

**KINGS RIVER FISHERIES MANAGEMENT PROGRAM**

# **Five-Year Implementation Plan**

*Program Year 2007-2008*

**FINAL DRAFT**  
**Subject to Revision**

**Submitted to:**

*Executive Policy Committee*

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## *Preface*

This document is the eighth in a series of “Five-Year Implementation Plans” and is generally intended to act as a guide and reference document for the Kings River Fisheries Management Program. It is an interim work product of the Technical Steering Committee (TSC).

This plan contains specific activities and funding proposals for the 2007-2008 program year with a significant emphasis upon project implementation. As has been the case with each of the previous Five-Year Implementation Plans, the TSC welcomes, encourages and expects the Executive Policy Committee (ExCom) and the Public Advisory Group (PAG) to comment on and request modification to both specific elements being considered and the general approach being taken. The TSC will revise and reissue the Five-Year Plan at the direction of the ExCom and PAG.

The TSC would like to acknowledge and thank the PAG for the input that it has already given in helping shape this document. This Plan, the activities it proposes, and each of the previous documents have resulted from a consensus driven process, with each of the three participating agencies contributing its particular expertise and perspective. While continuing to recognize the long road ahead, the TSC feels that the process that this Five-Year Plan represents is positive and progressive.

# **KINGS RIVER FISHERIES MANAGEMENT PROGRAM**

## **Five-Year Implementation Plan**

### **Table of Contents**

<b>I.</b>	<b>Introduction.....</b>	<b>2</b>
<b>II.</b>	<b>Summary of Program Year (2006-2007) .....</b>	<b>5</b>
<b>III.</b>	<b>Proposed Budget (2007-2008) .....</b>	<b>10</b>
<b>IV.</b>	<b>New Elements (Capital) .....</b>	<b>11</b>
<b>V.</b>	<b>New Elements (Non-Capital) .....</b>	<b>13</b>
<b>VI.</b>	<b>Ongoing Elements (Capital).....</b>	<b>13</b>
<b>VII.</b>	<b>Ongoing Elements (Non-Capital) .....</b>	<b>14</b>
<b>VIII.</b>	<b>Ongoing Elements (Maintenance).....</b>	<b>16</b>
<b>IX.</b>	<b>Proposed Plan Elements (2008-2012).....</b>	<b>17</b>

### **List of Appendices**

- Appendix A. Description of Ongoing Elements (Capital).
- Appendix B. Description of Ongoing Elements (Non-Capital).
- Appendix C. Description of Ongoing Elements (Maintenance).
- Appendix D. List of Elements Considered.
- Appendix E. Lead Agency Designation for the Elements.

## **Section I: Introduction**

The Kings River Water Association (KRWA), Kings River Conservation District (KRCD), and California Department of Fish and Game (CDFG) approved the Kings River Fisheries Management Program Framework Agreement on May 28, 1999. The Framework Agreement includes a number of actions designed to protect and enhance fishery habitat within the lower Kings River. To help manage implementation of the various habitat enhancement measures, the Kings River Executive Committee (ExCom) authorized preparation of a Five-Year Implementation Plan to be prepared and updated each year by the Technical Steering Committee (TSC). The Five-Year Implementation Plan has been revised each year by the TSC, reflecting current information from the ongoing fishery monitoring studies and assessment of habitat enhancement actions, to:

- Provide guidance and a framework for implementing elements of the Framework Agreement;
- Define qualitative aquatic resource goals for the lower Kings River;
- Define qualitative aquatic resource goals for Pine Flat Reservoir;
- Identify compliance monitoring and status reporting to evaluate and document program performance and accomplishments;
- Serve as a “living document”, which will be reviewed and revised, as appropriate, each year based upon analysis of the previous year’s monitoring data, reevaluation of habitat enhancement priorities and opportunities, and identification of additional opportunities and constraints;
- Provide a basis to identify specific program priorities and develop technical recommendations for funding allocations; and
- Provide a forum for specific input and recommendations regarding program direction from both the ExCom and Public Advisory Group (PAG) through their review and comment on annual revisions to the Five-Year Plan.

One of the principle objectives of the Five-Year Plan is to provide a project management structure for reviewing and prioritizing proposed habitat enhancement activities, and implementation of other elements contained in the Framework Agreement. The Five-Year Plan is intended to provide a technical and scientific framework for identifying design criteria and priorities for determining the appropriate scale of habitat enhancement projects, linkages among potential projects to maximize biological benefits and reduce cost, identify priorities for habitat enhancement project locations, and identify potential opportunities for expanding enhancement projects through funding augmentation from collaborative grant applications for state, federal, and private funding sources. Therefore, one of the key objectives of the Five-Year Plan is to help ensure coordination and communication among

the parties involved in implementing various elements of the Framework Agreement, and to facilitate a process for reviewing and evaluating alternative actions for funding allocation and prioritization for implementation. The Five-Year Plan also provides a framework to identify the objectives and methods to be used to assess the overall response of trout and other species for use in evaluating achievement of the lower Kings River aquatic resource goals, as identified in the Framework Agreement. In developing the 5-Year Plan, the TSC evaluates a variety of alternative approaches each year for establishing goals for the enhancement program, and for evaluating program performance.

The Five-Year Plan provides a framework for the Kings River monitoring program used to evaluate specific enhancement activities within the context of overall goals and activities being implemented through the Framework Agreement. Results of monitoring and evaluation activities serve, in part, as the basis for the adaptive management element of the Framework Agreement (Section 1b) and for identifying changes in program priorities or the allocation of resources from one program element to another.

The 5-Year Plan for 2007-2008 will continue to focus on the enhancement of fish habitat in the lower Kings River. Specifically, the program will continue to implement the Fishery Habitat Master Plan (June 2004) titled “Fishery Habitat Enhancement Projects To Benefit Trout and Other Species in the Kings River Downstream of Pine Flat Dam (Fresno County, California).” The proposed enhancement projects are designed to address various habitat types such as spawning, rearing, hiding, and cover habitat for Rainbow Trout (Appendix A, Page 2). The life stages that are addressed by these projects include the egg, fry, juvenile, and/or adult life stages of Rainbow Trout. Other factors for the trout fishery (such as winter flows, river depth in winter, pool quantity and quality) will be addressed with future enhancement projects and when hydrologic conditions trigger exhibit D flows.

Challenges exist in understanding and describing the complexities associated with any fisheries system. As a result, the TSC underwent an effort to develop a conceptual model to communicate and organize the complexities involved. The model looks at recognized life stages and factors for the purpose of identifying projects and practices to be addressed by the Kings River Fisheries Management Program. The conceptual model is intended to be a living document that is periodically updated to reflect increasing knowledge of the Kings River System. The conceptual model and documents referenced in the development of the model are listed below:

Kings River Fisheries Management Program. 2004. Kings River Conceptual Model – Working Draft. Prepared by Technical Steering Committee. Fresno, CA.

Kings River Conservation District. 1997. Summary of Limiting Factors for Rainbow Trout and Studies/Plans for Future Enhancement Projects in the Kings River Downstream of Pine Flat Dam. In-house Rpt. No. 97-005. Fresno, CA.

Raleigh, R. F., T. Hickman, R. C. Solomon, and P. C. Nelson. 1984. Habitat Suitability Information: Rainbow Trout. U. S. Fish and Wildlife Service, Biol. Rpt. 82/10.60.

Trihey and Associates. 1992. Kings River Fisheries (5 volumes): Stream Temperature Modeling, Spawning Gravel Study, Instream Flow Study, PHABSIM Appendices, and Reservoir Temperature Report. Prepared for Calif. Dept. of Fish and Game. Fresno, CA.

In the remainder of the 5-Year Plan, Section II includes a Summary of Program Year 2006-2007 that provides a brief description and report of activities that took place in that program year. Section III describes the Proposed Budget for program year 2007-2008. Sections IV, V, VI, VII, and VIII describe the various new and existing capital, non-capital, and maintenance elements proposed for program year 2007-2008. Section IX outlines the TSC's current longer-range thoughts and vision regarding program years 2008-2012. In Appendix E, the lead agency responsible for implementing the specific elements of the 2007-2008 program year is listed.

