

KINGS RIVER FISHERIES MANAGEMENT PROGRAM

Five-Year Implementation Plan

Program Year 2006-2007

DRAFT
Subject to Revision

Submitted to:

Executive Policy Committee

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Preface

This document is the seventh 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 2006-2007 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

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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 2006-2007 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 2005-2006 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 2006-2007. Sections IV, V, VI, VII, and VIII describe the various new and existing capital, non-capital, and maintenance elements proposed for program year 2006-2007. Section IX outlines the TSC's current longer-range thoughts and vision regarding program years 2007-2011. In Appendix E, the lead agency responsible for implementing the specific elements of the 2006-2007 program year is listed.

The TSC is preparing a separate 2005-2006 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 (2005-2006)

The approach used in the 2005-2006 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 2005-2006 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 sixth 5-Year Implementation Plan (for program year 2005-2006) was presented and approved by the Executive Committee at their meeting of February 10, 2005. That 5-Year Plan provided the basic direction for the Technical Steering Committee and program activities through the year.

The ExCom met once during the program year (February 10, 2005) to hear reports from the TSC and the public, and to provide direction to the TSC. The PAG, with Kevin Wren as Chairman, met on a monthly basis to discuss and develop issues important to them. Hank Urbach took over the chairmanship of the PAG in the Spring of 2006. 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-2005-1 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 2005-2006 program year. During the 2005-2006 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 2005-2006 program year, ripping was conducted at eight reaches located among the Avocado Lake, Winton Park, and Pine Flat Recreation Area sites. Additional ripping will take place as necessary in future years at other sites as called for in the plan.

Gravel Placement

Over \$18,000 worth of PG&E gravel was placed at sites G-6 and G-5 during the 2005-2006 program year.

Boulder Acquisition and Placement

In spring and summer 2005, approximately 1,000 boulders were purchased and stockpiled at Avocado Lake County Park for projects. During the fall and winter of 2005-2006, approximately 1,000 boulders from this year’s stockpile, and an additional 500 boulders from previous stockpiling efforts, were placed at sites B-8, B-6 and B-5. During the spring and summer of 2006, boulder stockpiling again took place to replenish supplies at Avocado Lake County Park. Additional placement at these and other sites will take place during the low-flow periods of the 2006-2007 program year.

C-2005-4 Public Education

Public Education efforts continued during the 2005-2006 program year. A Kings River Fisheries News newsletter was published and distributed in spring 2006 with

the assistance of the PAG. Additionally, members of the TSC and PAG were present at the second annual Kings River Day in May of 2005, a highly educational experience for over 600 6th graders in the Reedley area.

- C-2005-5 Monitoring (Baseline, Project, and Special Study)
Due to high flows in the Kings River, electroshocking did not take place during the 2005-2006 program year. The third Annual Technical Report (2004-2005) was drafted in the winter of 2005, and was approved at the April 25, 2006 ExCom meeting. Macroinvertebrate (insect) sampling results were received, analyzed, and discussed with the PAG. 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. A Pilot Scale Telemetry Study began in the 2005-2006 program year, and Phase II is currently ongoing.
- C-2005-7 Reservoir Projects (Pine Flat Reservoir)
Due to budget constraints and reassignment of essential personnel, no activity for this element occurred during the 2005-2006 program year. The projects proposed for the 2005-2006 program year will be reassigned as part of the 2006-2007 5-Year Plan.
- C-2005-8 Public Lands Fishing Access Map
A publication quality map was produced and approved by the ExCom at the April 25, 2006 meeting for distribution. Printing took place, and maps are currently available at multiple locations. This element is considered complete, and will not be included in future 5-year plans.

