

KINGS RIVER FISHERIES MANAGEMENT PROGRAM

Ten-Year Implementation Plan

Program Year 2010-2011

DRAFT

Subject to Revision

Submitted to:

Executive Policy Committee

**Jeff Single, CDFG
Steve Haugen, KRWA
Dave Orth, KRCD**

Prepared by:

Technical Steering Committee

March 2010

Preface

This document is the second in a series of “Ten-Year Implementation Plans”, which replace the previously issued “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 a work product of the Technical Steering Committee (TSC).

With the extension of the Framework Agreement on June 26, 2009, funding mechanisms have changed, resulting in a need for more long-term planning in the annual budgetary process for the TSC. This plan contains specific activities and funding proposals for the 2010-2011 program year, along with longer term funding reservations for the next nine program years (through program year 2018-2019), with a significant emphasis upon project implementation through grant funding.

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 Ten-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 Ten-Year Plan represents is positive and progressive.

KINGS RIVER FISHERIES MANAGEMENT PROGRAM

Ten-Year Implementation Plan

Table of Contents

I.	Introduction	2
II.	Summary of Program Year (2009-2010)	5
III.	Proposed Budget (2010-2011 and long-term)	10
IV.	New Elements (Capital)	14
V.	New Elements (Non-Capital)	16
VI.	Ongoing Elements (Capital)	18
VII.	Ongoing Elements (Non-Capital)	19
VIII.	Ongoing Elements (Maintenance)	21
IX.	Proposed Plan Elements (2011-2019)	22

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. On June 26, 2009, the financial commitments of the Framework Agreement were extended another 10 years by all parties involved, with one major funding change. For the next 10 year period, funding provided by CDFG will be in the form of grant funding to complete large capital projects, and the funding provided by KRWA and KRCD will be used to complete smaller projects, maintain monitoring efforts, and be used as local cost-sharing for any of the grant funding provided by CDFG.

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 Ten-Year Implementation Plan (previously Five-Year Implementation Plan) to be prepared and updated each year by the Technical Steering Committee (TSC). The Ten-Year Implementation Plan will be revised each year by the TSC, to reflect 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 Ten-Year Plan.

One of the principle objectives of the Ten-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 Ten-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 Ten-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 Ten-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 10-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 Ten-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 10-Year Plan for 2010-2011 will continue to focus on the enhancement of fish habitat in the lower Kings River, and in wrapping up multiple studies that have been ongoing throughout the past few program years. Specifically, with the proper permitting in place, the program will begin to implement the Pilot Large Woody Debris Project, and part of the riparian habitat enhancement from the Habitat Masterplan. The proposed enhancement projects are designed to supplement various habitat types such as spawning, rearing, hiding, and cover habitat for Rainbow Trout.

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 10-Year Plan, Section II includes a Summary of Program Year 2009-2010 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 2010-2011, and an outline for budgets going forward from 2011-2019. Sections IV, V, VI, VII, and VIII describe the various capital, non-capital, and maintenance elements proposed for program year 2010-2011. Section IX outlines the TSC's current longer-range thoughts and vision regarding program years 2011-2019, and at this point may include conceptual projects not currently enumerated, due to the unknown status of grant funding at the present time. In future Ten-Year Plans, these projects will be spelled out in a more concrete fashion, and will be given element names and numbers at that time. In Appendix E, the lead agency responsible for implementing the specific elements of the 2010-2011 program year is listed.

The TSC is preparing a separate 2009-2010 Annual Technical Report as a companion to the Ten-Year Plan. That document includes results of monitoring studies and evaluation of current habitat enhancement actions and is referenced in a number of 10-Year Plan sections. In addition, a ten year programmatic review document is being prepared including all results from the initial ten year period of the program (1999-2009). These reports serve as part of the scientific foundation for the review and preparation of the current 10-Year Plan.

Section II : Summary of Program Year (2009-2010)

The approach used in the 2009-2010 Ten-Year Plan focused on implementation of the Fishery Habitat Master Plan. In previous years, the Five-Year Plans 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 2009-2010 Ten-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);
- Completing outstanding technical reports on completed studies like the telemetry study;
- Implementation of the Fishery Habitat Master Plan's enhancement actions through riparian planting; and
- Implementation of the Large Woody Debris Pilot Project.

