MEMBER UNITS EXHIBIT NUMBER 14

1996 MEMORANDUM OF UNDERSTANDING FOR
COOPERATION IN RESEARCH AND FISH MAINTENANCE
-SANTA YNEZ RIVER -

THIS MEMORANDUM OF UNDERSTANDING, made and entered into as of March 20, 1996 by and between:

THE CALIFORNIA DEPARTMENT OF FISH AND GAME,

THE SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1,

THE CACHUMA CONSERVATION RELEASE BOARD,

THE UNITED STATES BUREAU OF RECLAMATION,

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT,

THE UNITED STATES FISH AND WILDLIFE SERVICE,

THE NATIONAL MARINE FISHERIES SERVICE,

SANTA BARBARA COUNTY WATER AGENCY,

AND OTHER AGENCIES AS AGREE TO ITS TERMS,

together referred to herein as the "parties", WITNESSETH:

WHEREAS, the United States, Department of the Interior, Bureau of Reclamation, the Santa Ynez River Water Conservation District, Improvement District No. 1, the California Department of Fish and Game, the Santa Ynez River Water Conservation District, the United States Fish and Wildlife Service, the National Marine Fisheries Service, the Santa Barbara County Water Agency, the City of Lompoc, the California Sportfishing Protection Alliance, and the member units of the Cachuma Conservation Release Board (which member units are the Goleta Water District, the City of Santa Barbara, the Montecito Water District, and the Carpinteria County Water District) have an interest to develop the information available and to be available regarding the fishery below Bradbury Dam, and to provide for the fishery below Bradbury Dam; and,

WHEREAS, the parties wish to continue development, consideration and review of such information and to provide for the fishery in an extended program; and,

WHEREAS, many of the parties have participated in the previous, similar understandings, which provide for cooperation in development and sharing of information and management of water resources in a manner which attempts to balance the needs of consumptive water users and the fishery within Lake Cachuma with the needs of the fishery downstream of Bradbury Dam,

WHEREAS, the United States, Department of the Interior, Bureau of Reclamation, the Santa Ynez River Water Conservation District, Improvement District No. 1, the Santa Barbara

County Water Agency, and the member units of the Cachuma Conservation Release Board prepared an EIR/EIS for the Cachuma Project Contract Renewal and intend to expand the data collection and analysis performed for that document with the goal to reach general agreement on fishery issues for presentation to the State Water Resources Control Board by the year 2000,

NOW THEREFORE, THE PARTIES ENTER THIS MEMORANDUM OF UNDERSTANDING to share work and information necessary for a mutually satisfactory resolution of their respective concerns related to the protection of fish and the protection of existing domestic and agricultural water uses, in accordance with the following provisions:

1. CONSENSUS COMMITTEE In order to implement this Memorandum of Understanding and to direct cooperative efforts with regard to fisheries within the Santa Ynez River below Bradbury Dam, the parties shall maintain a Consensus Committee to direct the efforts of a Technical Advisory Committee to advise on fisheries issues. The parties will maintain a Consensus Committee consisting of one designated representative from each party to this Memorandum of Understanding who shall meet at least semi-annually to provide policy, financial, legal, engineering or other assistance to a Technical Advisory Committee (provided herein), as may be required by the parties. The Consensus Committee shall analyze and determine the feasibility of fishery resource management alternatives recommended by the Technical Advisory Committee, considering the need for consensus, potential impacts to water supply, cost, potential benefits, and the need to minimize conflicts. The United States, Department of Interior, Bureau of Reclamation (Bureau of Reclamation, herein) shall provide a Chair to preside over and conduct the meetings of the Consensus Committee. The Consensus Committee shall have the following responsibilities:

a. The Consensus Committee shall review the work and the recommendations of the Technical Advisory Committee (as provided herein) determine the feasibility of fishery resource management alternatives, and take such action as the Consensus Committee determines appropriate to acquire the information requested by the California State Water Resources Control Board, for hearings in the year 2000, pursuant to the provisions of this Memorandum of Understanding. The Consensus Committee shall make available all Technical Advisory Committee work and recommendations to the State Water Resources Control Board.

b. The Consensus Committee shall be given an accounting (to be maintained by the Bureau of Reclamation) of all water held in the Fish Reserve Account, described in Paragraph 7, herein, all water released in accord with this Memorandum of Understanding, and the schedule proposed for any further releases, on a regular and periodic basis, during the term hereof.

2. TECHNICAL ADVISORY COMMITTEE The parties will maintain a Technical Advisory Committee, composed of persons with special training or experience in the fields of fishery biology, engineering, hydrology, and/or water supply and distribution in order to enhance cooperation among the parties; to collect, analyze and share information related to Santa Ynez River Watershed fisheries; and to make recommendations for releases of water related to fisheries. So long as adequate provisions are made for administrative support and project management, the State Department of Fish and Game shall provide a Chair to preside over and conduct the meetings of the Technical Advisory Committee and of the Biology Subcommittee. Each party may appoint a member to the Technical Advisory Committee. The State Water Resources Control Board may appoint a member to serve in *ex officio* status on the Technical Advisory Committee. The Technical Advisory Committee will meet regularly, or as often as

it shall deem necessary, to fully explore alternative measures for the maintenance of fish downstream of Bradbury Dam. The Technical Advisory Committee shall have the following responsibilities:

a. The Technical Advisory Committee shall establish a process for the collection of relevant fishery data, including, but not limited to temperature, flows, location and condition of fishery resources ('condition' to be further defined by the Consensus Committee), which information shall be made available to all parties and to all interested persons, at regular intervals. The Technical Advisory Committee shall attempt to determine the location, habitat requirements, and condition of fish located downstream of Bradbury Dam.

b. The Technical Advisory Committee shall develop recommendations for consideration by the Consensus Committee regarding habitat conditions and instream flows to conserve, and, where reasonable, improve fish habitat in the Santa Ynez River below Bradbury Dam. These recommendations shall be based on information collected and shall, to the greatest extent possible, reflect a Technical Advisory Committee consensus effort.

c. The Technical Advisory Committee's study coordinator shall provide a progress report that analyzes the data collected by the Committee through June 30, 1996, and integrates these findings with information in the Cachuma Contract Renewal EIS/EIR and other existing relevant information. The Technical Advisory Committee shall complete the report and provide it to the Consensus Committee by November 1, 1996. Thereafter, the Technical Advisory Committee shall provide an annual progress report and summary of minutes of meetings by November 1, each year. The annual report shall contain new and revised findings and provide recommendations for focusing any future work on remaining unresolved issues. The Technical Advisory Committee's management alternatives for fisheries resources shall be presented to the Consensus Committee as early as is feasible, according to a schedule to be approved by the Consensus Committee.