The TSC is preparing a separate 2006-2007 Annual Technical Report as a companion to the Five-Year Plan. That document includes results of monitoring studies and evaluation of current habitat enhancement actions and is referenced in a number of 5-Year Plan sections. The Annual Technical Report serves as part of the scientific foundation for the review and preparation of the 5-Year Plan.

## **Section II : Summary of Program Year (2006-2007)**

The approach used in the 2006-2007 Five-Year Plan focused on implementation of the Fishery Habitat Master Plan. In previous years, the Five-Year Plan recommended implementation of a series of pilot capital habitat enhancement projects (such as side channel habitat, boulder placement, spawning gravel augmentation and construction of coves and jetties) and programmatic master-planning for future habitat projects.

The 2006-2007 Five-Year Plan's focus was on:

- A programmatic review of scientific information collected in the previous monitoring program to evaluate alternative habitat enhancement strategies and alternative actions for implementation in subsequent years;
- Continued monitoring and evaluation of the fishery and habitat conditions (e.g., limiting factors, success of hatchery planting strategies, habitat suitability and use of enhancement areas, etc);
- Specific investigations and analyses to assess the condition of aquatic algae and macroinvertebrates within the river as the base of the food web supporting the Kings River fish community;
- Implementation of the Fishery Habitat Master Plan's enhancement actions such as spawning gravel placement, boulder placement, and channel ripping.

What follows is a brief summary of the concluding year's activities. Detailed descriptions and documentation of specific projects are kept by the agency most involved with that project.

### **Administrative Activities**

The Kings River Fisheries Management Program's seventh 5-Year Implementation Plan (for program year 2006-2007) was presented and approved by the Executive Committee at their meeting of September 28, 2006. That 5-Year Plan provided the basic direction for the Technical Steering Committee and program activities through the year.

The ExCom met three times during the program year (September 28, 2006, February 2007 and April 2007) to hear reports from the TSC and the public, and to provide direction to the TSC. The PAG, with Hank Urbach as Chairman, met on a monthly basis to discuss and develop issues important to them. Members of the TSC and ExCom routinely attend the PAG meetings to report on their activities and to provide input as requested.

## **Technical and Project Activities**

The TSC met as a group on an ongoing basis (generally once a month) during the program year. Using the 5-Year Plan as a guide map, the TSC focused their efforts on implementation of the various capital elements, monitoring tasks, long-term habitat project planning, and non-capital and maintenance elements.

### **Capital Elements:**

#### **C-2006-1      Fishery Habitat Master Plan Implementation**

The TSC continued reviewing the program and identified capital habitat enhancement actions for the future. The result was the development of a Fishery Habitat Master Plan (June 2004) that will guide fish habitat enhancement projects in the 2004-2010 period. The plan is titled “Fishery Habitat Enhancement Projects To Benefit Resident Trout and other Species in the Kings River Downstream of Pine Flat Dam (Fresno County, California).” The projects focus on an 9-mile river reach between the dam and Fresno Weir. Emphasis of the projects is on fish hiding cover, rearing and spawning habitat, and riparian planting of vegetation. Additionally, the “Kings River Conceptual Model” was developed (November 2004) to serve as a developmental framework in developing and discussing future enhancement projects.

All of these developments helped to shape the 2006-2007 program year. During the 2006-2007 program year, the following portions of the Fishery Habitat Master Plan were implemented:

#### *Channel Ripping*

The Fishery Habitat Master Plan (June 2004) proposed several sites of channel ripping to loosen hardened sediments and prepare the areas for boulder and gravel placement. During the 2006-2007 program year, ripping was not conducted, as the previous year’s activities were sufficient for placing boulders and gravel throughout the program year. Additional ripping will take place as necessary in future years at other sites as called for in the plan.

#### *Gravel Placement*

Due to the movement of gravel during the high-flow conditions of the spring and summer of 2006, the TSC elected to postpone additional gravel placement for the 2006-2007 program year until measures can be taken to protect from mass gravel movement downstream. Additional placement will take place in future program years, after extensive technical discussions within the TSC.

#### *Boulder Acquisition and Placement*

In spring and summer 2006, approximately 3,000 boulders were purchased and stockpiled at Avocado Lake County Park and at the Pine Flat Recreation Area for projects. During the fall and winter of 2006-2007, all 3,000 boulders from this year’s stockpile, were placed at sites at Avocado Lake County Park and the Pine Flat Recreation Area (sites B-1, B-2 and B-5). During the spring and summer of 2007, boulder stockpiling again took place to replenish supplies, with upwards of 4,000 boulders expected to be stockpiled by the end of the period. Additional placement at these and other sites will take place during the low-flow periods of the 2007-2008 program year.

- C-2006-4      Public Education  
Public Education efforts continued during the 2006-2007 program year. A Kings River Fisheries News newsletter was published and distributed in summer 2006 with the assistance of the PAG. Unfortunately, due to high water conditions, the third annual Kings River Day, a highly educational experience for over 600 sixth-graders in the Reedley area, was cancelled. This event is expected to be held again in May of 2007. Members of the TSC and PAG participate in this annual event.
- C-2006-5      Monitoring (Baseline, Project, and Special Study)  
With approval of the ExCom, a flow variance was issued to allow for electroshocking to take place during the 2006-2007 program year (November 7-9, 2006). The fourth Annual Technical Report (2005-2006) was drafted in the winter of 2006, and was approved by the PAG and the ExCom at the April 2007 meeting. Macroinvertebrate (insect) sampling results were received and analyzed. An upcoming Macroinvertebrate Sampling Report is in the draft stages. Water Quality sampling from the 2004-2005 program year was analyzed, and a draft Water Quality Report, including direction for future monitoring, was issued and presented at the September 28, 2006 meeting of the ExCom. Water Quality sampling continued in the 2006-2007 program year at Fresno Weir, supplementing the results from the Ag-Waiver Program. A Pilot Scale Telemetry Study began in the 2005-2006 program year, Phase II continued through the 2006-2007 program year, and results are currently being analyzed as the study continues into the 2007-2008 program year.
- C-2006-6      Technical Investigation Tour  
Unfortunately, due to scheduling conflicts, planned tours for the 2006-2007 program year were not undertaken. Future tours of similar river systems are still in the planning stages.
- C-2006-7      Reservoir Projects (Pine Flat Reservoir)  
In the winter of 2006-2007, CDFG along with the Army Corps of Engineers completed a project building gabions with Christmas Trees to be used as additional habitat for fish in the reservoir. Additional reservoir projects are planned for the 2007-2008 program year.
- C-2006-12     Study of Pool Habitat in the Lower Kings River  
The projects proposed for the 2006-2007 program year will be combined with element C-2006-13 into a single element (C-2007-15) as part of the 2007-2008 5-Year Plan.
- C-2006-13     Constructed Deep Water Habitat Pilot Project  
The projects proposed for the 2006-2007 program year will be combined with element C-2006-13 into a single element (C-2007-15) as part of the 2007-2008 5-Year Plan.

- C-2006-13     Large Woody Debris Project  
Little activity occurred during the 2006-2007 program year for this element. The TSC plans to make this project a priority in the 2007-2008 program year.