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 first 10-Year Implementation Plan (for program year 2009-2010) was presented and approved by the Executive Committee at their meeting of May X, 2010. That 10-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 (May X, 2010) 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 10-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:

C1 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 guides 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 2009-2010 program year. During the 2009-2010 program year, due to a delay in the permitting process to renew the nationwide permits, no portions of the Fishery Habitat Master Plan were implemented. It is anticipated that the necessary permits will be in hand for the 2010-2011 program year, and that work will continue on the Habitat Master Plan, specifically on the Riparian Planting portion of the Plan.

C4 Public Education

Public Education efforts continued during the 2010-2011 program year. The annual Kings River Day, a highly educational experience for over 600 sixth-graders in the Reedley area, was held successfully in May of 2010. Members of the TSC and PAG participate in this annual event.

C5 Monitoring (Baseline, Project, and Special Study)

The electroshocking efforts for the 2009-2010 program year followed the more comprehensive 3-pass method as approved by the ExCom in the 2007-2008 program year. In total, six days of electroshocking took place in November of 2009. During the electroshocking efforts, the first stage in the incubator effectiveness study was initiated, with each trout captured having blood drawn and analyzed microscopically to attempt to determine the level of contribution from the incubators. The seventh Annual Technical Report (2008-2009) was drafted in the fall of 2009, and was approved by the PAG and the ExCom at the May 2010 meeting. The Pilot Scale Telemetry Study that began in the 2005-2006 program year and continued through the 2007-2008 program year, is currently being analyzed and a series of white papers are forthcoming from the TSC on the results.

- C6 Technical Investigation Tour
Unfortunately tours for the 2008-2009 program year were not undertaken. Future tours of similar river systems are still in the planning stages, with one anticipated for the 2010-2011 year at the Merced River.
- C7 Reservoir Projects (Pine Flat Reservoir)
In the winter of 2008-2009, 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 2009-2010 program year.
- C14 Large Woody Debris Project
Permits were applied for during the 2007-2008 program year, and it was deemed necessary to complete a Cultural Survey. This survey was completed during the 2008-2009 program year, and the TSC is currently awaiting the final permits to continue forward with the project. Initial monitoring in the form of electrofishing was performed for this element in November of 2007. With much of the preliminary work complete, the TSC plans on receiving the final permits in short order, and plans to implement this project in the 2010-2011 program year.
- C15 Study of Pool Habitat and Constructed Deep Water Habitat Pilot Project
Because of budget considerations, this project remains in the planning stages, and initial feasibility studies are planned for the 2010-2011 program year.
- C16 Purchase of Rainbow Trout Eggs for Incubators
Two batches of Rainbow Trout Eggs were purchased during the 2009-2010 program year. One full batch (150,000 eggs) was planted in the Incubators during November of 2009, with both incubators used. One full batch (150,000 eggs) of triploid Trout eggs were planted in the Incubators during February of 2010 in support of the Incubator Effectiveness Study portion of element C5, with both incubators used. Visually, these eggs once again had an extremely high estimated success rate. With the estimated success rates observed, it is anticipated that in years which CDFG cannot provide enough eggs to fill the incubators, the TSC will again consider the purchase of Rainbow Trout Eggs to keep the Incubator program on track.

Non-Capital Elements:

- N1 Development of Exhibit D Flows
Tentative internal Exhibit D agreements have been developed by KRWA member units to provide the flows. The third dry (79%) water year in a row of 2008-2009 did not trigger Exhibit D flows for the 2009-2010 program year. The agreements are in place for future Exhibit D triggering years, and the KRWA is committed to fulfilling the obligations of the Framework Agreement now, and into the future.
- N2 Continued Development of 10-Year Plan
The TSC continues to work on development of the 10-Year Plan that is updated annually.
- N3 Investigation into Gift and Grant Opportunities
Research into cooperative opportunities is ongoing, and will continue throughout the next program year (2010-2011).
- N4 Fish Passage Evaluation
This is an element that the TSC plans to research and address in the future.
- N9 Phytoplankton and Nutrient Resource Study
Given the results of the Length-Weight Analysis, Water Quality Analysis, and Macroinvertebrate Studies, the TSC has concluded that the available food supply on the Kings is not a limiting factor. Also, with the limited resources available, the TSC does not feel this study is a priority, and as such will be removed from consideration for at least the foreseeable future.

