructed after the commercial and private rafting season is completed; however, individual rafters and kayakers may be affected. USCOE personnel would post the area to the general public during project construction. Signs visible from the river would be posted upstream of the construction site to warn anglers and others of active construction.

Full archeological reviews were conducted at or near the project site during preparation of the USCOE Stanislaus River Parks Operational Management Plan. These reviews indicate no finding of archeological or historical significance within the project area.

In summation, this project is relatively easy to implement. Administrative and regulatory documentation is limited and logistical elements pose no problems.

IV. Cost and Schedule to Implement Proposed Project

Budget Costs
The following costs are associated with this project.

	Direct Labor Hours	Direct Salary Benefits	Administration @ 20%	Service Contract	Acquisition	Miscellaneous	TOTAL
Monitoring	270 AsoE 320 AstE 640 TempE 160 AFB 160 TempS	20,000# 20,000# 20,000# 5,350* 1,600	320				61,920
Permits	160 AFB 160 OA 2	5,350* 3,192*	600		Permit Fees 3,000		3,600
Construction	160 HS 160 HA 160 TempS	4,175* 3,081* 1,600	47,320	50,000 to evaluate and repair access bridge	11,000 tons @ $15/ton processed material 165,000	Loader Rental 20,000	283,920
TOTAL		63,200	48,240	50,000	168,000	20,000	349,440
Contingency						@10%=34,944	$384,384

Department of Fish and Game
AFB - Associate Fishery Biologist
OF 2 - Office Assistant
HS - Habitat Specialist
HA - Habitat Assistant
TempS - Scientific Aide
* in-kind: not added into total

Department of Water Resources
AsoE - Associate Engineer
AstE - Assistant Engineer
TempE - Engineering Aide
includes all administrative cost

The majority of project costs would be for the purchase, processing, and transporting of materials. Fifty thousand dollars ($50,000) is budgeted for evaluation and repair of the access bridge to the site. This is a cost estimate that may not be realized if the bridge proves sound. The budget proposed is estimated based on best available information at this time. Costs may vary when actual work begins or contracts are developed. There are no O&M costs associated with this project. Cost sharing of $21,148 is available as DFG in-kind services.

Scheduling Milestones and Incremental Funding
The project would completed in 3 years. Total funding for the project is requested.

Third Party Impacts
No third party impacts are expected.

V. Applicants Qualifications

DFG's Region 4 anadromous fishery staff administered $1.5 million in the 1995-96 fiscal year. In 1995-96 they helped develop 21 habitat restoration projects and completed the environmental documentation for five of these projects. The staff have been named contract managers for several restoration, revegetation, fish screening and fish research projects. Region 4 staff has worked closely with the various other state, federal and private personnel, to construct chinook salmon spawning, rearing and predator pond isolation projects in the San Joaquin River basin.

DWR San Joaquin District engineering staff have developed, designed, constructed and monitored restoration projects in the San Joaquin basin. The staff have been involved in all phases of the restoration effort in the basin and have worked closely with other state, federal and private personnel in this program. The DWR staff have worked closely with DFG staff providing the engineering expertise to complete the following projects.

Merced River Riffle Reconstruction Project 1991: A riffle reconstruction project.

M. J. Ruddy Project 1992: A river restoration project. Site revegetation was also completed.

Stanislaus River Riffle Reconstruction Project 1993: A riffle reconstruction project. Site revegetation was also completed.

Stanislaus River Riffle Reconstruction Project 1995: A riffle reconstruction project. Site revegetation was also completed.

Magneson Pond Predator Isolation Project 1996: A pond isolation project. Site revegetation was also completed.

Merced River Gravel Addition Project 1996: A riffle spawning gravel addition project.

Stanislaus River Gravel Addition Project Goodwin Canyon 1997: A spawning gravel addition project.

Hills Ferry Fish Barrier 1992-2009: A multi year, fish barrier project.

The DFG Region 4 staff assigned to implement the project are:

Mr. Bill Loudermilk, Senior Fisheries Biologist (M/F). Mr. Loudermilk would supervise the overall project at no cost.

Mr. Clarence J. Mayott, Associate Fisheries Biologist (M/F) will be the lead DFG person on this project. He would obtain all necessary permits. He would also develop the contracts necessary to purchase, process and transport the necessary material. He would develop with DWR engineers the physical monitoring protocol. He would be assisted by a seasonal scientific aide.