**Non-Capital Elements:**

- N-2006-1     Development of Exhibit D Flows  
KRWA's Exhibit D subcommittee met throughout the year and worked to develop the mechanisms to achieve higher fall and winter flows in the lower Kings River. Tentative internal agreements have been developed to enact the flows. The above-average (172%) water year of 2005-2006 resulted in the triggering of Exhibit D flows for the 2006-2007 water year for the second year in a row. KRWA members once again provided the enhanced flows throughout the low-flow time periods of the 2006-2007 year, even without internal agreements in place.
- N-2006-2     Continued Development of 5-Year Plan  
The TSC continues to work on development of the 5-Year Plan that is updated annually.
- N-2006-3     Investigation into Gift and Grant Opportunities  
Research into cooperative opportunities is ongoing, and will continue throughout the next program year (2007-2008).
- N-2006-4     Fish Passage Evaluation  
This is an element that the TSC plans to research and address in the future. The TSC discussed fish passage structures at the Dennis Cut in regards to operation of the headgate to provide required minimum flows. The TSC also discussed fish passage at the Mill Creek Gauging Weir, per element N-2006-10 during this program year. Past KRCD reports on fish passage at this structure were reviewed.
- N-2006-6     Development of a Fisheries and Habitat Improvement Plan  
The TSC, working with their agency staff and Public Advisory Group, developed a Fishery Habitat Master Plan for the period of 2004-2010. The plan is titled "Fishery Habitat Enhancement Projects To Benefit Resident Trout and other Species in the Kings River Downstream of Pine Flat Dam (Fresno County, California)." The projects focus on an 8-mile river reach between the dam and Gould Weir. Emphasis of the projects is on fish hiding, rearing and spawning habitat. A fishery plan for the entire project zone will be developed in the future.
- N-2006-10    Fish Passage Evaluation: Mill Creek Gauging Weir  
The TSC met and thoroughly discussed historical flow data at the Mill Creek site. It was determined by the TSC that historically there has been insufficient opportunity for spawning habitat to become available for fish who may use such a structure. As such, this element did not progress past Phase I (reconnaissance) and is deemed complete. This element will not appear in future 5-Year Implementation Plans.

## **Maintenance Elements:**

### **M-2006-1**     Thorburn Channel Maintenance

Spraying of weeds took place along the roadway and nature trail. The headgate was checked every one to two weeks for operation. After the high flows of the spring of 2006 receded, there was a large amount of accumulated debris that was removed in front of the headgate to allow for operation of the channel. The k-rail was checked for beaver dam-building activities and dams were removed.

### **M-2006-2**     Streamside Incubator Operation and Maintenance Thorburn Spawning and Rearing Channel Site

The streamside incubator located near the Thorburn Spawning and Rearing Channel was flooded during the spring releases from Pine Flat Reservoir. The pump was pulled from the vault before it was inundated, and then reinstalled when waters receded. This incubator suffered some damage to the suction line and the screen was lost. The suction was replaced during the flow variance of November 7-9, 2006. This incubator was used again in the winter and spring of 2006-2007.

#### Pine Flat Recreation Area Site

The incubator located downstream of Pine Flat Recreation Area was also inundated during spring 2006. Maintenance was completed after waters receded. Maintenance tasks included replacing the old pump with a more durable model, and installing a larger suction screen. This incubator was charged with rainbow trout eggs in the winter and spring of 2006-2007.

## Section III: Proposed Budget (2007-2008)

### Proposed Elements (Capital and Maintenance)

### 07-08 Funding Request

#### **New Elements (Capital)**

C-2007-15 .....Study of Pool Habitat and Constructed Deep Water Habitat Pilot Project.....\$20,000

#### **Ongoing Elements (Capital)**

C-2007-1 .....Fishery Habitat Master Plan Implementation .....\$115,500

C-2007-4 .....Public Education .....\$7,500

C-2007-5 .....Monitoring (Baseline, Project and Systematic) .....\$73,000

C-2007-6 .....Technical Investigation Tour .....\$500

C-2007-7 .....Reservoir Projects .....\$10,000

C-2007-14 .....Large Woody Debris Project .....\$5,000

#### **Ongoing Elements (Maintenance)**

M-2007-1 .....Thorburn Channel Maintenance .....\$10,000

M-2007-2 .....Streamside Incubator Operation and Maintenance .....\$2,500

#### **Kings River Fisheries Management Program (Administration)**

A1 .....Administration .....\$1,000

**Subtotal:.....\$245,000**

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## **Section IV: New Elements (Capital)**

One new capital element is proposed for program year 2007-2008. In reality, this is merely a combination of two previous elements (C-2006-12 and C-2006-13), but it will be represented as a new element. Below is a description of this element.

### **ELEMENT C-2007-15**

#### **STUDY OF POOL HABITAT AND CONSTRUCTED DEEP WATER HABITAT PILOT PROJECT**

##### **PURPOSE**

Section G (1) (f) of the Framework Agreement-Funding/Projects discusses fish habitat improvements to enhance fish and wildlife resources in the lower Kings River. Pools are an important habitat component of a river system and their abundance and quality can affect a fishery. In the program's Kings River Conceptual Model (2004), one of the possible limiting factors is pool habitat. Pool habitat is critical in the low flow season during the winter. Pool habitat is important to fry, juvenile, and adult trout.

To further improve habitat in the lower Kings River reaches, several sites will be improved with deep water habitat along the channel. This project will provide additional velocity refuges for both juvenile and adult trout. The addition of this habitat will help to increase trout survivability to juvenile trout and to the overall trout population. The velocity refuges will also provide escapement to both juvenile and adult trout during high flow periods.

##### **WORK PLAN**

A Kings River habitat survey was conducted from Pine Flat Dam downstream to Highway 180 in 2000 and a report was prepared by Beal, Ramsey, and Bromley (CDFG 2004). Results from that study are summarized in the FMP's Annual Technical Report (2002-2003). Using new GPS equipment and a better definition of "pool", the location of pools in this reach would be remapped, representative pools would be measured and mapped in 3-dimensional form, and data on pool cover-quality would be collected. This information would be used in a Habitat Suitability Index model (USFWS 1984) to evaluate the quality/suitability of pools in the lower Kings River for Rainbow Trout. Deliverables would be a topographic pool map, 3-D maps of representative pools, and a summary report evaluating the quality/suitability of pools for the lower Kings River. This information is needed to guide, locate, and design future projects to enhance pool habitat for trout.

The current concept involves the creation of deep water habitat by removing material from the river bed in sections 100 feet wide by 150 feet in length, at a depth that would be consistent with a Class A pool. A consultant will be hired to help with design specifications and to ensure the stability of the deep water habitat to prevent cutting and eventual loss of the created habitat. Additionally, a hydrologist will be consulted on in the selection of project sites. The initial project will involve the creation of two such sites; with the potential for development of more sites should the first two prove to be successful. For the current year, design and permitting would be the focus, with construction reserved for future program years.

### **ESTIMATED COST**

\$20,000 is proposed for program year 2007-2008. This expense would cover KRCD labor costs for engineers to conduct the surveys and GIS mapping. The data collection, analysis of, and summary report for the pool quality/suitability evaluation would be prepared by the TSC at no charge to the program. Design and permitting will be the expenditures of the task of constructing pools for this program year. Site selection and construction will be reserved for future program years.

### **WORK TEAM**

The pool surveying and GIS mapping would be conducted by KRCD engineers. The pool quality/suitability evaluation would be conducted by the TSC with lead responsibility by the KRCD. The KRWA will be the lead agency for the constructed pools.

### **REVIEW AND RECOMMENDATIONS**

The purpose of this project is to study the available velocity refuges for both juvenile and adult trout, and to hopefully provide additional pools in the future. The additional deep water habitat will also create and enhance the number of pools within the channel, and provide escapement to both juvenile and adult trout during high flow periods.

The TSC recommends this element to the ExCom for approval. Additionally, the TSC recommends that the project be permitted for multiple sites, but that as a pilot project, only two such sites should be implemented until scientific evidence can be collected assessing the results of the pilot study.

## **Section V: New Elements (Non-Capital)**

No new non-capital elements are proposed for the program year 2007-2008.

## **Section VI: Ongoing Elements (Capital)**

This 5-Year Plan includes a number of ongoing capital elements that have not been completed, are ongoing from year to year, and have been carried over to this program year. The elements were previously approved by the ExCom and will be implemented in the future. The elements are listed below and their descriptions are presented in Appendix A.