d. A subcommittee of the Technical Advisory Committee (referred to herein as the Biology Subcommittee), composed of the three biologists who have served through the previous annual understandings of the parties, shall make recommendations (as provided in Paragraph 7, hereof) to the Bureau of Reclamation regarding the release of water from the Fish Reserve Account, described herein, and make recommendations on fisheries biology to the Technical Advisory Committee. The Biology Subcommittee will identify and recommend through the Technical Advisory Committee to the Consensus Committee, an individual to act as study coordinator to provide technical oversight of data collection and analysis by project biologist(s), including quality control of data acquisition, analysis and reporting and coordination between plan activities and the Biology Subcommittee. The Biology Subcommittee shall prepare and maintain a protocol for mutual consultation to assure active participation of all subcommittee members. The Biology Subcommittee shall notify other interested biologists of the meetings and determinations under consideration so that the views and opinions of such professionals are available for the purposes of this Memorandum of Understanding.

e. A subcommittee of the Technical Advisory Committee (referred to herein as the Hydrology Subcommittee) composed of representatives from the Santa Barbara County Water Agency, the Santa Ynez River Water Conservation District and the Cachuma Conservation Release Board shall make investigations, as they may, from time to time, agree are necessary.

f. The Technical Advisory Committee shall direct the work necessary to complete the studies approved by the parties. The Administrative Support Committee shall provide for services necessary for supervision of such work.

3. FINANCIAL ARRANGEMENTS The parties to this Memorandum of Understanding shall provide the staff, records, information, and technical assistance available from their respective jurisdictions to implement the Long Term Fisheries Study Plan (attached hereto as Exhibit A). In addition:

a. The Cachuma Conservation Release Board will provide, on an annual basis during the term of this Memorandum of Understanding, 89.7% of the funds required to conduct surveys, employ consultants, and for the copies, tools, equipment, supplies, travel, and other costs of the Long Term Fisheries Study Plan, according to budgets approved as provided herein.

b. The Santa Ynez River Water Conservation District, Improvement District No. 1, will provide, on an annual basis during the term of this Memorandum of Understanding, 10.3% of the funds required to conduct surveys, employ consultants, and for the copies, tools, equipment, supplies, travel, and other costs of the Long Term Fisheries Study Plan, according to budgets approved as provided herein.

c. The Santa Barbara County Water Agency shall provide funding for USGS stream gauging and water quality measurement, immediately downstream of Bradbury Dam.

d. The Administrative Support Committee may join, contract with, and/or obtain contributions from one or more public agencies, businesses or public benefit organizations for the operation, benefit and support of the work provided for herein.

e. The total to be expended to conduct surveys, employ consultants, and for the copies, tools, equipment, supplies, travel, and other costs necessary to complete the Study Plan, shall not exceed the sum of One Hundred Seventy Thousand and No/100 ($170,000.00) dollars in any calendar year, during the term of this Memorandum of Understanding, without the further separate approval of the governing boards of the Cachuma Conservation Release Board and the Santa Ynez River Water Conservation District, Improvement District No. 1.

f. It is the intention of the parties to account for the costs, expenses and charges for services on the Santa Ynez River provided by the National Marine Fisheries Service, U.S. Fish and Wildlife Service, and other federal agencies as participate. Each participating federal agency shall provide sufficient account of such contributions and charges, at least annually, to permit a full declaration of such contributions.

4. ADMINISTRATION The parties agree that there will be an Administrative Support Committee composed of one staff member from each of the following agencies: the City of Santa Barbara, the Montecito Water District and the Santa Ynez River Water Conservation District, Improvement District No. 1. The Administrative Support Committee shall, acting together, coordinate budgets for this Memorandum of Understanding; provide for project management for the Technical Advisory Committee; administer the contracts for consultants hired for the work provided herein; and give notices, distribute documents, keep minutes, provide for meeting space, and perform such other administrative and coordination needs as the Consensus Committee and the Technical Advisory Committee may, from time to time, require. The Administrative Support Committee shall appoint an Administrator for direct support for the work undertaken by this Memorandum of Understanding. The Administrative Support Committee shall cause the studies, surveys, reports and material regarding the Santa Ynez River to be prepared through contractors, agency employees, and such other means as they shall deem appropriate. The Administrator shall keep records of financial transactions on a generally recognized accounting basis and such records shall be maintained for a period of 3 years following the completion of the work assigned. The Administrator shall provide copies of materials developed, agendas, minutes, and other significant deliverables to the California State

Water Resources Control Board staff as part of the work to complete the Long Term Fisheries Study Plan.

5. DEVELOPMENT OF LONG TERM AGREEMENT The parties to this Memorandum of Understanding intend to develop information for, and to work toward, a long term agreement about any fishery below the Bradbury Dam.

a. The parties to this Memorandum of Understanding will convene as reasonably necessary in view of the ongoing nature of the Long Term Fisheries Study Plan, to discuss a long term agreement for the fishery below Bradbury Dam.

b. The parties shall cooperate in an effort to carry out the Long Term Fisheries Study Plan for the period between January 1, 1996 and December 1, 2000 and to resolve differences over provisions for the fishery below Bradbury Dam by agreement for such further period as to which this Memorandum of Understanding may be extended.

c. The parties agree to meet to discuss the Long Term Fisheries Study Plan, and related agreement(s), at least one time per year during the period of this Memorandum of Understanding and any extension thereof. Unless another date is selected by the Chair of the Technical Advisory Committee, and notice provided of such alternate date, the parties shall meet on the first Wednesday of October.

d. If the parties are unable to reach agreement on issues related to matters that are reviewed in the Long Term Fisheries Study Plan they shall prepare a stipulation regarding those areas in which they are in agreement and, by joint presentation, submit the remaining issues as appropriate for resolution by the California State Water Resources Control Board in accord with the rules and procedures of that Board.

6. IMPLEMENTATION The parties to this Memorandum of Understanding shall use their best efforts to ensure that the activities outlined in this Memorandum of Understanding are carried out in accordance with the recommendations provided by the Technical Advisory Committee. In providing direction concerning this Memorandum of Understanding, the Technical Advisory Committee shall attempt to operate by consensus. However, in the event that a consensus cannot be reached, and for the sole purpose of carrying out the approved Long Term Fisheries Study Plan, the Administrator appointed by the Administrative Support Committee shall make final resolution of the issue. The decision of the Administrator shall be final, with no right to review or appeal.