Maintenance Elements:

- M1 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. The k-rail was checked for beaver dam-building activities and dams were removed.
- M2 Streamside Incubator Operation and Maintenance
The incubators were stocked and used twice during the 2009-2010 program year. The lower incubator did have to be flushed before stocking commenced.

Section III: Proposed Budget (2010-2011)

With the extension of the Framework Agreement on June 26, 2009, funding mechanisms have changed, resulting in a need for more long-term planning in the annual budgetary process for the TSC. Under the previous 10 year term of the Framework Agreement, funding was provided with \$50,000 annually each from the Kings River Conservation District and the Kings River Water Association (resulting in a \$1,000,000 total contribution for the two agencies), and up to \$100,000 annually from the California Department of Fish and Game (resulting in approximately \$700,000 total contribution for CDFG).

Going forward into the next 10 years (2009-2019), both the Kings River Conservation District and the Kings River Water Association agreed to continue to provide \$50,000 each annually to the program. However, because of the issues with the state budget, the California Department of Fish and Game is no longer able to provide a line-item \$100,000 annually, and will diligently pursue grant funding for large capital projects, providing up to \$1,300,000 for the next 10 years to end up with a total contribution of \$2,000,000 over 20 years. In addition, because grants often require a local cost-share component, this means that some of the funds provided annually to the program will need to be reserved for cost-share purposes on large capital projects.

Thus, the budgetary process has evolved into a planning scenario that has a much longer time horizon than in previous program years. It is anticipated that in terms of annual expenditures for the program, the process will remain the same, with the TSC preparing an annual budget that the Executive Policy Committee must approve for that program year. However, to facilitate the grant proposal process that CDFG staff will be involved in, the budgets will now also include a component reflecting future projected expenditures as much as the TSC can anticipate.

The end result is a budgetary document that begins with a balance carried over from the previous 10-year period, adds in the expected \$1,000,000 contribution from the Kings River agencies, and projects expending \$1,300,000 of grant funds from CDFG efforts on large capital projects, either on the books currently, or with future capital improvements. At the present time, future capital improvements are not enumerated with an element number, but they will be assigned one in future 10-Year Plan documents as they are identified.

2010-2019 Budget Table

COPY= Carry Over from Previous Year , *CF = Future Capital Projects, CO=Carry Over

	09-10 Budget	09-10 Actual	10-11	11-12	12-13	13-14	14-15	15-16	16-17	17-18	18-19	Total
<i>Income</i>												
KRCD	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$500,000
KRWA	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$50,000	\$500,000
CDFG	\$0	\$92,000	\$0	\$400,000	\$0	\$0	\$600,000	\$0	\$0	\$300,000	\$0	\$1,392,000
COPY	\$148,722	\$148,722	\$211,969	\$197,469	\$260,469	\$23,469	\$85,969	\$168,969	\$31,969	\$6,969	\$372,469	\$148,722
Total	\$248,722	\$340,722	\$311,969	\$697,469	\$360,469	\$123,469	\$785,969	\$268,969	\$131,969	\$406,969	\$472,469	\$2,540,722
<i>Costs</i>												
C1	\$10,000	\$8,000	\$7,000	\$400,000	\$200,000	\$0	\$200,000	\$200,000	\$0	\$0	\$200,000	\$1,215,000
C4	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$25,000
C5	\$10,000	\$44,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$134,000
C6	\$0	\$0	\$500	\$0	\$0	\$500	\$0	\$0	\$500	\$0	\$0	\$1,500
C7	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$100,000
C14	\$50,000	\$0	\$50,000	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$0	\$0	\$0	\$62,500
C15	\$0	\$0	\$0	\$0	\$0	\$0	\$80,000	\$0	\$0	\$0	\$0	\$80,000
C16	\$6,000	\$8,253	\$8,500	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$6,000	\$64,753
*CF	\$0	\$50,000	\$20,000	\$0	\$100,000	\$0	\$300,000	\$0	\$90,000	\$0	\$237,969	\$797,969
M1	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$25,000
M2	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$2,500	\$25,000
A1	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$10,000
Total	\$94,500	\$128,753	\$114,500	\$437,000	\$337,000	\$37,500	\$617,000	\$237,000	\$125,000	\$34,500	\$472,469	\$2,540,722
<i>CO</i>	<i>\$154,222</i>	<i>\$211,969</i>	<i>\$197,469</i>	<i>\$260,469</i>	<i>\$23,469</i>	<i>\$85,969</i>	<i>\$168,969</i>	<i>\$31,969</i>	<i>\$6,969</i>	<i>\$372,469</i>	<i>\$0</i>	<i>\$0</i>