New Element #	Original Element #	Element Title	Total 07-08 Cost
C-2007-1	C-2006-1	Fishery Habitat Master Plan Implementation	\$115,500
C-2007-4	C-2006-4	Public Education	\$ 7,500
C-2007-5	C-2006-5	Monitoring	\$ 73,000
C-2007-6	C-2006-6	Technical Investigation Tour	\$ 500
C-2007-7	C-2006-7	Reservoir Projects	\$ 10,000
C-2007-15*	C-2006-12	Study of Pool Habitat in the Kings River	\$ 10,000
C-2007-15*	C-2006-13	Constructed Deep Water Habitat Pilot Project	\$ 10,000
C-2007-14	C-2006-14	Large Woody Debris Project	\$ 5,000
<b>Subtotal .....</b>			<b>\$231,500</b>

\* - Elements C-2006-12 and C-2006-13 were combined into a single element, C-2007-15 for the 2007-2008 program year and into the future.

## **Section VII: Ongoing Elements (Non-Capital)**

This 5-Year Plan includes a number of ongoing non-capital elements that have not been completed, are ongoing from year to year, and have been carried over to this program year. The elements were previously approved by the ExCom and will be implemented in the future. The elements are listed below and their descriptions are presented in Appendix B.

<u>New Element #</u>	<u>Original Element #</u>	<u>Element Title</u>
N-2007-1	N-2006-1	Development of Exhibit D Flows
N-2007-2	N-2006-2	Continued Development of the 5-Year Plan
N-2007-3	N-2006-3	Investigation into Gift and Grant Opportunities
N-2007-4	N-2006-4	Fish Passage Evaluation
N-2007-9	N-2006-9	Phytoplankton and Nutrient Resource Study

Also, the 5-Year Plan includes a number of elements and tasks that will be performed on a recurring annual basis throughout the period of the program. Ongoing annual elements of the program include:

- Reviewing fishery management goals;
- Implementing hydrologic monitoring requirements, data sources and reporting formats;
- Implementing water temperature monitoring network stations, requirements for real-time (telemetry) and baseline temperature monitoring data, and reservoir temperature monitoring;
- Performing temperature management operations as needed based on real-time conditions and temperature triggering criterion;
- Refining triggering criteria, data input and analysis, and performance evaluation for temperature management;
- Reviewing hatchery stocking plans and contract, if necessary, for future hatchery production to supplement hatchery planting by CDFG;
- Implementing annual sampling and experimental design for baseline fisheries (trout) monitoring including (1) juvenile abundance and distribution; (2) adult abundance and distribution – fall and spring; (3) reproduction, growth, and survival; and (4) overwintering survival, size and age structure of the population;
- Implementing fisheries monitoring within the lower river to assess the abundance and distribution of non-game fish species (e.g., suckers, pikeminnow) and evaluate the feasibility of alternative management actions in accordance with the multi-species reach designations

outlined in the Framework Agreement;

- Reviewing fishing regulations and posting notices;
- Reviewing data from Pine Flat Reservoir fisheries and water quality surveys, and plans for reservoir fishery management;
- Evaluating costs and benefits, as part of the hatchery stocking plan, of planting coldwater species within the reservoir including trout, Kokanee and Chinook salmon to support reservoir recreational fisheries;
- Evaluating potential short-term/low cost fish passage opportunities and implementing them where possible;
- Performing routine annual river stocking of catchable trout from CDFG and, potentially, other hatcheries to support recreational fisheries;
- Performing stocking of trout eggs and/or fingerling or sub-catchable size fish from hatcheries as part of the stock rebuilding program within the river;
- Implementing an annual tagging/marking and monitoring program as part of the routine annual hatchery stocking program within the river;
- Compiling bibliographic and scientific references and technical reports relevant to Kings River fisheries and water quality monitoring, habitat enhancement, experimental design, fishery sampling methods, and experimental investigations. A reference library and computerized annotated bibliography and catalog would be maintained on available reference materials;
- Initiating a program to identify and evaluate opportunities to develop and obtain enhanced instream flows/refinements to the Exhibit D flow schedule;
- Identifying potential supplemental sources of funding for habitat enhancement and other activities as part of this fisheries program.

## **Section VIII: Ongoing Elements (Maintenance)**

Six years of implementation activities under the Kings River Fisheries Management Program have led to development of some facilities that, by their nature, require maintenance, upkeep and repairs. The maintenance elements were previously approved by the ExCom and will be implemented in the future. The elements are listed below and their descriptions are presented in Appendix C.

<u>New Element #</u>	<u>Original Element #</u>	<u>Element Title</u>	<u>2007-2008 Cost</u>
M-2007-1	M-2006-1	Thorburn Channel Maintenance	\$10,000
M-2007-2	M-2006-2	Streamside Incubator Operation and Maintenance	\$2,500
<b>Subtotal .....</b>			<b>\$12,500</b>

## **Section IX: Proposed Plan Elements (2008-2012)**

While the TSC has spent considerable time discussing the staging and selection of elements in the coming years, it does not feel that it is ready, nor would it be appropriate at this time to make specific element recommendations. The TSC will incorporate the comments that it receives from the ExCom and PAG into its development of future program years. However, some important points regarding future year planning are:

- The list of “elements to be considered” that was developed by the TSC will be used as the basis of future element selection.
- Certain elements funded in any give year (e.g. Side Channel Investigations) might dictate how money will be spent in the following year.
- Element success or failure will obviously influence TSC future year recommendations.
- At this point there appears to be consensus that the elements that have potentially high maintenance costs should be considered carefully.
- Other funding opportunities will allow for the acceleration of activities.

# **APPENDIX A**

Description of Ongoing Elements (Capital)

## **ELEMENT C-2007-1**

### **FISHERY HABITAT MASTER PLAN IMPLEMENTATION**

#### **PURPOSE**

Continued implementation of the Fishery Habitat Master Plan to construct fish habitat enhancement projects within an eight-mile reach of the Kings River downstream from Pine Flat Dam will be conducted. The master plan is an informational document for use in permitting the projects with local, state and federal resource and regulatory agencies. Fishery enhancement projects proposed under the master plan are to be implemented during a six-year period beginning in 2004 and extending through 2010.

#### **WORK PLAN**

Planned implementation activities would utilize experience and expertise gained from pilot projects conducted during the winter of 2002. River habitat enhancement techniques proposed in the master plan include:

- Channel ripping and the placement of boulders;
- Addition of spawning gravel;
- Enhancement of an existing small side channel; and
- Planting of riparian trees along riverbanks.

The master plan describes purposes of projects, their proposed sites, habitat enhancement techniques, structural layouts, equipment use and conclusions regarding financial, engineering, and environmental feasibility of each project. As per the plan, the 2007-2008 activities will boulder placement at two sites near the Pine Flat Recreation Area (B-1 and B-2) and some completion work behind Avocado Lake. Stockpiled gravel near Winton Park and Avocado Lake will be placed in the river, and additional gravel may be purchased, stockpiled, and placed at other sites denoted in the Master Plan. Riparian plantings are anticipated near the Pine Flat Recreation Area.

#### **ESTIMATED COSTS**

\$115,500 is proposed for program year 2007-2008.

#### **WORK TEAM**

KRCD will be the lead agency on this task. The TSC in coordination with KRCD staff will implement the projects.

#### **REVIEW AND RECOMMENDATIONS**

The TSC recommends this element to the ExCom for approval.

## **ELEMENT C-2007-4** **PUBLIC EDUCATION**

### **PURPOSE**

As provided in Section G (1) (n) of the Framework Agreement, the Program will continue to engage in public awareness and education activities relative to the Program, and subject to available funding, the parties will explore the engagement on an on-site public information officer.

### **WORK PLAN**

A significant measure of the success of the Fisheries Management Program continues to be active public involvement. The PAG has been actively meeting and engaging the TSC in discussions regarding the program as a whole, and the Five-Year Plan in particular. In order to encourage the PAG's continued involvement and effectiveness, the TSC recommends continued funding of their activities. Some activities that have been identified by the PAG for funding include:

(i) intra-group communication and meeting announcements, (ii) newsletter to public at large, (iii) internet web-site, (iv) manufacture and placement of fishing regulation and educational signs, (v) Kings River Field Day, (vi) River Keeper.

### **ESTIMATED COSTS**

\$7,500 is proposed for program year 2007-2008.