7. FISH RESERVE ACCOUNT To facilitate cooperative study and to maintain fish in the Santa Ynez River below Bradbury Dam, the Bureau of Reclamation shall establish a Fish Reserve Account to store spill water within the Cachuma Project for use as provided herein for the maintenance of fish below Bradbury Dam and to carry out necessary studies provided for in the Study Plan.

a. The Fish Reserve Account shall be used by the United States Bureau of Reclamation as necessary to maintain any fish below Bradbury Dam. Such use shall be based upon recommendation of the Biology Subcommittee of the Technical Advisory Committee.

b. The Fish Reserve Account shall be established in an amount equivalent to the amount of water stored in the Cachuma Project above elevation 750 feet, in accord with this Memorandum of Understanding.

c. In the event that the Fish Reserve Account is insufficient for purposes of the Memorandum of Understanding, and on the advice of the Technical Advisory Committee, the

Bureau of Reclamation may make releases from the minimum pool of the Cachuma Project, up to an amount that shall not exceed 2000 acre feet in each calendar year during the term of this Memorandum of Understanding (and an equal amount during each and every one year extension hereof as may be approved), according to the same process as is provided for the Fish Reserve Account, without further consultation with the Consensus Committee. If the 2000 acre feet is insufficient to carry out the studies identified in the Long Term Fisheries Study Plan, the Biology Subcommittee may request additional amounts of water from the Cachuma Conservation Release Board and the Santa Ynez River Water Conservation District, Improvement District # 1, through the Consensus Committee. The balance of any water remaining unused from any previous year of this Memorandum of Understanding shall not be added to or carried over into a present year. The water dedicated for such purpose during any calendar year of the understanding shall be that water approved herein and available for that year.

d. In the event that a consensus cannot be reached on the Biology Subcommittee, and for the sole purpose of carrying out the provisions of this Memorandum of Understanding, the chairperson of the Technical Advisory Committee shall make final resolution of the issue of release of water in the Fish Reserve Account. The decision of the chairperson, regarding the recommended release, shall be final, with no right to review or appeal.

e. The Santa Ynez River Water Conservation District shall annually forecast its need for releases of water pursuant to decisions of the California State Water Resources Control Board, including, without reservation, WR 89-18 and WR 94-5. The Santa Ynez River Water Conservation District shall announce whether it intends to call for release of water in a calendar year, no later than the end of May of that calendar year, as provided under such orders. The Santa Ynez River Water Conservation District shall estimate the timing (duration) and the magnitude (acre feet) of the anticipated release to be required. The Santa Ynez River Water Conservation District shall cooperate with all parties to this Memorandum of Understanding in requesting water releases and in preparation of river studies of the Santa Ynez River. As the releases referred to in this subparagraph are reduced, the Santa Ynez River Water Conservation District shall coordinate with the Technical Advisory Committee to ensure that fishery resources are not adversely impacted by curtailment of the releases. Water released at the direction of the Santa Ynez River Water Conservation District shall be attributed to the credit obligations accruing under WR 89-18 and WR 94-5. The balance of releases which are carried out under this Memorandum of Understanding shall be from the minimum pool and the fishery reserve accounts as identified herein.

8. **FLASHBOARD MODIFICATIONS** The Bureau of Reclamation shall proceed forthwith to review the potential for modifying the flashboards of Bradbury Dam for the purpose of enhancing the yield of the Cachuma Project. The Bureau of Reclamation shall schedule meetings with all necessary personnel for the purpose of investigating the feasibility of modifying the flashboards in a manner which does not impair public safety. The Bureau of Reclamation will make all reasonable effort to obtain approval for the flashboard modifications. Any water captured by virtue of the modified flashboards shall be added to the Fish Reserve Account as provided for in Section 7, hereof, and it shall be subject to use as provided above.

9. **DEPARTMENT OF FISH AND GAME** The California Department of Fish and Game shall provide technical expertise and assistance in developing information and implementing alternatives which will maintain fisheries, subject to its funding capabilities and its annual appropriations. Nothing in this Memorandum of Understanding shall be interpreted

to supersede the jurisdiction and responsibilities of the Department of Fish and Game under existing State laws, regulations, codes and policies of the Fish and Game Commission and the Department of Fish and Game.

10. U.S. FISH AND WILDLIFE SERVICE Nothing in this Memorandum of Understanding, including, but not limited to Sections 2, 3, 5, 6, and 7, hereof, shall be interpreted to supersede or interfere with the jurisdiction and responsibilities of the U.S. Fish and Wildlife Service under Section 7 of the Endangered Species Act and other applicable federal laws to evaluate independently the effects of federal agency actions connected with the Cachuma Project on federally listed threatened and endangered species and other fish and wildlife resources.

11. TERM This Memorandum of Understanding shall remain in full force and effect for the term beginning January 1, 1996 and ending December 1, 2000 and may be extended for successive one year terms ending December 1, upon the mutual approval of the parties who wish to continue the understanding. This Memorandum of Understanding shall be effective as to the Cachuma Conservation Release Board and upon the Santa Ynez River Water Conservation District, Improvement District No. 1 upon execution by those agencies and the approval of both: the California Department of Fish and Game and the United States Bureau of Reclamation.

12. PRIMARY FORUM All parties to this Memorandum of Understanding shall use their best efforts and good faith to develop information concerning fisheries through the provisions of this Memorandum of Understanding and by the Technical Advisory Committee as provided herein. The parties desire to have the arrangements in this Memorandum of Understanding operate as the primary forum for resolution of issues related to maintaining fish, and agree:

a. The parties will use their best efforts to cooperate in the development of related information in each process to avoid overlap and duplication in other processes, including, but not limited to the Cachuma Project Contract Renewal, and future proceedings before the State Water Resources Control Board on the Santa Ynez River.

b. The parties reserve their present rights and contentions related to or arising out of the impoundment and/or release of water in or through the Cachuma Project, and the impact and/or mitigation of impacts of such impoundment and/or releases of water upon fish and fish habitat in Lake Cachuma and downstream of Bradbury Dam in the Santa Ynez River, during the term of this Memorandum of Understanding, including any extension. Nothing in this Memorandum of Understanding (or in the Long Term Fisheries Study Plan) is intended to be, nor shall be taken to be, an admission regarding, or waiver of, such rights and contentions.

13. ACCESS TO INFORMATION Each of the parties to the Memorandum of Understanding shall have access to and right to use and publish any and all information, data, summaries, charts, programs and other material developed for the Santa Ynez River area. All information will be gathered, distributed and maintained in a manner to assure freedom of access and use for such material. None of the parties nor any administrators to this understanding shall be individually responsible to perfect or to defend such rights of use or access. The data collected pursuant to this Memorandum of Understanding may be referred to, used and presented, to the extent it is timely available, as part of the normal course of public hearings associated with the use or operation of the Cachuma Project and/or Santa Ynez River resources.

14. COUNTERPART ORIGINALS This agreement may be executed in one or more counterparts and each counterpart shall be evidence of participation.

15. PROJECT BUDGETS The Administrator shall prepare annually an operating budget (not to exceed $170,000) for approval by the Consensus Committee. Before presentation to the Consensus Committee, the Administrator shall meet with and advise the Technical Advisory Committee as to the details of the proposed budget and shall present the comments of the Technical Advisory Committee to the Consensus Committee. The Administrator shall operate thereafter in accord with the budgets approved by the Consensus Committee.

16. NO WARRANTY FOR LEGAL DEFENSE Services in legal defense of the study plan, the releases of water made herein, or in legal defense of the environmental material prepared pursuant to this Memorandum of Understanding, and other services that may be required by reason of challenges made or to be made to the project (which may include challenges on environmental grounds), are beyond the scope of service to be provided herein. Each party specifically reserves the right to participate or not participate in any such defense or challenge, from time to time, or to any extent at all, at the discretion of that party.