The previous table shows the anticipated breakdown of funds going forward into the next 9 program years. The original budget for 2009-2010 is listed in the first column of the table. The actual budget spent is in the 2nd column. The biggest differences between the two were due to unexpected funds being available from CDFG in the amount of \$92,000, and the fact that permitting was delayed longer than expected on both the Large Woody Debris Pilot Project (Element C14) and the Riparian Planting portion of the Habitat Master Plan (Element C1). These elements will be carried over into the 2010-2011 budget year.

The funding that was unexpectedly available was largely spent on monitoring equipment (\$34,000) and on the new incubator expansion (Element C17 - \$50,000). An additional \$8,000 of this funding was used to purchase trees to be planted in the upcoming program year for the Riparian Planting Project of the Habitat Master Plan (Element C1). Future funding for large projects, identified on the table in the previous page as Future Capital Projects (CF) will come from grant funds, which CDFG is committed to providing to the program. During the 2010-2011 program year, the TSC is requesting \$20,000 to assist in developing large-scale projects to bring forward in future program years. This request is outlined in Element C18. For the purposes of the table on the previous page, both C17 and C18 are included on the Future Capital Projects (CF) funding line.

Section IV: New Elements (Capital)

Two new capital elements are proposed for the program year 2010-2011. They are as follows:

ELEMENT C17 **INCUBATOR EXPANSION**

PURPOSE

Section G (1) of the Framework Agreement includes an element addressing adaptive management (Section 1b) and the stocking program (Section 1j). As provided for 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. This element proposes an expansion of the incubator program to include a new site that would be larger in scope, and available for educational tours to the public as well, serving a dual purpose.

WORK PLAN

The Kings River Fisheries Management Program currently has 2 successfully operating Rainbow Trout Egg Incubators along the river. The TSC was made aware of an opportunity during the 2009-2010 program year to expand the incubator program. A county building located near the Handicapped Access downstream of the Army Corps Bridge that is sufficient in size to develop and operate an incubator program was located, and funds were made available through CDFG to potentially develop this site further. The work plan was developed in 2009-2010 and includes:

- Develop property agreement with County of Fresno (believed to be complete in May of 2010);
- Purchase necessary equipment for operating incubator, including pumps, raceways, and all necessary plumbing (Currently in the process of being purchased using CDFG funds);
- Install necessary electrical connections to building to keep incubator operational (Currently working with PG&E on this);
- Work with the PAG on developing an educational tour program; and
- Investigate potential costs of procuring eggs for hatching and rearing.

ESTIMATED COSTS

\$50,000 is proposed for program year 2010-2011, though the funds may already have been spent in 2009-2010 due to available CDFG funds.

WORK TEAM

The TSC will be responsible for the construction of the facility and will coordinate with the PAG on operation of the facility and developing and implementing the educational tour program.

REVIEW AND RECOMMENDATION PROCESS

The TSC recommends this element to the ExCom for approval.

ELEMENT C18

LARGE SCALE PROJECT DEVELOPMENT

PURPOSE

Section 1(f) of the Framework Agreement (funding/projects) discusses habitat improvements to enhance fish and wildlife resources in the lower Kings River. Throughout the Habitat Masterplan and the Large Woody Debris Pilot Project, the TSC has focused efforts on habitat improvements to enhance the fishery. As funding models have now changed, the TSC must focus on large-scale projects that can result in successful grant funding, with matching local funds, going forward. The TSC would like to spend some time investigating what has been successful on other similar river systems in their enhancement efforts, and as such would like to speak directly with multiple private consultants who have worked on these large-scale projects to develop like projects on the Lower Kings River.

WORK PLAN

In previous discussions with consultants, the TSC was made aware of successful large-scale implementation of projects that enhanced rivers locally. During the next year the TSC would like to work with these consultants to develop:

- A minimum of 3 large-scale projects/elements that can be implemented within the next 10 years;
- Methods to apply for and receive grant funding to leverage funds available locally to complete these large-scale projects;
- Work with consultants to develop the ideal locations for implementation of these projects on the Lower Kings; and
- Ensure that the current permitting allows for these projects to proceed OR begin the process to obtain the necessary permits to do so.