Elements in Progress (Capital):

- C-2005-6 Technical Investigation Tour
A tour of the Mokulumne River near Lodi, California was conducted in December of 2004. Unfortunately, due to scheduling conflicts, planned tours for the 2005-2006 program year were not undertaken. Future tours of similar river systems are still in the planning stages.
- C-2005-9 Advance Planning and Scoping (Projects)
Implementation of this element did not occur during the program year. This element is considered complete, and will not be included in future 5-year plans.
- C-2005-10 Wild Trout Egg Planting
The TSC discussed the collection of wild trout and the production of hatchery broodstock for future egg planting projects. Pathologists from the CDFG, due to concerns about the spread of disease, prevented the transport and rearing of wild trout into a CDFG hatchery. An alternative method may involve the collection of wild Rainbow Trout and introducing them directly into the lower Kings River in the future. This element is considered complete, and will not be included in future 5-year plans.

Non-Capital Elements:

- N-2005-1 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 (148.7%) water year of 2004-2005 resulted in the triggering of Exhibit D flows for the 2005-2006 water year for the first time in program history. KRWA members provided the enhanced flows throughout the low-flow time periods of the 2005-2006 year.
- N-2005-2 Continued Development of 5-Year Plan
The TSC continues to work on development of the 5-Year Plan that is updated annually.
- N-2005-3 Investigation into Gift and Grant Opportunities
A Fresno County Recreation and Wildlife Commission grant (\$7,600) was used to partially fund the construction of a fishing access parking lot at Fresno County's Green Belt Parkway. Construction of the parking lot was completed in June 2005. The parking lot allows fishermen to safely park and gain access to the lower Kings River in the Fresno Weir reach. Research into other cooperative opportunities is ongoing, and will continue throughout the next program year (2006-2007).
- N-2005-4 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. Past KRCD reports on fish passage at this structure were reviewed.
- N-2005-5 Lower Kings River Habitat Conservation Framework
Upon extensive discussion, this element has been removed for the time being. This element is considered complete, and will not be included in future 5-year plans.
- N-2005-6 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-2005-7 Fencing to Protect Juvenile Trout Habitat Structures
It was determined that no new fencing is needed, and that the gates must stay closed at all times. Coordination efforts are occurring between county agencies and the local

land owners to ensure closure of these gates. KRCD is facilitating these efforts. This element is considered complete, and will not be included in future 5-year plans.

- N-2005-8 Trout Relocation to the Lower Kings River
Upon extensive discussion, this element has been removed for the time being. This element is considered complete, and will not be included in future 5-year plans.

Maintenance Elements:

- M-2005-1 Thorburn Channel Maintenance
Spraying of weeds took place along the roadway and nature trail. The headgate was checked every one to two weeks and accumulated debris was removed. The k-rail was checked for beaver dam-building activities and dams were removed.

- M-2005-2 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 release 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 damaged happened prior to the spring release, but was not discovered until later that fall. The suction line will be replaced when non-demand flows are at 100 cfs. This incubator was not used in spring 2006.

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 115,000 rainbow trout eggs (Coleman strain) on February 24, 2006. Overall egg mortality was approximately 50-60 percent. Increased mortality was likely due to overloading the egg boxes and excessive dead eggs in our allotment. Approximately 80 percent of the fry were released from the incubator volitionally, and the remaining 20 percent were planted in a slack water area on the right bank of Frustration Lake on March 30, 2006.

Section III: Proposed Budget (2006-2007)

Proposed Elements (Capital and Maintenance)

06-07 Funding Request

New Elements (Capital)

C-2006-14Large Woody Debris Project\$5,000

Ongoing Elements (Capital)

C-2006-1Fishery Habitat Master Plan Implementation\$400,000

C-2006-4Public Education\$7,500

C-2006-5Monitoring (Baseline, Project and Systematic)\$42,200

C-2006-6Technical Investigation Tour\$500

C-2006-7Reservoir Projects\$10,000

C-2006-12Study of Pool Habitat in the Lower Kings River\$10,000

C-2006-13Constructed Deep Water Habitat Pilot Project\$10,000

Ongoing Elements (Maintenance)

M-2006-1Thorburn Channel Maintenance\$3,000

M-2006-2Streamside Incubator Operation and Maintenance\$2,500

Kings River Fisheries Management Program (Administration)

A1Administration\$1,000

Subtotal:.....\$491,700

Section IV: New Elements (Capital)

One new capital element is proposed for program year 2006-2007. Below is a description of each element.