17. AMENDMENT This agreement may be amended, from time to time, with the written consent of all parties.

18. NO INDEMNITY No participant to this Memorandum of Understanding nor any officer or employee thereof shall be responsible for any damage or liability occurring by reason of anything done or omitted to be done by another party under or in connection with any work, authority or jurisdiction delegated to the other party under this Memorandum of Understanding.

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1

By_____

CALIFORNIA DEPARTMENT OF FISH AND GAME

By_____

CACHUMA CONSERVATION RELEASE BOARD

By_____

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

By_____

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SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1

By Thomas M. Peterson

CALIFORNIA DEPARTMENT OF FISH AND GAME

By_____

CACHUMA CONSERVATION RELEASE BOARD

By_____

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

By_____

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SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1

By_____

CACHUMA CONSERVATION RELEASE BOARD

By C. Charles Evans

CALIFORNIA DEPARTMENT OF FISH AND GAME

By_____

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

By_____

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IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the day and year first above written.

SANTA YNEZ RIVER WATER CONSERVATION DISTRICT, IMPROVEMENT DISTRICT NO. 1

By_____

CALIFORNIA DEPARTMENT OF FISH AND GAME

By_____ 7/6/96

CACHUMA CONSERVATION RELEASE BOARD

By_____

CALIFORNIA SPORTFISHING PROTECTION ALLIANCE

By_____

UNITED STATES BUREAU
OF RECLAMATION

By _____

UNITED STATES FISH
AND WILDLIFE SERVICE

By _____

CITY OF LOMPOC

By _____

CALIFORNIA TROUT, INC.

By _____

SANTA YNEZ RIVER WATER
CONSERVATION DISTRICT

By _____

SANTA BARBARA COUNTY
WATER AGENCY

By _____

NATIONAL MARINE FISHERIES
SERVICE

By _____

URBAN CREEKS COUNCIL

By _____

RWP\MOU\FISH\March18,96

UNITED STATES BUREAU
OF RECLAMATION

By_____

SANTA YNEZ RIVER WATER
CONSERVATION DISTRICT

By_____

UNITED STATES FISH
AND WILDLIFE SERVICE

By Diane K. Noda

SANTA BARBARA COUNTY
WATER AGENCY

By_____

CITY OF LOMPOC

By_____

NATIONAL MARINE FISHERIES
SERVICE

By_____

CALIFORNIA TROUT, INC.

By_____

URBAN CREEKS COUNCIL

By_____

RWP\MOU\FISH\March18.96

UNITED STATES BUREAU
OF RECLAMATION

By_____

UNITED STATES FISH
AND WILDLIFE SERVICE

By_____

CITY OF LOMPOC

By Joyce Howerton
Mayor Joyce Howerton

CALIFORNIA TROUT, INC.

By_____

SANTA YNEZ RIVER WATER
CONSERVATION DISTRICT

By_____

SANTA BARBARA COUNTY
WATER AGENCY

By_____

NATIONAL MARINE FISHERIES
SERVICE

By_____

URBAN CREEKS COUNCIL

By_____

RWP\MOU\FISH\March18,96

UNITED STATES BUREAU
OF RECLAMATION

By_____

UNITED STATES FISH
AND WILDLIFE SERVICE

By_____

CITY OF LOMPOC

By_____

CALIFORNIA TROUT, INC.

By_____

SANTA YNEZ RIVER WATER
CONSERVATION DISTRICT

By Naomi Schwartz

SANTA BARBARA COUNTY
WATER AGENCY

By_____

NATIONAL MARINE FISHERIES
SERVICE

By_____

URBAN CREEKS COUNCIL

By_____

RWPMOU\FISH\March18.96

APPROVED AS TO FORM:

STEPHEN SHANE STARK
COUNTY COUNSEL

By: Mary Ellen Bundock
DEPUTY

ATTEST
ZANDRA CHOLMONDELEY
Clerk of the Board of Supervisors

By: Elizabeth Madding
Deputy Clerk

UNITED STATES BUREAU
OF RECLAMATION

By_____

UNITED STATES FISH
AND WILDLIFE SERVICE

By_____

CITY OF LOMPOC

By_____

CALIFORNIA TROUT, INC.

By_____

RWP\MOU\FISH\March18.96

SANTA YNEZ RIVER WATER
CONSERVATION DISTRICT

By Naomi Schwartz

SANTA BARBARA COUNTY
WATER AGENCY

By_____

NATIONAL MARINE FISHERIES
SERVICE

By_____

URBAN CREEKS COUNCIL

By_____

APPROVED AS TO FORM:

STEPHEN SHANE STARK
COUNTY COUNSEL

By: Mary Ellen Bamford
DEPUTY

ATTEST
ZANDRA CHOLMONDELEY
Clerk of the Board of Supervisors

By: Elizabeth Madden
Deputy Clerk

UNITED STATES BUREAU
OF RECLAMATION

By_____

SANTA YNEZ RIVER WATER
CONSERVATION DISTRICT

By J. B. Fil

UNITED STATES FISH
AND WILDLIFE SERVICE

By_____

SANTA BARBARA COUNTY
WATER AGENCY

By_____

CITY OF LOMPOC

By_____

NATIONAL MARINE FISHERIES
SERVICE

By_____

CALIFORNIA TROUT, INC.

By_____

URBAN CREEKS COUNCIL

By_____

RWP\MOU\FISH\March18.96

INVESTIGATIONS TO DETERMINE FISH-HABITAT MANAGEMENT ALTERNATIVES for the LOWER SANTA YNEZ RIVER SANTA BARBARA COUNTY

Approved by
SANTA YNEZ RIVER CONSENSUS COMMITTEE

MARCH 1996

EXHIBIT A

PREFACE

Since 1993, the U.S. Bureau of Reclamation, California Department of Fish and Game (DFG), U.S. Fish and Wildlife Service (FWS), and various water project operators have been party to a "Memorandum of Understanding (MOU) for Cooperation in Research and Fish Maintenance" on the Santa Ynez River, downstream of Bradbury Dam ("lower river"). Parties to the MOU maintain a Technical Advisory Committee (TAC) whose ultimate goal is to "develop recommendations for long term fishery management, projects and operations" in the lower river.

The TAC was established in response to State Water Resources Control Board (SWRCB) actions dealing with Bradbury Dam and the lower Santa Ynez River that culminated in the SWRCB requesting flow recommendations for maintenance of public trust resources in the lower river. It was also established to broaden the scope of management options potentially available to protect public trust resources within the lower river, to attempt to accommodate the needs of all interested parties, and ultimately develop mutually acceptable management actions. Since 1993, the TAC has worked from year to year to undertake a variety of studies of the lower river. Over time it has become recognized by all parties and the SWRCB that there is a need for a longer-term study plan that will provide additional technical information to policy makers. The present study plan is intended to serve that purpose.