ESTIMATED COSTS

\$20,000 is proposed for program year 2010-2011.

WORK TEAM

The TSC will be responsible for the completion of this element during 2010-2011.

REVIEW AND RECOMMENDATION PROCESS

The TSC recommends this element to the ExCom for approval.

Section V: New Elements (Non-Capital)

One new non-capital element is proposed for the program year 2010-2011, and is as follows:

ELEMENT N10

UPPER KINGS RIVER WATER CONDITIONS STUDY

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. 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.

The Public Advisory Group (PAG) fully recognizes and applauds the effort the Fisheries Management Program (FMP) has put forth in the past ten years of the program in habitat enhancement projects in the lower Kings River that have helped to enhance the trout fishery. The PAG also recognizes the monitoring work already performed by the FMP, and is cognizant of the numerous studies already performed by the FMP, including the Length-Weight Analysis, Water Quality Analysis and Macroinvertebrate Reports, indicating the presence of healthy fish, good water quality and an assemblage of bugs present that would qualify as average (for west-side Sierra streams downstream of an impoundment) for a food source in the lower Kings.

However, in spite of many significant accomplishments of the FMP during its first decade, the restoration of trout populations to believed historic levels has continued to be elusive, and the bug populations do not appear to be as healthy as in the past either. This is in contrast to the river conditions above Pine Flat Reservoir, where members of the PAG have indicated that both trout and bug populations are consistent with their level historically.

As habitat improvements are ongoing, questions remain in regards to potential differences in water conditions in the upper Kings River versus that of the lower Kings River, and if these differences have lead to better retention of trout and bug populations in the upper Kings as opposed to the lower Kings. As such, the PAG would like to determine if there is anything that can be replicated in the lower Kings River to mimic the water conditions situation in the upper Kings River and potentially enhance the fishery in this manner to complement the ongoing and planned habitat enhancements.

WORK PLAN

The PAG would like for the work team to develop a plan to build on the previously released Water Quality Reports, and analyze basic Water Quality data (hardness, temperature, and toxicity) at multiple locations in the upper Kings River and at the ACOE Bridge for the lower Kings River to see if there are any discernable differences spatially and temporally. If differences are found, the work team is to develop alternative management strategies to try and better replicate water conditions downstream of Pine Flat Dam to match those seen in the upper Kings River.

ESTIMATED COSTS

There are no costs for the upcoming program year proposed, as the TSC still has to evaluate the scientific merit of the proposal. Temperature sensors are currently in place at four locations upstream of Pine Flat Dam, and this data will be analyzed by the TSC and reported back to the PAG during the 2010-2011 year. If it is determined that further analysis will be performed including the Water Quality parameters (hardness and toxicity), costs will be dependent upon the sites selected for analysis, and the cost per sample for processing. It is anticipated, given the current work load of the TSC, that this element will not become a capital element until at the earliest the 2011-2012 program year.

WORK TEAM

The TSC will be responsible for coordinating this element.

REVIEW AND RECOMMENDATIONS

The TSC recommends this element to the ExCom for approval.

Section VI: Ongoing Elements (Capital)

This previous 5-Year Plans included a number of ongoing capital elements that were not completed, continued ongoing from year to year, and have been carried over to the new 10-Year Plan. The elements were previously approved by the ExCom and will continue to be implemented in the future. The elements are listed below and their descriptions are presented in Appendix A.

Element #	Element Title	Total 2010-2011 Cost
C1	Fishery Habitat Master Plan Implementation	\$ 7,000
C4	Public Education	\$ 2,500
C5	Monitoring	\$ 10,000
C7	Reservoir Projects	\$ 10,000
C14	Large Woody Debris Project	\$ 50,000
C15	Purchase of Rainbow Trout Eggs for Incubators	\$ 8,500

Section VII: Ongoing Elements (Non-Capital)

This previous 5-Year Plans included a number of ongoing non-capital elements that were not completed, continued ongoing from year to year, and have been carried over to the new 10-Year Plan. The elements were previously approved by the ExCom and will continue to be implemented in the future. The elements are listed below and their descriptions are presented in Appendix B.