ELEMENT C-2006-14

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 2006-2007 fishery program.

Section V: New Elements (Non-Capital)

One new non-capital element is proposed for program year 2006-2007. Below is a description of that element.

ELEMENT N-2006-10

FISH PASSAGE EVALUATION: MILL CREEK GAUGING WEIR

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 watershed to:

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

BACKGROUND

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).

Since inception of the FMP, a fish passage evaluation element has been included in the 5-Year Implementation Plans, but the TSC has not conducted the evaluation due to time constraints. The TSC would focus resources to evaluate one site-Mill Creek Gaging Weir. Benefits to the fishery from passage at Mill Creek Gaging Weir would involve items #1, 2, and 4 noted above, and both trout and native fishes.

WORK PLAN

A two-phase work plan approach will be used to evaluate fish passage at the Mill Creek Gaging Weir.

Phase I - Previous passage reports (as listed above), Heise 1999 tour documents, and fish passage literature will be reviewed. Mill Creek's flow records will be reviewed, summarized, and graphed to determine timing of flows and suitability for trout spawning and rearing. A reconnaissance-level gravel check will be conducted in Mill Creek, upstream of the weir. That information will be summarized in an evaluation memo, and a recommendation will be made regarding the implementation of Phase II.

Phase II – Should Phase I shown favorable conditions for trout in Mill Creek, a feasibility study of passage options and structures would be implemented. This task would involve the use of a professional consultant with expertise in fish passage structures.

ESTIMATED COSTS

The costs associated with Phase I of this evaluation are considered to be minor and will be absorbed by the program agencies. Should the Phase II feasibility study be desirable, the TSC would propose a funding allocation to the ExCom for approval.

WORK TEAM

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

REVIEW AND RECOMMENDATIONS

The TSC recommends this element to the ExCom for approval.

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 06-07 Cost
C-2006-1	C-2005-1	Fishery Habitat Master Plan Implementation	\$400,000
C-2006-4	C-2005-4	Public Education	\$ 7,500
C-2006-5	C-2005-5	Monitoring	\$ 42,200
C-2006-6	C-2005-6	Technical Investigation Tour	\$ 500
C-2006-7	C-2005-7	Reservoir Projects	\$ 10,000
C-2006-12	C-2005-12	Study of Pool Habitat in the Kings River	\$ 10,000
C-2006-13	C-2005-13	Constructed Deep Water Habitat Pilot Project	\$ 10,000
Subtotal			\$480,200

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-2006-1	N-2005-1	Development of Exhibit D Flows
N-2006-2	N-2005-2	Continued Development of the 5-Year Plan
N-2006-3	N-2005-3	Investigation into Gift and Grant Opportunities
N-2006-4	N-2005-4	Fish Passage Evaluation
N-2006-9	N-2005-9	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>2006-2007 Cost</u>
M-2006-1	M-2005-1	Thorburn Channel Maintenance	\$3,000
M-2006-2	M-2005-2	Streamside Incubator Operation and Maintenance	\$2,500
Subtotal			\$5,500

Section IX: Proposed Plan Elements (2006-2010)

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-2006-1

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 2006-2007 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

\$400,000 is proposed for program year 2006-2007.

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-2006-4 **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 2006-2007.

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-2006-5 **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, or 2005-2006 5-Year Implementation Plans. Phase II monitoring for the fish tracking study is proposed for 2006-2007. For this task, the initial plan is included below.

WORK PLAN

Monitoring activities recommended by the TSC for 2005-2006 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.