The waters of the Santa Ynez River are put to a variety of uses, including the maintenance of public trust resources both within Lake Cachuma and downstream of Bradbury Dam, as well as consumptive urban and agricultural uses within the Santa Ynez Valley and along the coastal plain encompassing the City of Santa Barbara and its urban environs. Competition for water from the river among these various uses is the primary impetus for the TAC's existence. Water management, urban encroachment, agriculture, flood control, and gravel mining have all raised concerns over the condition of the public trust resources of the lower river. The existence of these activities has also raised concern about the economic and social impacts of efforts to significantly alter the existing flow regime of the river.

In order to respond to concerns about providing a reasonable balance in the allocation of Santa Ynez River water between public trust resources and competing consumptive uses, as well as between public trust resources within Lake Cachuma and public trust resources downstream of Bradbury Dam, it is important to undertake a series of studies that will provide the technical basis for well-grounded policy decisions. These studies will be devoted to acquiring technical information regarding:

1. The diversity, abundance, and condition of existing public trust fishery resources within the lower river;

2. Conditions which may limit the diversity, abundance, or condition of public trust fishery resources within the lower river;

3. Non-flow measures which could be expected to improve the conditions that currently act to limit the diversity, abundance, or condition of public trust fishery resources within the lower river; and

4. Alternatives to the existing operational regime of the Cachuma Project which could be expected to improve the conditions that currently act to limit the diversity, abundance, or condition of public trust fishery resources within the lower river.

In this regard, it is anticipated that the studies described herein will serve as the technical basis for recommended management of the Santa Ynez River and the Cachuma Project. It is also anticipated that the studies described as part of this plan will help promote a reasonable balance of public trust resources and a secure water supply for the consumptive urban and agricultural users dependent upon Santa Ynez River water. To this end, the studies described herein are designed to develop the information necessary to permit the TAC to recommend measures that will be considered and evaluated by the Consensus Committee to recommend specific management measures to the SWRCB for the purpose of achieving a reasonable allocation of Santa Ynez River water between public trust resources and competing consumptive uses consistent with the goals and objectives outlined below.

GOALS AND OBJECTIVES

STUDY GOAL

The goal of this study is to identify reasonable flow and non-flow measures that will improve habitat conditions for fish populations in the lower Santa Ynez River within the context of overall management objectives and competing demands on the Santa Ynez River.

STUDY OBJECTIVES

The study objectives are to develop technical information concerning:

1. The diversity, abundance, and condition of existing public trust fishery resources of the lower Santa Ynez River;

2. Conditions – habitat quantity and quality, including water quantity and quality – which may limit the diversity, abundance, or condition of public trust fishery resources of the lower river;

3. Non-flow measures which could be undertaken to change existing conditions that act to limit the diversity, abundance, or condition of public trust fishery resources within the lower river; and

4. Alternative flow regimes for the Cachuma Project which could be expected to change the conditions that currently act to limit the diversity, abundance, or condition of public trust fishery resources within the lower river.

MANAGEMENT OBJECTIVES

Identification and evaluation of potential alternative management actions will be based, in part, on the following objectives:

- Improve habitat conditions to maintain fish populations in good condition;
- In particular, protect, maintain, and improve habitat conditions for species listed under the State and Federal endangered species acts or identified as California Species of Special Concern;
- Improve the availability and suitability of stream corridor and channel habitat for a diversity of species of fish and wildlife.

Alternative management recommendations will be developed and evaluated in context with other management objectives for the river. The comparative feasibility of various alternative management actions in achieving these management objectives will be evaluated with respect to the following criteria:

- The proposed management action has a high probability of achieving the desired benefit;
- The management action can be reasonably implemented considering the constraints imposed by natural hydrologic conditions.

BACKGROUND

This study plan has not been developed in isolation. It is part of continuous studies undertaken on the Santa Ynez River and financed by water user interests since 1993. It is anticipated that data acquired as part of those earlier studies will also be used to achieve the study and management objectives described above. Since 1993, these studies have included: (i) water temperature and dissolved oxygen (DO) monitoring in Lake Cachuma and in the lower river from the stilling basin below Bradbury Dam to the lagoon; (ii) habitat quality evaluations in both the lower river and its tributaries; (iii) flow requirements for fish passage in the lower river; and (iv) fish population surveys in both the lower river and its tributaries (SYRTAC 1994, 1995).

Data collected from these studies were analyzed for inclusion in the Cachuma Project Contract Renewal EIR\EIS to describe the status of existing fish resources, existing fish species habitat requirements and conditions, potential factors limiting fish populations, and to allow a comparison of the potential effect of proposed alternatives. A number of analytical techniques used for the preparation of the EIR\EIS are applicable to the current study and may provide a basis for the analytical design.

This proposal promotes the continuation of some of the ongoing investigations, cessation of studies that have already provided sufficient information within the context of this plan, addition of investigations required to augment existing information, and implementation of investigations necessary to support the analytical component of this plan's objectives.

GENERAL APPROACH

The relationship between habitat quality and quantity and instream flow will be determined by integrating channel conditions and fish use information within the framework provided by a flow-habitat model. Fish use will be monitored in various channel conditions, or habitat types, under different flow regimes over a study period of nearly four years. Different flow regimes could result from natural variation in hydrology augmented with Fish Reserve Account releases and potential modifications in routine operations at Bradbury Dam. The Physical Habitat Simulation model (PHABSIM), developed by the FWS (Bovee 1982), will be used to relate fish use and habitat quantity and quality to flow. Consideration is also given in the study plan to continue stream temperature monitoring and modeling in addition to monitoring other water quality parameters such as dissolved oxygen that affect habitat quality.

Fish use and habitat information will be developed using a stratified sampling approach. Strata will be based upon large-scale features such as gradient, substrate and accretion (reaches) and small-scale geomorphological features (habitat types). Habitat types will be selected from each reach to determine function. Similarly, flow-habitat modeling sites will be selected from habitat types based upon function. Surveys of habitat availability and fish use (e.g., species composition, diversity, abundance, condition, and reproductive success) will include both the lower Santa Ynez River main stem and major tributaries.

Based upon results of the fisheries and water quality monitoring proposed as part of this study plan, various alternative management strategies can be developed and the associated biological benefits, operational feasibility and constraints, and potential adverse impacts to public trust resources and water supplies of the Santa Ynez River system can be evaluated. Results of these technical studies will provide the necessary foundation for developing a reasonable and balanced management program for the Santa Ynez River.

STUDY PLAN

JOB 1. Stream reach and habitat inventory

OBJECTIVE: To identify major stream reaches and determine distribution, abundance and quality of mesohabitats(e.g., riffles, pools, etc.) throughout the lower Santa Ynez River.

PURPOSE: This information will be used to systematically subsample habitats within stream reaches for detailed investigation of fish-habitat relationships and to identify habitat quality with the potential for habitat restoration.