<u>Element #</u>	<u>Element Title</u>
N1	Development of Exhibit D Flows
N2	Continued Development of the 5-Year Plan
N3	Investigation into Gift and Grant Opportunities
N4	Fish Passage Evaluation

Also, the 10-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)

Ten 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>Element #</u>	<u>Element Title</u>	<u>2010-2011 Cost</u>
M1	Thorburn Channel Maintenance	\$2,500
M2	Streamside Incubator Operation and Maintenance	\$2,500
Subtotal		\$5,000

Section IX: Proposed Plan Elements (2011-2019)

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. These elements for the time being are identified in the Budget Table as CF for Future Capital Projects. 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 given 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 C1

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 were expected to be fully implemented during a six-year period beginning in 2004 and extending through 2010. Permits are currently being obtained to extend the master plan beyond 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. For the 2010-2011 program year, riparian planting will take place along the riverbanks near Pine Flat Recreation Area, assuming all permits are obtained in a timely manner. Meanwhile, additional funds will be set aside for the purpose of continuing the work laid out in the Habitat Master Plan in future program years.

ESTIMATED COSTS

\$10,000 is proposed for program year 2010-2011 for the riparian plantings.

Future implementation of additional portions of the Habitat Master Plan is contingent upon availability of grant funding provided by CDFG.

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 C4 **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

\$2,500 is proposed for program year 2010-2011.

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 C5

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, 2006-2007, or 2007-2008 5-Year Implementation Plans. Phase II monitoring for the fish tracking study was proposed for 2006-2007, continued through the 2007-2008, 2008-2009 and 2009-2010 program years, and should wrap up in 2010-2011. For this task, the initial plan is included below.

WORK PLAN

Monitoring activities recommended by the TSC for 2010-2011 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 three low-flow periods, and has covered two Exhibit D flow years, and one Exhibit C year. The coming year is expected to be a year in which the TSC works diligently to complete analysis of the data collected. As such, no funds are requested for the 2010-2011 program year for the Rainbow Trout Telemetry Program.

Pine Flat Reservoir and Lower Kings River Fish Population Study – For the 2010-2011 program year, the TSC is recommending that funds be set aside for a Bio Statistics study to be performed in a future program year on the data collected for fish populations in Pine Flat Reservoir as well as the Lower Kings River, after completion of the Telemetry Study. 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 does not anticipate conducting this study during the 2010-2011 program year.

Bio Mass Estimate – For the 2010-2011 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 2010-2011 program year, the TSC would like to continue 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 differ costs in performing the study.

Incubator Effectiveness Study – For the 2010-2011 program year, the TSC would like to continue a study on the effectiveness of the Egg Incubators currently in operation. The study involves the purchase of Triploid Trout eggs, which were placed in the incubators once during the 2008-2009 program year, and again during the 2009-2010 program year. During the coming year, TSC members will attempt to assess the effectiveness of the incubators during the electrofishing event in the Fall. The TSC is requesting \$1,000 for training costs, as well as sampling materials necessary for completing the study.

Macroinvertebrate Sampling – The TSC's Macroinvertebrate Report indicated that annual monitoring was not cost effective for the program. As such, real-time funding is available for sampling in the case an episodic event occurs that may affect the Macroinvertebrate populations in the river.

ESTIMATED COST

\$10,000 is proposed for program year 2010-2011 to be implemented in this program year.

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 C5: 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.

Proposed Elements (Capital and Maintenance)..... **10-11 Funding Request**

For 2010-2011 Implementation

Bio Mass Estimate	\$1,000
Calibrated Angler Study	\$1,000
Incubator Effectiveness Study	\$1,000
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)

Proposed Elements (Capital and Maintenance)..... **10-11 Funding Request**

*Environmental Condition.....	\$0
*Monitoring Analysis and Reporting	\$0
Real-Time Monitoring	\$5,000
*Temperature Management	\$0
*Performance Analyses	\$0

(4) Subtotal:.....\$10,000

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

ELEMENT C6

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

It is anticipated the TSC will take a tour in the Merced River during the 2010-2011 program year for investigative purposes and \$750 is requested for this activity.

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 C7

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 is 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, perennial grasses, native grasses, Lupine and Lotus, and grains such as wheat and barley. 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 2010-2011. 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 C14

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 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. **This element of the project is complete.**

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 continuing to Phase II of the study. The estimated cost for Phase II is \$50,000. Depending on the progress of permitting (still ongoing as of the publication of this document), this Phase could begin as early as the late fall of 2010.