This element will require an additional \$20,000 for purchase of tags for monitoring through the low-flow period of 2006-2007. In addition to the funds requested, the additional two plantings scheduled through the low-flow period of 2006-2007 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 these two extra releases will help with the Exhibit D Monitoring process, as well as provide valuable data in the final analysis of Phase II due to be completed during this program year.

This pilot-scale study will help to establish protocols and the experimental design for subsequent fisher 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.

ESTIMATED COST

\$42,200 is proposed for program year 2006-2007. 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-2006-5: 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.

<u>Proposed Elements (Capital and Maintenance).....</u>	<u>06-07 Funding Request</u>
Pilot Telemetry Study (Phase I).....	Complete
Pilot Telemetry Study (Phase II)	\$20,000
Electrofishing Survey (Raft).....	\$5,000
*Pine Flat Reservoir.....	\$0
*Fish Populations.....	\$0
*Conceptual Schematic.....	\$0
Macroinvertebrate Sampling.....	\$1,500
Water Quality Sampling	\$8,700
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)

<u>Proposed Elements (Capital and Maintenance).....</u>	<u>06-07 Funding Request</u>
*Environmental Condition.....	\$0
*Monitoring Analysis and Reporting	\$0
Real-Time Monitoring	\$5,000
*Temperature Management	\$0
*Performance Analyses	\$0

(4) Subtotal:.....\$42,200

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

ELEMENT C-2006-5
MONITORING (Baseline, Project and Special Studies)
ADDENDUM – Trout Tracking Study

PURPOSE

While tracking radio tagged fish over the past year, several measures of efficiency have been identified that could free up personnel while maintaining or increasing current location frequency. Personnel could use the additional time to analyze data and carry out other FMP directives. Improving tracking efficiency would involve the upgrading two of the existing receivers, and purchasing two small pontoon boats. An itemized list of requested expenditures is presented in Table 1.

EVALUATION RESULTS

After months of collecting data, it has become clear that improvements are necessary to increase tracking efficiency. Time spent tracking fish could be greatly reduced by upgrading receivers at stationary sites, and using inflatable pontoon boats as our primary tracking vehicles. This equipment has been tested over the last few months, and the results are summarized in Table 2. The analysis was based on actual results where all fish were located once per week.

Upgrade SRX 400 Receivers – The SRX 400 receivers have two major limitations that result in lost data and long delays in the field. These limitations are the data logger memory capacity, and the type of data port used to download text files. During normal operation, memory capacity is regularly overrun resulting in lost data amounting to several days per month. Each day the stationary receivers are downloaded, field personnel are tied down at these sites for several hours. The SRX 400 is downloaded to a lap top computer via a 9-pin serial port. This port creates a bottleneck in the download process that could be remedied by upgrading to a SRX 600 receiver equipped with greater memory capacity, and a USB data port. Download times for the two receivers are summarized in Table 2.

Tracking with Pontoon Boats – Several different tracking methods have been used over the course of this study, including on foot, by air, with pontoon boats, and from a truck. All of these methods are useful, and each one serves a specific purpose. Most of the data is collected on foot with directional antennas. This method worked well until fish began to spread out. It soon became necessary to use other means to travel the river. Floating the river on inflatable pontoon boats is far more efficient than tracking on foot. The CDFG has loaned the FMP two boats for field tests.

ESTIMATED COSTS

The proposed budget augmentation in the amount of \$11,400 for equipment purchases and upgrades could save a significant amount of time in the field that could be applied to other important tasks. Time saved in the field could be redirected toward completing tasks such as maintaining the database and field equipment, or assisting with data analysis. A summary of time/dollar savings is presented in Table 3.

Table 1. Cost breakdown for Trout Tracking Study budget augmentation.

Item	Number Of Units	Unit Cost	Total
SRX 600 receiver upgrade	2	\$4,250	\$8,500
Inflatable pontoon boat	2	\$1,200	\$2,400
Contingency Allowance		\$500.00	\$500.00
Total Request			\$11,400

Table 2. Performance comparison between SRX 400 and SRX 600 receivers*.