PROCEDURES: Two levels of stratification will be used to inventory available habitat throughout the lower main stem. The first level consists of determining the major reaches of the main stem with regard to channel morphology. The TAC has already broken down the main stem into three major reaches for the fish passage study conducted in May 1995. These reaches correspond approximately to those described by Shapovalov (1946) with regard to substrate quality and steelhead/trout spawning: mouth to Salsipuedes Creek, Salsipuedes Creek to Solvang, Solvang to Bradbury Dam, with substrate quality increasing from downstream to upstream. Each tributary[1] should also be broken down into major reaches, e.g. a high-gradient, boulder-controlled upper section vs. a low-gradient, alluvial lower section.

Habitat types will be determined in each reach to achieve the second level of stratification. A modified DFG habitat survey methodology (Flosi and Reynolds 1991) will be used where the principal habitat component is mesohabitat, i.e., pool, riffle, run, etc. Habitat typing of the main stem will be done using the aerial photographs taken in April 1995. Individual habitat units will be numbered from downstream to upstream. While ground truthing selected units, data on habitat attributes will be collected following the instructions in Appendix 1.

SCHEDULE: Habitat typing of the main stem from photographs, and ground truthing of selected units, will be done during March–April 1996.

JOB 2. Habitat function as reflected by fish use

OBJECTIVE: Identify the potential function of available habitats within the mainstem Santa Ynez River and its tributaries with regard to spawning, rearing, migration, species abundance, diversity and spatial and temporal distribution.

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[1] Tributaries included for consideration based upon preliminary survey results dealing with flow and other habitat attributes are Alisal, Hilton, Nojoqui, Quiota, and Salsipuedes-El Jaro creeks.

PURPOSE: This information will be used to locate transects for modeling flow-habitat relationships (PHABSIM) and determine habitat condition including potential for restoration. The migration component will also determine influences of flow and habitat condition on fish movement. Results of these surveys will also provide data on the species composition, abundance reproductive success and condition of the fish populations inhabiting the Santa Ynez River downstream of Bradbury Dam.

PROCEDURES AND SCHEDULES: A table of random numbers will be used to select four pools, and a minimum of three riffles and three runs, from each reach. These units will be sampled systematically to assess their function as spawning and rearing habitat.

Spawning: Selected habitat units will be monitored once a week from December through May, when flow conditions provide for migration and spawning. Units will be checked for spawner use/non-use by looking for spawning activity or recently constructed redds. The location of redds will be marked with rebar and flagging. Water depth and average column velocity will be measured at three locations over undisturbed gravel adjacent to the redd.

Rearing: Abundance estimates will be made for each fish species in each unit once a month. Abundance estimates in pools and runs will be made by direct observation (Helfman 1983), when appropriate. Each unit will be traversed by snorkeling at least twice with a minimum of two observers. Each observer will be assigned a "sample lane," the width of which is dependent on water clarity. Lane width will be determined using the "fish-on-a-stick" method. A 10 cm long facsimile of a fish will be attached to the end of a stick and gradually moved away from the underwater observer until the fish disappears. The distance from the observer to the point where the fish reappears is the maximum lane width. Lane width can be narrower than the maximum if the total habitat unit width is less than the sum of the designated lanes; i.e. (no. observers . maximum lane width) < (total habitat unit width). Observers maintain proper lane width and traverse the habitat, from downstream to upstream, counting fish by species and 25 mm size classes, within their respective lanes. At least two passes will be made with a short (30 minute) interval between passes. To calibrate the direct observation counts (when possible), fish abundance will be estimated in two or more pools per reach and monthly sample period by electrofishing (see below).

The following data will be collected: date; time; reach; habitat number and type; specific location; no. of each species by size class, by pass, and by lane; length of habitat sampled; lane width, maximum lane width (fish-on-a-stick distance), and number of lanes; and duration of each pass. Habitat measurements will be made according to the data sheet in Appendix 1.

Riffles and runs too shallow to snorkel will be sampled by electrofishing.

-The habitat unit will be isolated by placing a block net at its upstream and downstream end. The multiple-pass removal method (at least three passes) will be used to make abundance estimates. For each pass, all fish will be counted by species, and all trout will be measured (nearest 0.5 mm fork length, nearest 0.1 g wet weight). Each trout will also be classified by life stage, using the following criteria. *Fry* are newly-emerged fish, typically with at least a vestige of their yolk sac ("unzipped",or not "buttoned up"). *Parr* are darkly pigmented fish with characteristic oval- to round-shaped parr marks on their sides. *Silvery parr* have faded parr marks and a sufficient accumulation of purines in the scales to produce a silvery, but not fully smolted, appearance. *Smolts* have highly faded parr marks, or lack them altogether, a bright silver or nearly white color, and deciduous scales. During November–June, trout will be checked for ripe gonads by applying pressure to the abdomen. If milt or ova are extruded, the corresponding sex of the fish will be recorded. Scales will be collected from all collected trout, up to 10 trout per 25 mm size group per habitat type per sample period. At least two pools per reach and sample period will be sampled by seining or electrofishing to obtain information on individual trout. Any trout killed incidentally will be preserved in 95% ethanol for eventual otolith or other analysis.

Migration: Transect selection and stage and velocity versus discharge data collection to evaluate fish passage conditions were begun in May 1995 at several sites in the main stem where barriers to fish passage likely develop under low-flow conditions. Sites were selected from the aerial photographs taken in April 1995.

Adult and juvenile steelhead/trout movements in relation to flow conditions will be monitored at key locations throughout the lower river system. Two-way trapping will be conducted on the main stem at a suitable location between the lagoon and Solvang; that is, downstream from the predicted primary spawning area. Two-way trapping will also be conducted in Hilton, Salsipuedes, El Jaro, Alisal, Nojoqui, and Quiota creeks. Traps will be installed before 1 January so that the start of both adult immigration and juvenile emigration will be bracketed. Tributaries will continue to be trapped into summer until trout movements cease. A staff gage will be installed near each tributary trap, and discharge will be measured at various flow levels to develop a standard curve. The mainstem trap will be maintained for as long as flow is continuous to monitor trout movement during the rainy season, WR 89-18, and Fish Reserve Account releases.

The following data will be collected: trap name or number; starting and ending date and time of trapping; staff gage elevation; estimated proportion of flow fished by the trap; trout length, weight, life stage, and sex, as described above; counts, lengths and condition of other species by life stage. A portion of the adipose fin will be clipped on all trout during their initial observation in a trap, and subsequent recaptures recorded. Scales will be collected from all adult trout and processed by TAC biological subcommittee representatives to evaluate life-

history traits (e.g., growth, migratory history, etc.).

JOB 3. Habitat-flow relationships for spawning, rearing, and migration

OBJECTIVE: Model the relationship between stream flow and habitat quality and quantity for each fish species life-stage function.

PURPOSE: Results of this model will be combined with empirical information on habitat use to develop stream-flow versus habitat availability relationships. These relationships will provide the basis for determining flow requirements for various species-life stages and eventually an important analytical tool for evaluating various management actions, including associated flow regimes and habitat restoration.