WORK TEAM

KRWA, KRCD, and CDFG staff

REVIEW AND RECOMMENDATIONS

This task was reviewed by the TSC. The TSC will be recommending approval Phase II as part of 2010-2011 fishery program, assuming permitting is obtained in a timely fashion.

ELEMENT C15

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

The TSC does not anticipate funding necessary for this program year.

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.

ELEMENT C16

PURCHASE OF RAINBOW TROUT EGGS FOR INCUBATORS

PURPOSE

Section G (1) of the Framework Agreement includes an element addressing adaptive management (Section 1b) and the stocking program (Section 1j). Due to difficulties in acquiring rainbow trout eggs for the purposes of hatching them in the streamside incubators, the TSC would like to supplement available eggs from CDFG with purchased eggs from third party suppliers when necessary.

WORK PLAN

A significant measure of the success of the Fisheries Management Program continues to be active public involvement. The PAG has been actively involved in the streamside incubator operation and maintenance, and have encouraged the TSC to continue hatching eggs as part of the overall program. For the 2010-2011 program year, and potentially beyond this, the TSC would like to purchase Rainbow Trout Eggs from a third party provider to supplement, and potentially replace the source of eggs provided by CDFG in years where egg supplies from CDFG are simply unavailable.

ESTIMATED COSTS

\$8,500 is proposed for program year 2010-2011.

WORK TEAM

All three agencies will be involved on this task. The TSC in coordination with staff from all three agencies, and the PAG will implement the project.

REVIEW AND RECOMMENDATIONS

The TSC recommends this element to the ExCom for approval.

APPENDIX B

Description of Ongoing Elements (Non-Capital)

ELEMENT N1 **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 N2

CONTINUED DEVELOPMENT OF TEN-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 Ten-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 Ten-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 Ten-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 Ten-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 Ten-Year Plan.

WORK TEAM

Development of the Ten-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 Ten-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 N3

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 N4

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.

APPENDIX C

Description of Ongoing Elements (Maintenance)

ELEMENT M1 **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

\$2,500 is proposed for program year 2010-2011. 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 M2

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

\$2,500 is proposed for program year 2010-2011. The funds will cover electrical charges and any maintenance costs (such as pump replacement or plumbing repairs) that may arise throughout the year.

WORK TEAM

KRCD will be the lead agency, along with the assistance from the PAG for the maintenance and operations portions for this task. CDFG will be the lead agency for covering any electrical charges incurred.

REVIEW AND RECOMMENDATIONS

The TSC recommends this element to the ExCom for approval.

APPENDIX D

List of Elements Considered

KINGS RIVER FISHERIES MANAGEMENT PROGRAM

Ten-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
Phytoplankton and Nutrient Resource 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

Ten-Year Implementation Plan (2009-2010)

Lead Agency Designation for the Elements

<u>ELEMENT #</u>	<u>DESCRIPTION</u>	<u>LEAD AGENCY</u>
<u>New Elements (Capital)</u>		
<u>Ongoing Elements (Capital)</u>		
C1	Fishery Habitat Master Plan Implementation	KRCD
C4	Public Education	PAG
C5	Monitoring (Baseline, Project and Systematic)	ALL
C6	Technical Investigation Tour	KRWA
C7	Reservoir Projects	CDFG
C14	Reconnaissance Investigation of Large Woody Debris (LWD)	ALL
C15	Study of Pool Habitat and Constructed Pool Project	KRCD, KRWA
C16	Purchase of Rainbow Trout Eggs for Incubators	ALL
C17	Incubator Expansion	ALL
C18	Large Scale Project Development.....	ALL
<u>Ongoing Elements (Non-Capital)</u>		
N1	Development of Exhibit D Flows	KRWA
N2	Continued Development of the 5-Year Plan.....	ALL
N3	Investigation into Gift and Grant Opportunities	KRWA
N4	Fish Passage Evaluation.....	KRCD
N10	Upper Kings River Water Conditions Study	ALL
<u>Ongoing Elements (Maintenance)</u>		
M1	Thorburn Channel Maintenance	KRCD
M2	Streamside Incubator Operation and Maintenance	CDFG/KRCD
<u>Program Administration</u>		
A1	ExCom Administration	KRWA