### **WORK TEAM**

The PAG in coordination with the TSC will be responsible for developing and implementing the various components of the Public Education element.

### **REVIEW AND RECOMMENDATION PROCESS**

The TSC recommends this element to the ExCom for approval. The PAG will continue to report to the ExCom on its activities.

## **ELEMENT C-2007-5**

### **MONITORING (Baseline, Project and Special Studies)**

#### **PURPOSE**

Section G (1) (k) of the Framework Agreement “Development of Criteria/Monitoring” calls for the agencies to carry out a monitoring program to determine the effects of various elements of the programs and the overall status of the fishery. This element proposes to continue a comprehensive monitoring program that will in turn provide the agencies and the public with a gauge with which to evaluate the fishery’s status and relative merits of any particular project.

Monitoring plans for each monitoring activity occurs in the 2002-2003, 2003-2004, 2004-2005, 2005-2006, or 2006-2007 5-Year Implementation Plans. Phase II monitoring for the fish tracking study was proposed for 2006-2007, and is continuing in 2007-2008. For this task, the initial plan is included below.

#### **WORK PLAN**

Monitoring activities recommended by the TSC for 2007-2008 are summarized in the table on the following page. It should be noted that several of the recommended monitoring activities will address specific objectives within a relatively short time period (1-2 years) (special studies) such as the recommended study to characterize lower Kings River macroinvertebrates. Results of this monitoring activity would subsequently be used to further evaluate and refine, if needed, future investigations. Other monitoring activities, such as real-time temperature monitoring and adaptive management decisions would be triggered by specific environmental conditions and events and would not be required each year. Monitoring the status and trends of the lower Kings River trout population and assessing the performance of the overall program in improving habitat quality and availability and increasing trout reproduction, growth, survival, and abundance within the lower Kings River would need to be performed consistently over a long period of time (baseline) to assess trends in population abundance.

**Fish Tracking Study Phase I** – This task is a test/feasibility study to evaluate the techniques and equipment for a radio telemetry study of fish movements in the lower Kings River. Funds would be used to train staff on implanting transmitters in fish (surgery), purchase of about 10 transmitters, and reprogramming of KRCD’s tracking receivers. The study would involve the testing of equipment and techniques on the lower Kings River using hatchery or wild trout. If the test/feasibility study is successful and useful, a specific program in addition to Phase II would then be developed. Scientifically important information gathered during a study would include: trout habitat use, use of habitat enhancement projects, movements during the spawning season, movements under stressful warm river conditions, movements under low and high flow conditions, and fish movement barriers. **This element of the project is complete.**

**Fish Tracking Study Phase II** – Assuming the successful completion of Phase I, Phase II would fully implement a Pilot-scale telemetry study to evaluate behavior and dynamics of Rainbow Trout inhabiting the Kings River downstream of Pine Flat Dam. Using either radio or ultrasonic tags, as determined in Phase I, the study would involve the monitoring of either hatchery or wild trout during four time periods, and at two distinct sites of release. Monitoring would begin in May (peak irrigation season), August (late irrigation season), October (early non-irrigation season) and

February (late non-irrigation season), and would involve the release of 80 tagged adult trout and 40 trophy-sized trout throughout the study. The locations of the releases would be half at the Army Corps of Engineers Bridge, and half downstream of the Cobbles Weir. Each trout released as part of this investigation would be tagged with a discrete identifiable radio or ultrasonic tag surgically implanted into the abdominal cavity, and an external \$25 reward tag asking for information from recreational anglers regarding the specific location, length and weight, and date that a tagged fish was harvested. Movement of tagged trout within the Kings River would be monitored using continuous telemetry recording systems located at the Alta and Fresno Weirs, in addition to two mobile tracking devices.

This phase of the program has been in operation throughout the last two low-flow periods, and has covered two Exhibit D flow years. The coming year is expected to be an Exhibit C year, and as such, the TSC is requesting an additional \$12,000 for purchase of tags for monitoring through the low-flow period of 2007-2008. In addition to the funds requested, the additional planting scheduled through the low-flow period of 2007-2008 does represent a divergence from the original study plan, which called for a total of four releases as part of Phase II. However, the TSC feels that for the purposes of comparison, the knowledge gained through this extra release will help for comparison purposes (Exhibit C vs. Exhibit D), as well as provide valuable data in the final analysis of Phase.

This pilot-scale study will help to establish protocols and the experimental design for subsequent fishery monitoring, and provide a scientific and technical foundation for developing an expanded telemetry study for use in quantifying population dynamics, behavior, and movement patterns of various life stages of trout, including subadult, adult, and trophy sized fish, as part of the ongoing fishery management monitoring program.

**Pine Flat Reservoir and Lower Kings River Fish Population Study** – For the 2007-2008 program year, the TSC is recommending that a Bio Statistics study be performed on the data collected for fish populations in Pine Flat Reservoir as well as the Lower Kings River. This technical report could be provided by an outside consultant to ensure that the efforts of the FMP are indeed reflected in the data collected. The TSC is requesting \$5,000 for the purposes of conducting this study.

**Bio Mass Estimate** – For the 2007-2008 program year, the TSC is recommending the inclusion of a Bio Mass Estimate for the lower Kings River. This will be performed by staff from all three agencies (CDFG, KRCD and KRWA), and the TSC is requesting \$1,000 to help defer travel expenses to perform the estimate.

**Calibrated Angler Study** – For the 2007-2008 program year, the TSC would like to perform a Calibrated Angler Study to help evaluate the angling experience on the lower Kings River. The TSC is requesting \$1,000 to help defer costs in performing the study.

**Incubator Effectiveness Study** – For the 2007-2008 program year, the TSC would like to perform a study on the effectiveness of the Egg Incubators currently in operation. The study would involve the purchase of Triploid Trout eggs, which would be placed in the incubators once during the program year. In subsequent years, population studies would be used (electroshocking) to help assess the effectiveness of the incubators. The TSC is requesting \$1,000 to purchase the eggs, as well as sampling materials necessary for completing the study.

**Macroinvertebrate Sampling** – For the 2007-2008 program year, the TSC would like to continue macroinvertebrate sampling as in previous years, with 18 samples taken throughout the program year. The TSC is requesting \$5,400 to cover the costs of processing these samples.

**Water Quality Sampling** – As per the 2004-2005 Water Quality Report, the TSC would like to continue Water Quality Sampling at Fresno Weir through the recommended 12 sample time period. This would require 6 samples in the 2007-2008 program year, at a total cost of \$3,600 for the sampling efforts. The TSC is requesting \$3,600 to cover these costs.

**Dennis Cut Telemetry Installation** – As per the 1999 Framework Agreement, under Section 1 (Program Elements), subparagraph K calls for “the establishment of new flow measurement stations in the Kings River, including measuring stations equipped with continuous water stage recorders suitable for measuring (i) minimum flow in Dennis Cut at a location immediately below the Dennis Cut control structure...” After extensive research, the costs of materials and labor for the installation of a stilling well, as well as all the necessary equipment to transmit continuous data back to the KRWA offices is \$34,500. This installation is to occur during the 2007-2008 program year.

#### **ESTIMATED COST**

\$73,000 is proposed for program year 2007-2008. The PAG has expressed strong support for additional effort to be spent on monitoring in the early stages of the fishery program. Every effort will be made in the coordination of activities to minimize costs to the overall monitoring budget while maintaining the quality of monitoring activities.

#### **WORK TEAM**

The TSC in coordination with agency staff, consultants, and the PAG will implement the monitoring.

#### **REVIEW AND RECOMMENDATIONS**

The TSC recommends this element to the ExCom for approval.