PROCEDURES: Survey transects will be established in each habitat unit for modeling flow-habitat relationships using PHABSIM (Bovee 1982). Data will be collected for model building at representative spawning and rearing habitat units under low, moderate, and high flow conditions. Data regarding fish passage were collected at two flow levels during May and June 1995. The same protocol for data collection used at the passage study sites will be used at the spawning and rearing units.

Development of suitability criteria for existing species will be included within the framework of examining habitat-flow relationships. To minimize cost and labor, suitability criteria may be developed by reviewing published criteria for other streams, requesting input from qualified personnel, and by reaching consensus within the TAC. In those cases where consensus cannot be achieved, focused field data collections may be required to resolve differences. Alternatively, a range of suitability criteria sets could be used to bracket conditions and comparative analysis of estimated habitat conditions could be performed.

SCHEDULE: These data collections will occur opportunistically during the ensuing study period as flow conditions allow.

JOB 4. Temperature modeling and dissolved oxygen (DO) monitoring

OBJECTIVE: Model the relationship between temperature and stream flow, channel conditions, and other manageable influences on water temperature. Determine the seasonal and geographical distribution of water temperature and DO for various fish species life stages.

DO monitoring will address three specific problem areas: seasonal DO depressions that may affect the quality of fish habitat in the main stem of the lower river; the extent of diel DO depressions in refuge pool habitat; and determine DO profiles in Cachuma Reservoir that may affect downstream

resources through flow releases.

PURPOSE: This information will be used to evaluate various management actions on the temperature and DO conditions within the lower river. Influences of flow regime and habitat/channel restoration will be evaluated relative to achieving water temperature and DO criteria.

PROCEDURES: Data collected to date in the water temperature monitoring network, including temperature profile of Lake Cachuma, will be evaluated. Future data collection will be designed for use in an appropriate temperature model. This model will allow integration of flow, channel geometry, and various other, manageable influences on temperature with meteorological conditions to identify and evaluate potential temperature management actions.

Seasonal trends in DO concentrations will be determined. Two or three long-term monitoring stations will be established in areas with suitable rearing habitat (preferably at existing temperature monitoring stations).

To assess the extent that DO concentrations may be limiting refuge habitat, vertical profiles of DO concentrations will be determined in at least six deep pools downstream of Bradbury Dam (including the stilling basin, the long pool, and habitat units where cool water upwelling has been observed). Temperature and DO will be measured at one-foot intervals and will be conducted quarterly during two time periods: early morning and late afternoon.

Quarterly reservoir DO profiles will also continue to be conducted, along with temperature profiles as previously described.

DO data collected to date, both in Lake Cachuma and in the lower river, will be inventoried and evaluated for their utility in depicting both diel and seasonal trends. Future data collection will be designed, as to the frequency and location of sampling, based on the results of these baseline evaluations.

SCHEDULE: Data collected to date will be evaluated as soon as possible in 1996 following adoption of the long term study plan. Until decided otherwise by the TAC, the water temperature monitoring network and DO monitoring will be maintained as is in the main stem and tributaries on a continuous basis.

JOB 5. Tributary-main stem relationships

OBJECTIVE: Determine habitat use including quantity and quality in tributaries relative to dynamics of the fish populations within the lower river.

PURPOSE: This information will be used to assess the degree to which individual tributaries function as independent steelhead/trout rearing habitats by

-answering the following questions: Do steelhead/trout spawned in tributaries that typically dry up have a tendency to "escape" to the main stem as stream flow decreases and water temperature increases seasonally (see Erman and Leidy 1975)? Conversely, do those spawned in perennial tributaries remain there to rear until ready to emigrate? Can any significant benefit be gained from flow augmentation in tributaries, such as that proposed for Hilton Creek? How would habitat management activities in the tributaries influence overall management of the lower Santa Ynez River system including influences on flow and other potential modifications in the lower river?

PROCEDURES: The activities described in Job 2 will provide the data necessary to evaluate the habitat use in the tributaries. Trapping will detect the movement of spawners in the stream. Redd monitoring in selected habitat units will determine the location of spawning activity. Snorkeling and electrofishing in the selected habitat units will provide abundance estimates on fry and parr over time as stream flow and water temperature change. Trapping will determine the magnitude and timing of emigration in relation to streamflow and temperature changes. Flow-habitat evaluations in Hilton Creek, the only tributary that potentially could receive flow augmentation, would be evaluated.

SCHEDULE: See schedules under Job 2.

JOB 6. Verification of habitat-flow relationships

OBJECTIVE: Verify streamflow relationships developed in Jobs 3 and 4.

PURPOSE: Determine if the streamflow versus habitat availability/use relationships based upon consideration of flow ranges (Jobs 3) and temperature conditions (Job 4) accurately predict the response in habitat conditions/use.

PROCEDURES: Seasonal, WR 89-18, and Fish Reserve Account releases from Bradbury Dam will be used to empirically verify flow versus habitat relationships identified for target fish species/life stages. The activities described in Job 2 will provide the empirical data necessary to evaluate the response of fish populations to potential changes in flow and temperature conditions. Special study elements (e.g. fish tagging) will be added if needed to answer specific questions.

SCHEDULE: Flow-habitat conditions will be evaluated as soon as practicable after completion of PHABSIM modeling.

JOB 7. Molecular genetic analysis of steelhead/rainbow trout

Tissue samples will be collected from adult rainbow trout/steelhead collected in the upstream trapping program, juvenile rainbow trout/steelhead collected during downstream migration trapping and electrofishing surveys for genetic analysis.

There are a number of analytical methods available that need to be evaluated for appropriateness in addressing specific questions. These methods are currently being researched for review by the TAC. Since the review will not be complete in time for approval of this proposed long-term study plan, a genetic analysis plan component will be included for future evaluation. These samples will be archived until the proper analytical method is determined.

JOB 8. Coordination and collaboration with other study activities

OBJECTIVE: Coordinate TAC studies with other investigations being conducted in the Santa Ynez River watershed, and to incorporate, as appropriate, pertinent data and results.

PURPOSE: Through coordination, eliminate redundancy in efforts, and through collaboration, attain results beyond the scope of the TAC study plan alone.

PROCEDURES: TAC members will gather information on other study activities being conducted in the Santa Ynez River watershed. Study objectives and methods will be compared with those of the TAC's study plan to identify potential duplication of effort or sources of supplemental information. For example, riparian vegetation monitoring along the lower river (mandated in the SWRCB's Water Right Order WR 94-5) may include a habitat mapping element that may overlap or complement that specified in this plan.

Further, the TAC and FWS biologists implementing field data collection will be available to collaborate in activities, with TAC approval, outside the scope of the long term study plan, but which may produce a result of mutual benefit to both TAC study objectives and those of the external agency. Examples are conducting whole or tissue collections of fish for genetics work, such as that being conducted by the Federal government in connection with the steelhead listing process; and DFG-directed management activities in the lower river, such as fish rescues.

SCHEDULE: These activities will be scheduled as they arise.