Mr. Thomas Rogers Fish Habitat Specialist. Mr. Rogers would be responsible to oversee construction of the project. He would be assisted by a permanent Habitat Assistant (Mr. John Lokke) and several seasonal personnel.

The DWR San Joaquin District engineers assigned to monitor the project are:

Mr. Kevin Faulkenberry, Associate Engineer. Mr. Faulkenberry would supervise the overall monitoring program. He would develop the specific physical monitoring protocol, be responsible for the contractual process of CALFED, and complete all monitoring reports. He would be assisted by a seasonal engineering aide.

Mr. David Encinas, Associate Engineer. Mr. Encinas would be responsible for the collection of field data and assist Mr. Faulkenberry in his duties. He would be assisted by several seasonal engineering aides.

This core staff would obtain administrative support from both DFG and DWR's clerical, fiscal and contractual personnel. Region 4's environmental and wildlife personnel would provide technical and scientific review when necessary.

Spawning Gravel Introduction, Stanislaus River, Goodwin Canyon

VI. Compliance with Standard Terms

DFG is a public agency and would comply with appropriate terms and conditions pursuant to policy, regulation and law.

References Cited

Baumgartner, S., 1996. Personal Communication.

Demko D., et. al., 1996. Effects of Pulse Flows on Juvenile Chinook Migration in the Stanislaus River. 1996 Annual Report to the South San Joaquin Irrigation District.

Mesick, C., et. al., 1996. Spawning Habitat Limitations for the Fall-Run Chinook Salmon in the Stanislaus River between Goodwin Dam and Riverbank. Report to Stockton East Water District.

Mesick, C., 1998. Personnel Communication.

Neillands G., et. al., April, 1997. 1995-96 Annual Performance Report; Federal Aid in Sport Fish Management and Research; Project #5 San Joaquin River Chinook Salmon Escapement; Job #2.

USFWS Report #AFF1-FRO-94, 1994. Evaluation of the Sacramento River Spawning Gravel Restoration Project and Winter-Run Chinook Salmon Redd Study.