**Element C-2007-5: Proposed Monitoring Summary and Budget**

**(1) Evaluate changes in the status and trends of trout and other aquatic resources e.g., macroinvertebrates on a regional (population) scale.**

<b><u>Proposed Elements (Capital and Maintenance).....</u></b>	<b><u>07-08 Funding Request</u></b>
Pilot Telemetry Study (Phase I).....	Complete
Pilot Telemetry Study (Phase II) .....	\$12,000
Electrofishing Survey (Raft).....	\$2,500
Pine Flat Reservoir and Lower Kings River Fish Population Study .....	\$5,000
Bio Mass Estimate .....	\$1,000
Calibrated Angler Study .....	\$1,000
Incubator Effectiveness Study .....	\$1,000
Macroinvertebrate Sampling.....	\$5,400
Water Quality Sampling .....	\$3,600
Dennis Cut Installation .....	\$34,500
Annual Technical Report .....	\$1,000
Contingency Fund.....	\$1,000

**(2) Evaluate the occurrence and severity of episodic events resulting in a significant reduction in the abundance of trout and other aquatic organisms (e.g., temperature stress)**

<b><u>Proposed Elements (Capital and Maintenance).....</u></b>	<b><u>07-08 Funding Request</u></b>
*Environmental Condition.....	\$0
*Monitoring Analysis and Reporting .....	\$0
Real-Time Monitoring .....	\$5,000
*Temperature Management .....	\$0
*Performance Analyses .....	\$0

**(4) Subtotal:.....\$73,000**

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\* - Represents a monitoring element that is treated as a non-capital expense

## **ELEMENT C-2007-6**

### **TECHNICAL INVESTIGATION TOUR**

#### **PURPOSE**

The agencies and their staffs along with the PAG have been working on the Fishery Management Program now for several years. At the same time, other fishery enhancement and restoration programs are being conducted throughout the state. In order to increase the Programs' collective knowledge and understanding of the options available to it on the Kings River, a technical investigation tour of some of these other programs is proposed.

#### **WORK PLAN**

The TSC will investigate enhancement and restoration projects currently being implemented in California, and assess their suitability to being included in this proposed investigative tour. A group of individuals representing the PAG, TSC, and ExCom would travel to, and meet with representatives of these other programs. (Examples of other programs include: the Tuolumne River, Carmel River and Prairie Creek programs.) The tour participants will meet with the local experts on the project sites when possible. The local experts will provide their insight into how their projects worked (or didn't work) and the resource benefits that were accomplished. In particular, the participants will attempt to gain insight into how each of these programs' performance is monitored and evaluated. The information gathered will add to the expertise that already exists within the agencies and PAG. This program will broaden our base of knowledge and help us to think "outside the box" to accomplish our goal of enhancing the Kings River Fishery.

#### **ESTIMATED COSTS**

\$500 is proposed for program year 2007-2008. The funds would pay for trip expenses including lodging, meals and transportation.

#### **WORK TEAM**

KRWA will be the lead agency for this task. The work team will consist of DFG, KRCD, and KRWA and members of PAG and Ex Com. The TSC will work together to develop the trip itinerary and meal, lodging, and transportation details.

#### **REVIEW AND RECOMMENDATION PROCESS**

The TSC recommends this element to the ExCom for approval. Upon returning from this tour the participants will prepare a report to include descriptions of the projects they visited, comments heard from the local experts, and any insight they might have gained regarding suitable applications to the Kings River program. The TSC will be expected to incorporate these insights into future 5-Year Plan element proposals.

## **ELEMENT C-2007-7** **RESERVOIR PROJECTS**

### **PURPOSE**

The Framework Agreement's "Exhibit A" *Aquatic Resource Enhancement Goals for the Lower Kings River and Pine Flat Reservoir* states that "within the constraints imposed by water operations and without creating a risk of future endangered species conflicts, the program will provide in-reservoir habitat improvement for warm-water fish. The purpose of this element is to allocate money in this program year's budget to accomplish the above referenced goal.

### **WORK PLAN**

Vegetative planting are the primary focus of the reservoir projects proposed in this element. A combination of materials will be seeded at various locations within the fluctuation zone of the reservoir. Material choices include annual grasses and forbes such as wheat and barley, perennial grasses, native grasses, Lupine and Lotus. These materials will be planted in a variety of combinations and individually. Proposed planting sites include areas in the vicinity of Deer Creek, Island Park and Edison Point. Other reservoir projects are directed at increasing the quantity of structural cover available for use by fish. This would be accomplished by installing permanent structural anchors in the fluctuation zone of the reservoir. These structural anchors would be placed perpendicular to the waterline and run up and down the slopes. Brush structures would be cabled to the anchoring system. Location of these systems is to be determined with approval of the U. S. Army Corps of Engineers (Pine Flat Lake).

### **ESTIMATED COSTS**

\$10,000 is proposed for program year 2007-2008. Costs for planting materials are estimated at about \$4,500. Materials for the structural anchors are estimated at \$2,000. Labor for all projects will be provided by the California Conservation Corps (CCC) or contractor at a cost of \$3,500.

### **WORK TEAM**

CDFG will be the lead agency on this task. The CDFG in coordination with the PAG and the TSC will work on coordinating habitat work and improvement projects at Pine Flat Reservoir. Labor associated with this element will be provided by CCC crews or a contractor.

### **REVIEW AND RECOMMENDATION PROCESS**

The TSC recommends this element to the ExCom for approval.

## **ELEMENT C-2007-14**

# **RECONNAISSANCE INVESTIGATION OF LARGE WOODY DEBRIS (LWD) ON THE KINGS RIVER**

### **PURPOSE**

Section 1(f) of the Framework Agreement (funding/projects) discusses habitat improvements to enhance fish and wildlife resources in the lower Kings River.

The occurrence of large woody debris (LWD; greater than 10 cm diameter and 2 m in length) is an important component of the habitat for rainbow trout and other aquatic species. Large woody debris contributes to habitat diversity, provides velocity refuge and overhead cover for fishes, substrate for aquatic macroinvertebrates, and can be an important source of particulate organic matter adding to the primary productivity of a river or stream. Large woody debris also plays an important role in stream morphology, contributing to the formation of pool habitat, localized areas of scour and deposition, and creating localized areas of turbulence and velocity refugia. Large woody debris has been removed from many river systems, including the lower Kings River, by trapping recruitment of LWD from upstream within the watershed by impoundments, and the physical removal of LWD from the lower river in an effort to reduce flow resistance, flood control, and operation and maintenance of instream structures such as weirs, water diversions, and bridge abutments. Efforts over the past decade, particularly in the Pacific Northwest, have focused on strategic methods for engineering and securing LWD that can be placed into a river system to enhance fishery habitat while reducing and avoiding the undesirable risk of damage to structures, including the increased risk of flooding, and other adverse impacts.

### **WORK PLAN**

A large body of information is available in a scientific and restoration literature regarding alternative methods for integrating LWD into aquatic restoration plans. Information is available on the performance of various types of LWD, various anchoring systems used to hold LWD in place, integration of LWD with other habitat enhancement features such as gravel augmentation and boulder placement, densities and placement of LWD within a stream channel, and the biological performance of LWD in enhancing aquatic habitat conditions. Scientific literature also describes past failures experienced when LWD is introduced into a river system, identifies the mechanism for failure, and identifies alternative methods to reduce and avoid adverse impacts. We propose a three-phased approach for investigating the potential feasibility and application of LWD as a component of the Kings River fishery management program. The three phases include:

**Phase I** -- Conduct a literature review summarizing the current state of knowledge regarding integration of LWD into fishery management plans, alternative anchoring systems, engineering considerations, changes in local hydraulics, types of LWD, preliminary cost estimates, evaluation biological performance, and an evaluation of the application of LWD as a component of the fishery management plan for the lower Kings River.

**Phase II** -- In the event that a literature review identifies successful applications of LWD that could be applied to the lower Kings River a pilot- scale investigation would be designed and conducted to test various alternative anchoring systems, document the stability and suitability of LWD within the river, and conduct initial biological performance evaluations to determine whether or not the LWD component of the program should be discontinued, modified, or expanded.

**Phase III** -- Assuming that the pilot-scale study performed in Phase II is successful and no additional engineering or operational constraints are identified, a large-scale master plan element would be developed for integrating LWD into the overall fishery management master plan and habitat enhancement activities on the Kings River.