JOB 9. Annual reporting and evaluation

OBJECTIVE: Summarize and report study results, evaluate study plan implementation, and revise the study plan as needed.

PURPOSE: To keep information development up-to-date, and to provide the opportunity to make midterm evaluations and adjustments to the study plan, as necessary.

PROCEDURES: The TAC biologist will prepare a draft report that will summarize the results of the year's work through June 30 of each year. The draft report will undergo TAC review and comments will be incorporated to produce a final annual

-report. This review process will provide the TAC an opportunity to evaluate the efficacy of study elements in achieving their desired objectives, and to amend the study plan as needed in an attempt to improve or modify future studies.

SCHEDULE: The draft annual report will be due by 1 September of each study year, and review completed by 1 October. The final annual report and proposed changes to the study plan will be due by 1 November to the Consensus Committee.

JOB 10. Management action analysis

OBJECTIVE: Analyze the various, potential management actions relative to meeting the goals and objectives defined in this proposal and develop a technically-based management recommendation in the context of the evaluation criteria discussed above for consideration by the TAC.

PURPOSE: To summarize through analysis the results of the proposed study in the form of a range of potential management actions for fish populations within the lower Santa Ynez River system.

PROCEDURES: Analytical tools developed to evaluate habitat quantity and quality versus flow, and non-flow habitat, and temperature modifications will be used to identify various alternative management actions and predicted influences (both negative and positive) on fish habitat needs and other uses of the lower Santa Ynez River system. Various scenarios will be contemplated for optimizing fish habitat, including steelhead/trout restoration in the lower river and its tributaries, implementation of non-flow habitat improvements, tributary flow and non-flow habitat based improvements, minimal changes intended only to accommodate existing fish populations in the lower river and the maintenance of a steelhead/trout population in tributaries and the system upstream of Bradbury Dam, and no-action.

SCHEDULE: A final synthesis report detailing the approach and information used to identify a recommended management action will be completed through iterative review by the biological subcommittee and the TAC by November 1, 1998.

SUMMARY SCHEDULE FOR LONG-TERM STUDY PLAN

Job	Activity	Schedule	Investigator
Job 1: Habitat inventory	Habitat typing main stem	Mar–Apr 1996	DFG, TAC and FWS scientists
	Ground truthing main stem	Mar–Apr 1996	DFG, TAC and FWS scientists
Job 2: Habitat function	Redd survey	Feb 1996–May 1996, Dec 1996–May 1997, Dec 1997–May 1998	TAC and FWS biologists
	Juvenile rearing survey	Monthly, Mar 96–Jun 99	TAC and FWS biologists
	Main stem trapping	Nearly year-round, Jan 1996–Jun 1999	TAC and FWS biologists
	Tributary trapping	Jan 1996–summer 1996, Jan 1997–summer 1997, Jan 1998–summer 1998, Jan 1999–summer 1999	TAC and FWS biologists
Job 3: Habitat-flow relationships	Data collection for PHABSIM	Opportunistically with suitable flows	TAC and FWS biologists
	PHABSIM modeling	TBA following data collection	DFG, TAC and FWS biologists
Job 4: Temperature and DO work	Evaluation of data collected to date, model selection	ASAP following adoption of long term study plan	TAC and FWS biologists, Biology Subcommittee
	Further data collection	Continuously thru summer 1999	TAC and FWS biologists, Hanson Environmental
	Temp modeling	TBA	TBA
Job 5: Trib-mainstem relationships	Adult trapping, redd monitoring, juvenile surveys, emigrant trapping	See Job 2	See Job 2
Job 6: Flow verification	Water releases, Job 2 activities	Opportunistically, following development of recommended flows	TAC
Job 7: Genetic analysis of steelhead/rainbow trout	Collect tissue samples Determine proper methods	Opportunistically archive samples. No date for analyses	TAC
Job 8: Coordination and collaboration	Coordinating with other study activities in SYR	Ongoing, as information becomes available	TAC, TAC and FWS biologists
Job 9: Annual reporting	Reporting and evaluating each year's work	Annual reports and study plan changes due by 1 Nov 96–98	TAC and FWS biologists, TAC Biology Subcomm.
Job 10: Management action analysis	Final data synthesis, reporting, and analysis of management actions	Management alternatives due 1 Nov 98.	TAC

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APPENDIX 1.

Habitat Inventory Data Sheet and Measurements

HABITAT INVENTORY DATA SHEET

Stream											
Data Recorder:					Date:						page # ___ of ___
Reach #	Air T°		Data Collectors:		Water T°		Discharge:		Average Velocity:		
HABITAT MEASUREMENTS											
Habitat Unit #											
Habitat Unit Type											
Total Length											
Average Width											
Average Depth											
Maximum Depth											
PERCENT UNIT SHELTER (quartiles)											
% Unit Covered											
% undercut banks											
% swd (d<12")											
% lwd (d>12")											
% root mass											
% terrestrial veg.											
% aquatic veg.											
% white water											
% boulders											
% bedrock ledges											
Percent Canopy											
BANK COMPOSITION											
right bank dominant type											
% right bank vegetated											
left bank dominant type											
% left bank vegetated											
Bank composition types: 1. bedrock/rock 2. boulder 3. cobble/gravel 4. bare soil 5. grass 6. brush 7. trees											
SUBSTRATE COMPOSITION											
sand / silt / clay (circle one)											
gravel (0.08" - 2")											
small cobble (2"- 5")											
large cobble (5" - 10")											
boulder (>10")											

Habitat Inventory Measurements

1. Reach: use reach designations chosen for the stream flow evaluation.

2. Average velocity: measure at least 5 random point velocities within the habitat unit and calculate average.

3. Habitat unit number: numbers should be in sequential order beginning with 1 at the downstream most end of a reach.

4. Habitat unit type: riffle, pool, run.

   riffle: area of topographic high caused by deposition or concentration of cobble and gravel, water is shallower, faster moving and more turbulent than either a pool or run.

   pool: typically an area of scour characterized by deeper, slower moving water with bed materials typically finer than found in either riffles or runs.

   run: an area of neither active deposition or scour but transitional between riffles and pools, characterized by water moving faster than in pools but flow less turbulent than in riffles.

5. Total length: measure total length of habitat unit along the thalweg of the channel (deepest longitudinal segment of channel).

6. Average width: measure at least three channel widths within the habitat unit and calculate average.

7. Average depth: take at least three random depth measurements across the unit with a stadia rod and calculate average.

8. Maximum depth: enter the measured maximum depth for each habitat unit.

9. Percent unit shelter: enter the percentage (in quartiles) of the total unit occupied by structural shelter. Classify 100% of the cover (in quartiles) by the types of shelter indicated on the data sheet.

10. Percent total canopy: enter the estimated percentage of the water surface covered by the tree canopy in the overhead view of the unit.

11. Bank composition: enter the number for the bank dominant composition type from the list at the bottom of this section.

12. Substrate composition: enter a "1" for the dominant substrate and a "2" for the secondary substrate.