Figure 1. 1998 Goodwin Canyon Gravel Addition Project

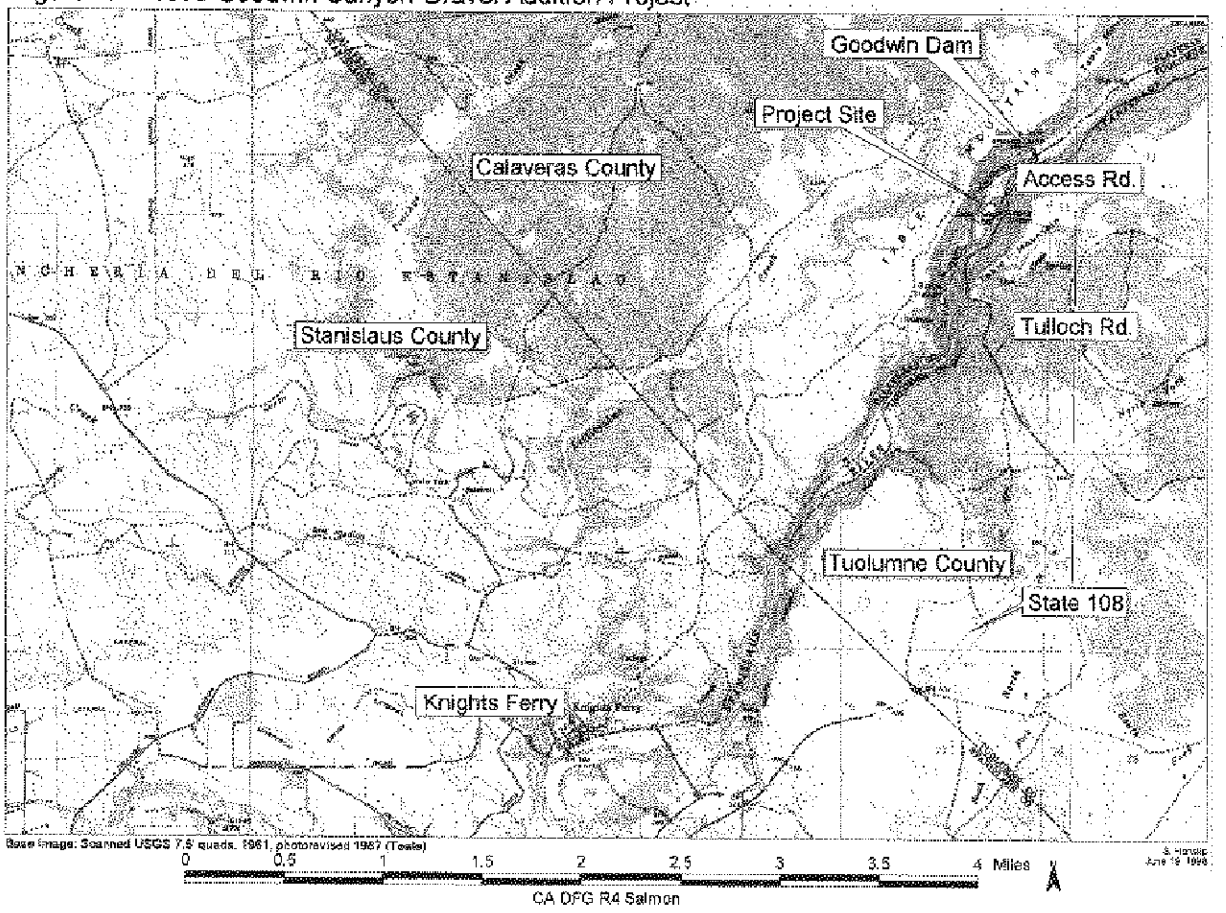

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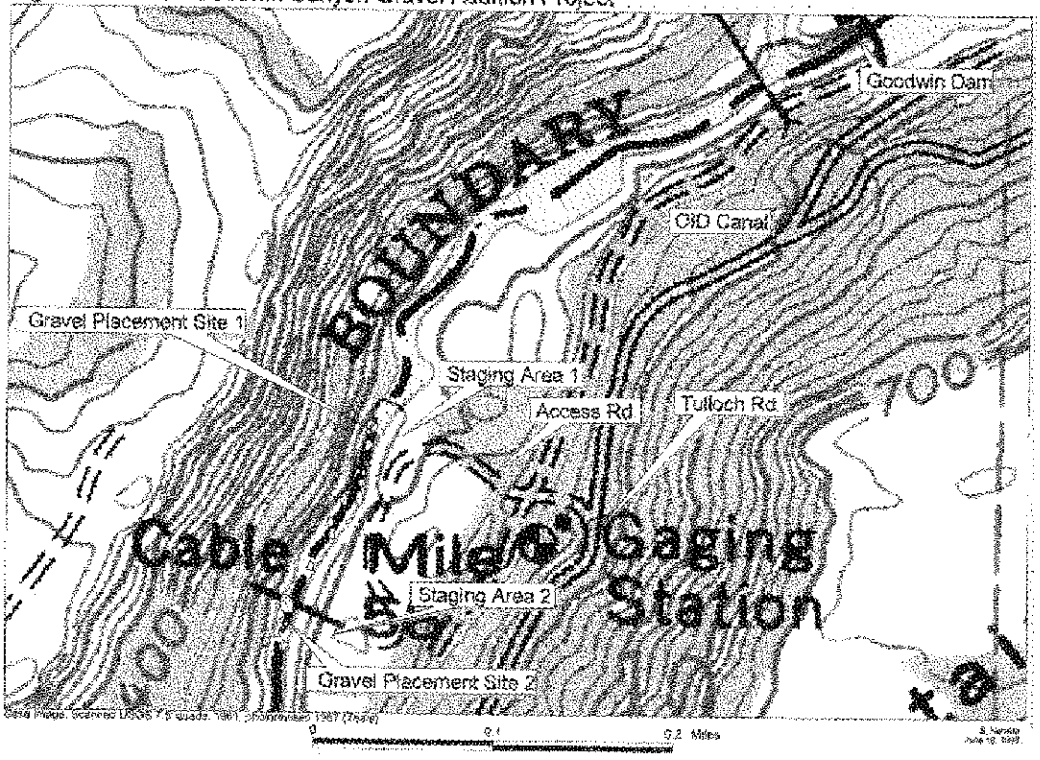
Figure 2: 1998 Goodwin Canyon Gravel Addition Project



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