**ESTIMATED COST**

At this time the TSC is requesting approval for only the Phase I -- literature review portion of the LWD investigation. The estimated cost for data compilation and preparation of the Phase I literature review is \$5,000. The Phase I literature review is anticipated to take approximately six months to complete. Based on results of the Phase I literature review the TSC will develop a recommendation for subsequent phases of the investigation.

**WORK TEAM**

KRWA, KRCD, and CDFG staff

**REVIEW AND RECOMMENDATIONS**

This task was reviewed by the TSC. The TSC will be recommending approval of only the Phase I literature review by the ExCom as part of 2007-2008 fishery program.

## **APPENDIX B**

Description of Ongoing Elements (Non-Capital)

## **ELEMENT N-2007-1** **DEVELOPMENT OF EXHIBIT D FLOWS**

### **PURPOSE**

Section G (1) (e) of the Framework Agreement calls for the KRWA to diligently endeavor to increase the minimum flows set forth in Exhibit C to those levels shown in Exhibit D by October 1, 2005.

### **WORK PLAN**

The KRWA has established an in-house committee that meets monthly to develop and work on ideas that will allow it to provide Exhibit D flows in a manner that avoids unacceptable impacts to its member units. A number of ideas under consideration, including (i) re-operations of irrigation demands and/or the temperature control pool, (ii) groundwater recharge and banking projects, (iii) exchange arrangements with the State Water Project, (iv) surface storage projects, and (v) member contribution by entitlement/storage. As the potential (cost/benefit) of these different concepts is developed, formal engineering studies and analysis will be required. It is anticipated that discussions will take place through the program as to ways that Exhibit D can be modified to provide more benefit to all of the involved parties.

### **ESTIMATED COSTS**

Costs are to be determined as options are developed.

### **WORK TEAM**

KRWA member units and consultants, with review by the TSC and other interested parties.

### **REVIEW AND RECOMMENDATION PROCESS**

Updates will be provided to the ExCom upon request, but not less than once annually.

## **ELEMENT N-2007-2**

### **CONTINUED DEVELOPMENT OF FIVE-YEAR PLAN**

#### **PURPOSE**

Section G (1) of the Framework Agreement includes elements addressing adaptive management (Section 1b); stream temperature monitoring (Section 1d); funding for habitat enhancement projects (Section 1f); enforcement, education, and awareness program (Section 1i); stocking program (Section 1j); development of criteria/monitoring (Section 1k); and access (Section 1p). Development of a Five-Year Plan is needed to provide guidance, prioritize activities and the allocation of expenditures, and coordinate among the parties to facilitate efficient implementation of the elements of the Framework Agreement.

#### **WORK PLAN**

Development of the Five-Year Plan's proposed activities would be based upon a consideration of (1) specific requirements identified within the Framework Agreement; (2) results of previous fisheries and water quality monitoring; and (3) prioritization of habitat restoration activities based upon limiting factors analyses. The Five-Year Plan is to (1) provide a project management structure for reviewing and prioritizing proposed habitat enhancement activities, fish stocking, and other elements of the Framework Agreement; (2) identify the objectives and methods to be used to assess the overall response of trout and other species for use in evaluating achievement of the Kings River aquatic resource goals as identified in Section 1a of the Framework Agreement; and (3) provide a framework for the experimental design and evaluation of specific enhancement activities (*e.g.*, enhancement projects funded under the Framework Agreement, fish stocking and supplementation and pulse flows for temperature management) within the context of the overall goals and activities being implemented through the framework Agreement. Results of monitoring and evaluation activities will serve, in part, as the basis for the adaptive management element of the Framework Agreement (Section 1b) and for identifying changes in program priorities, or the allocation of resources from one program element to another. The Five-Year Plan will continue to be a "living plan" that will be reviewed by the TSC, PAG, and ExCom on an annual basis throughout the 10-year period of the agreement and revised as projects and elements of the program are implemented and as new scientific information becomes available.

#### **ESTIMATED COSTS**

To the extent that existing staff resources are used in the development of the plan, their time will be charged to the appropriate agencies' regular budget and not against the Framework Agreement's annual required contribution. Information from existing feasibility studies, monitoring programs, and technical reports will be used to insure continuity of plan development with previous activities and to obtain maximum efficiency in the development of the Five-Year Plan.

#### **WORK TEAM**

Development of the Five-Year Plan will be the overall responsibility of the TSC, with support from agency staff, the PAG, the ExCom, and consultants as needed.

#### **REVIEW AND RECOMMENDATION PROCESS**

As noted above, the Five-Year Plan is intended to be a "living document". As such, the TSC will continue to revise and present it annually to the ExCom.

**ELEMENT N-2007-3**  
**INVESTIGATIONS INTO GIFT AND GRANT OPPORTUNITIES**

**PURPOSE**

The KRWA is acting as fiscal agent for charitable and memorial contributions until the program utilizes these funds. While this is a convenient arrangement and easily handled, the issue has been raised of the advantage of creating a tax-deductible account (mechanism) to encourage further donations and/or grants.

**WORK PLAN**

Contacts will be made with organizations and individuals with expertise in receiving and administering gifts and grants (tax-deductible or not). Implications of the different mechanisms to the program and its participating agencies will be evaluated. A summary report on the options available and a possible recommendation will be produced for consideration by the ExCom.

**ESTIMATED COSTS**

No budget is being requested from the program to make the above-mentioned contacts and evaluations.

**WORK TEAM**

The KRWA through the TSC will be responsible for coordinating this element. It is anticipated that members of the PAG with experience and contacts in this area will participate extensively.

**REVIEW AND RECOMMENDATION PROCESS**

The TSC recommends implementation of this element with reports and review by the ExCom as appropriate.

## **ELEMENT N-2007-4**

### **FISH PASSAGE EVALUATION**

#### **PURPOSE**

Section G (1) (f) of the Framework Agreement - Funding / Projects discusses fish habitat improvements such as the creation of spawning sites and fish passage facilities to enhance fish and wildlife resources in the lower Kings River. The purpose of fish passage is to allow fish, with emphasis on Rainbow Trout, to move freely throughout the lower Kings River system to:

- Access spawning and rearing areas.
- Access side channel habitat to avoid high irrigation and flood releases.
- Prevent stranding and mortality in side channels.
- Access other river reaches for better food, space, and flow conditions.
- Access colder water in upstream areas when stressful warm water temperatures occur in downstream reaches.

In 1991-1992, the Trihey studies denoted potential fish passage barriers in the lower Kings River. In 1997, KRCD prepared a preliminary assessment of potential fish passage barriers (KRCD 1997, No. 97-006). In February 1999, the CDFG's fish passage expert Mr. George Heise toured potential passage sites with KRCD, CDFG, and KRWA staff and discussed possible options and costs. Later, KRCD prepared reconnaissance fish passage reports for Mill Creek Gauging Weir, Gould Weir, and the Dennis Cut Headgate (KRCD 1999, Nos. 99-003, 99-005, and 99-006).

#### **WORK PLAN**

Previous reports and fish passage literature will be reviewed. The TSC will again tour, assess, and rank fish passage needs at potential barrier sites. The ranking will be used to propose feasibility studies at barrier sites in the future.

#### **ESTIMATED COSTS**

Costs associated with this evaluation are considered to be minor and will be absorbed by the program agencies.

#### **WORK TEAM**

KRCD will be the lead agency on this task. The TSC and its designees will implement this element.

#### **REVIEW AND RECOMMENDATIONS**

The TSC recommends this element to the ExCom for approval.

## **ELEMENT N-2007-9**

### **PHYTOPLANKTON AND NUTRIENT RESOURCE STUDY**

#### **PURPOSE**

At the February 2005 PAG meeting, it was proposed that a phytoplankton and nutrient study be conducted in Pine Flat Reservoir and possibly in the upper and lower Kings River to evaluate current conditions and how they potentially effect the food-chain and food availability to trout in the lower Kings River.