Model	Memory Capacity	Data Port	Download Time/MB
SRX 400	1 MB	9-pin serial	1.5 hours
SRX 600	16 MB	USB	10 seconds

*Comparisons were based on tests with equipment routinely used in the field.

Table 3. Summary of time spent on task using current equipment and upgraded equipment, and time/dollar savings resulting from receiver upgrade and boat purchase*.

Task	Weekly Man Hours		Weekly Time Savings (hrs)	Dollar Savings
	Current Equipment	Upgraded Equipment		Weekly
Office Preparation	5.0	1.0	4.0	
Commuting	11.5	3.0	8.5	
Downloads (1 MB)	11.5	.003	11.47	
Tracking	18.5	12	6.5	
Totals	46.5	16.0	30.5	\$337.05
<i>Equipment would pay for itself in 33.8 weeks (8.5 months)</i>				

*Comparisons were based on tests with equipment routinely used in the field.

ELEMENT C-2006-6

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 2006-2007. 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-2006-7 **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 2006-2007. 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-2006-12

STUDY OF POOL HABITAT IN THE LOWER KINGS RIVER

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.

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.

ESTIMATED COSTS

\$10,000 is proposed for program year 2006-2007. 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.

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.

REVIEW AND RECOMMENDATIONS

The TSC recommends this element to the ExCom for approval.

ELEMENT C-2006-13

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. 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

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 COSTS

\$10,000 is proposed in the budget for the program year. Design and permitting will be the expenditures of this task for this program year. Site selection and construction will be reserved for future program years.

WORK TEAM

KRWA will be the lead agency on this task.

REVIEW AND RECOMMENDATIONS

The purpose of this project is to provide velocity refuges for both juvenile and adult trout. 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.

APPENDIX B

Description of Ongoing Elements (Non-Capital)

ELEMENT N-2006-1 **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-2006-2

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-2006-3
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-2006-4

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-2006-9

PHYTOPLANKTON AND NUTRIENT RESOURCE STUDY

PURPOSE

At the February 2005 PAG meeting, they 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-2006-1 **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.

ESTIMATED COSTS

\$3,000 is proposed for program year 2006-2007. The funds will cover KRCD labor and materials to water and maintain trees and spray weeds.

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-2006-2

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 2006-2007. 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

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 (2006-2007)

Lead Agency Designation for the Elements

<u>ELEMENT #</u>	<u>DESCRIPTION</u>	<u>LEAD AGENCY</u>
<u>New Elements (Capital)</u>		
C-2006-14	Reconnaissance Investigation of Large Woody Debris (LWD)	ALL
<u>New Elements (Non-Capital)</u>		
N-2006-10	Fish Passage Evaluation: Mill Creek Gauging Weir	KRCD
<u>Ongoing Elements (Capital)</u>		
C-2006-1	Fishery Habitat Master Plan Implementation	KRCD
C-2006-4	Public Education	PAG
C-2006-5	Monitoring (Baseline, Project and Systematic)	ALL
C-2006-6	Technical Investigation Tour	KRWA
C-2006-7	Reservoir Projects	CDFG
C-2006-12	Constructed Deep Water Habitat Pilot Project	KRWA
C-2006-13	Study of Pool Habitat in the Lower Kings River	KRCD
<u>Ongoing Elements (Non-Capital)</u>		
N-2006-1	Development of Exhibit D Flows	KRWA
N-2006-2	Continued Development of the 5-Year Plan	ALL
N-2006-3	Investigation into Gift and Grant Opportunities	KRWA
N-2006-4	Fish Passage Evaluation	KRCD
N-2006-9	Phytoplankton and Nutrient Resource Study	ALL
<u>Ongoing Elements (Maintenance)</u>		
M-2006-1	Thorburn Channel Maintenance	KRCD
M-2006-2	Streamside Incubator Operation and Maintenance	CDFG/KRCD
<u>Program Administration</u>		
A1	ExCom Administration	KRWA