#### **WORK PLAN**

The work team will meet with limnology professors at California State University Fresno (CSUF) and other experts to gain knowledge on possible studies and techniques to evaluate phytoplankton and nutrient resources and opportunities for cooperative projects with CSUF and their students. The work team will conduct a literature search on phytoplankton and nutrient resources as they relate to the Kings River watershed, food-chain effects, effects to trout fisheries, and possibly future studies to evaluate them. The team will develop a list of study options and techniques, and also estimate efforts and costs for a baseline study.

#### **ESTIMATED COSTS**

No budget is being requested from the program to make the above contacts and conduct the search. Costs associated with this evaluation are considered to be minor and will be absorbed by the program agencies.

#### **WORK TEAM**

The TSC will be responsible for coordinating this element. Members of the PAG and possibly CSUF with experience and contacts in this area will be part of the work team.

#### **REVIEW AND RECOMMENDATIONS**

The TSC recommends this element to the ExCom for approval.

## **APPENDIX C**

Description of Ongoing Elements (Maintenance)

## **ELEMENT M-2007-1** **THORBURN CHANNEL MAINTENANCE**

### **PURPOSE**

Section G (1) (f) of the Framework Agreement - Funding/Projects discusses fish habitat improvements to enhance fish and wildlife resources in the lower Kings River. The program's first habitat improvement project, the Thorburn Spawning Gravel Project, was constructed in spring 2000. During its first year in operation, minimal maintenance costs were incurred for repairs or additions to the channel and the surrounding area. To ensure that the channel functions properly, a need exists to maintain the surrounding area. To maintain the surrounding area and to conduct repairs to the channel and/or structures should problems arise, maintenance tasks and appropriate funding are proposed.

### **WORK PLAN**

Monitor channel erosion and stability of structures to ensure the channel functions properly. Maintain the surrounding area by eliminating pest weeds and irrigating planted trees and shrubs. Conduct repairs if and when needed. Channel maintenance in the form of sediment removal will also be performed this year, after the proper permits are obtained.

### **ESTIMATED COSTS**

\$10,000 is proposed for program year 2007-2008. The funds will cover KRCD labor and materials to water and maintain trees and spray weeds. Additional funds (more than in past years) are included for the 2007-2008 program year for channel maintenance that will be required, including sediment removal. The acquisition of permits to perform this work is also necessary, and these additional funds will help with this purpose.

### **WORK TEAM**

KRCD will be the lead agency on this task. TSC in coordination of KRCD staff will implement the maintenance. Work to be subcontracted if needed or desired.

### **REVIEW AND RECOMMENDATIONS**

The TSC recommends this element to the ExCom for approval.

## **ELEMENT M-2007-2**

### **STREAMSIDE INCUBATOR OPERATION AND MAINTENANCE**

#### **PURPOSE**

Section G (1) (f) of the Framework Agreement - Funding/Projects discusses fish habitat improvements to enhance fish and wildlife resources in the lower Kings River. Under Element # C-2002-5, two streamside incubators for hatching trout eggs were constructed in 2003. The incubators can be used two or three times during a year, depending upon the availability of eggs. The incubators will be operated continually for about a one-month period each time eggs are hatched. River water will be pumped and circulated over the eggs at the two permanent stations. Electrical power to run the pumps is purchased from Pacific Gas and Electric Company. To operate and maintain the incubators, appropriate funding is proposed.

#### **WORK PLAN**

Operate the incubators at least two times per year to augment wild trout reproduction in the lower river. Conduct repairs and maintenance to the incubators if and when needed.

#### **ESTIMATED COSTS**

\$1,000 is proposed for program year 2007-2008. The funds will cover electrical charges that will be approximately \$500 per year. Maintenance costs (such as pump replacement or plumbing repairs) are estimated at \$500 per year.

#### **WORK TEAM**

CDFG will be the lead agency for this task. Work to be subcontracted if needed or desired.

#### **REVIEW AND RECOMMENDATIONS**

The TSC recommends this element to the ExCom for approval.

# **APPENDIX D**

## List of Elements Considered

# **KINGS RIVER FISHERIES MANAGEMENT PROGRAM**

## **Five-Year Implementation Plan**

### **List of Elements Considered**

#### **FISH HABITAT**

Spawning Channels  
Pilot Channel with Ripping  
Riparian Planting  
Boulder Projects  
Woody Debris  
Gravel Importation  
Pool Excavation  
Juvenile Structure (Jetties, Coves, Boulders)  
Sedimentation from Mill Creek Watershed  
Warmwater / Native Fisheries Projects  
Advance Planning and Scoping  
Riverwide Permit for Fish Habitat Projects  
Placement of Half Logs in the Thorburn Multi-Use Channel

#### **FISH PASSAGE**

Main Channel  
Side Channels  
Tributaries  
Mill Creek Gauging Weir

#### **TROUT STOCKING**

Eggs  
Fingerlings  
Subcatchables  
Catchables  
Strains of Trout  
Trout Relocation into the Lower Kings River

#### **FISHING ACCESS**

New Access Sites  
Signs  
Easements  
Public Lands Fishing Access Map

#### **FUNDING**

Acquisition of Grants

### **List of Elements Considered (continued)**

### **PROGRAM EVALUATION**

Fish Population Monitoring (River and Reservoir)  
Monitoring and Evaluating of Projects  
Trout Habitat Use  
Aquatic Insect Abundance / Biomass Survey  
Trout Movement - Radio Telemetry Study

### **WATER**

Temperature Control Pool  
Exhibit D Enhanced Flows  
Flow and Temperature Measurements  
Suitable River Temperatures for Fish  
Ramping Rates  
Water Temperature Control Structures (Dam)

### **PINE FLAT RESERVOIR**

Evaluation of Stocking Programs (kokanee, chinook salmon, trout, bass)  
Participation and Input to the Corps Management Plan  
Population Monitoring

### **RIVERBANK HABITAT**

Riparian Plantings  
Buffer Strips  
Fencing  
Land Purchases  
Easement Purchases  
Lower Kings River Habitat Conservation Framework  
Fencing to Protect Juvenile Trout Habitat Structures

### **ENFORCEMENT**

Existing Regulations  
Review of Regulations  
Regulation Posting

### **EDUCATION AND AWARENESS**

Presentations to Sportsmen's Groups, Schools, the Public  
Newsletter - Fisheries News  
River Keeper

## **APPENDIX E**

### Lead Agency Designation for the Elements

# KINGS RIVER FISHERIES MANAGEMENT PROGRAM

## Five-Year Implementation Plan (2007-2008)

### Lead Agency Designation for the Elements

<u>ELEMENT #</u>	<u>DESCRIPTION</u>	<u>LEAD AGENCY</u>
<b><u>New Elements (Capital)</u></b>		
C-2007-15 .....	Study of Pool Habitat and Constructed Pool Project .....	KRCD, KRWA
<b><u>Ongoing Elements (Capital)</u></b>		
C-2007-1 .....	Fishery Habitat Master Plan Implementation .....	KRCD
C-2007-4 .....	Public Education .....	PAG
C-2007-5 .....	Monitoring (Baseline, Project and Systematic) .....	ALL
C-2007-6 .....	Technical Investigation Tour .....	KRWA
C-2007-7 .....	Reservoir Projects .....	CDFG
C-2007-14 .....	Reconnaissance Investigation of Large Woody Debris (LWD) .....	ALL
<b><u>Ongoing Elements (Non-Capital)</u></b>		
N-2007-1 .....	Development of Exhibit D Flows .....	KRWA
N-2007-2 .....	Continued Development of the 5-Year Plan .....	ALL
N-2007-3 .....	Investigation into Gift and Grant Opportunities .....	KRWA
N-2007-4 .....	Fish Passage Evaluation .....	KRCD
N-2007-9 .....	Phytoplankton and Nutrient Resource Study .....	ALL
<b><u>Ongoing Elements (Maintenance)</u></b>		
M-2007-1 .....	Thorburn Channel Maintenance .....	KRCD
M-2007-2 .....	Streamside Incubator Operation and Maintenance .....	CDFG/KRCD
<b><u>Program Administration</u></b>		
A1 .....	ExCom Administration .....	KRWA