Trinity Management Council Subcommittee

Trinity River Restoration Program Evaluation Final Report

March 29, 2004

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Trinity Management Council
Subcommittee Membership List

1. Curtis Anderson (TMC- DWR), Subcommittee Chairman
2. Serge Birk (TAMWG – Central Valley Project Water Association)
3. William Brock (TMC -USFS)
4. Robert Franklin (TMC - HVT)
5. Dave Hillemeier (TMC -Yurok Tribe)
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13. Harry Rectenwald (TMC - CDFG)
14. Russell Smith (TMC - USBR)
15. Tom Stokely (TMC - Trinity County)
16. Tom Weseloh (TAMWG - CALTROUT)

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EXECUTIVE SUMMARY

The signing of the Trinity River Mainstem Fishery Restoration Record of Decision (ROD) in December 2000 initiated a new effort to restore the anadromous fishery resources of the Trinity River. The new Trinity River Restoration Program (Program) is guided by the restoration vision of the Trinity River Flow Evaluation Final Report (Flow Evaluation Report), and the Program was restructured to apply Adaptive Environmental Assessment and Management (AEAM) in meeting Flow Evaluation Report goals. The Implementation Plan of the Trinity River Restoration Program (Appendix C of the Final EIS/EIR) describes the structure and process of the new Program organization. Since the signing of the ROD, many of the Program groups have formed and the Adaptive Environmental Assessment and Management staff (AEAM staff) have been hired, yet some significant aspects of Program implementation and function have yet to be realized. Therefore, the Trinity Management Council (TMC) formed a Subcommittee at the October 29, 2003 meeting in Weaverville, California to evaluate progress of the Program. The TMC directed the Subcommittee to:

1. Evaluate the intention of the ROD and Implementation Plan versus what the Program has accomplished over the past two years.
2. Evaluate what is working well with the Program and what is not.
3. Determine how to get where we want to be.

The TMC also requested that, to the highest degree possible, the evaluation avoid personnel issues, be forward looking, and focus on recommendations to better achieve the goals of the Flow Evaluation Report and ROD. A broad cross section of Subcommittee members, including TMC designates, representatives from the Trinity Adaptive Management Working Group (TAMWG), and Flow Evaluation Report authors, was selected to provide a rigorous and objective Program evaluation. Authors of the Flow Evaluation Report, ROD, and Implementation Plan also contributed input to the Subcommittee. Over a five month period, the Subcommittee reviewed background documents (Flow Evaluation Report, ROD, and Implementation Plan) and consulted with authors of these background documents to document the original intent of the Program structure and function. Additionally, discussions with Program participants provided valuable information on how the Program was being implemented, and hurdles that were impeding implementation progress.

Findings

The Subcommittee found that the Program has been achieving some goals listed in the Implementation Plan, and should be applauded for these important accomplishments. Parts of the Program, however, have not met expectations of the Implementation Plan. The primary finding of the Subcommittee is that many key aspects of the Implementation Plan have not been implemented as intended, and many others are significantly behind schedule. Some of the shortcomings are due to unanticipated challenges (e.g., litigation of the ROD, larger contracting and permitting time than expected). However, there are a variety of internal issues impeding progress to implement the ROD. These issues can be grouped into three categories: Vision, Management, and Implementation.

Vision

The Subcommittee found that the Program participants have an incomplete understanding of the intent of the Flow Evaluation Report, ROD, and Implementation Plan. This is not simply limited to the AEAM staff, but extends to the TMC and TAMWG as well. As these groups were formed and the AEAM staff was hired, there was an inadequate transfer of vision from the authors of the Flow Evaluation Report and Implementation Plan to the AEAM staff and other Program participants. This inadequate transfer of vision has resulted in inefficient implementation due to competing visions and unclear priorities. This lack of a shared and consistent vision has delayed the implementation timeline.

Management

The Implementation Plan intended for the Program to be directed by a multi-agency group of managers with decision-making authority to guide the Program as would a board of directors. This vision is not occurring. There is a strong perception that this remains a Program run by the Bureau of Reclamation (USBR) rather than a multi-agency board of directors, and that the TMC is not adequately engaged in the details of the Program.

Program objectives and timelines in the Implementation Plan have slipped, and hurdles to achieving Program objectives and timelines have not been challenged by the AEAM staff. The TMC has not used the Implementation Plan as the yardstick to measure Program progress and success, and interact with AEAM staff to identify solutions to meeting the timeline in the Implementation Plan.

Within the AEAM staff, management at several levels within the Program struggles to develop Program priorities and timelines, which impairs implementation priorities and timelines. Structured project management does not appear to be occurring on a significant level within the Program, which is impairing the achievement of implementation goals in a timely manner.

Implementation

Ultimately, the success of the Program is measured by a restored fishery, which depends on implementing the ROD. While some implementation has occurred or is imminent (e.g., initial coarse sediment augmentation and bridge replacement), most components of the Program are one to three years behind the schedule intended in the Implementation Plan.

Delays are occurring in the scientific component of the Program, as well as the AEAM organization and restoration implementation components. Adaptive management and the science to support it has yet to be implemented by the Program because: 1) several key components of the AEAM have not been fully implemented e.g., Science Advisory Board (SAB), 2) staff have been overly burdened with contracting duties, and (3) staff hiring has not fully met the quantitative modeling qualifications as outlined in the Implementation Plan.

The Implementation Plan was vague in describing how TAMWG and TMC technical representatives would participate in the scientific portions of the Program. While improvements in the monitoring and research budget prioritization have been made in the

past year, the Program funding process is still largely driven by loosely guided proposals rather than science-directed request for proposals (RFPs) based on ROD implementation needs. Studies and monitoring are still being conducted that do not have a clear connection to management needs to implement the ROD, which is preventing resources from being applied to gather information needed to better implement the ROD.

The Program has probably made the most progress in restoration implementation, with the initial coarse sediment introduction project in summer 2003, and the impending bridge replacements in late 2004. However, progress on bank rehabilitation designs, additional coarse sediment augmentation projects, structure relocation, and watershed rehabilitation remain far behind schedule. Many of the delays in implementation result from an unanticipated level of effort needed for environmental compliance, but insufficient staff numbers and project management has also slowed implementation efforts. The Subcommittee is concerned that if the legal constraints on the ROD flow regime will be resolved soon, the Program will be unable to implement the ROD flow regime because implementation constraints remain (bridges, structures, bank rehabilitation projects, coarse sediment supply).

Recommendations

The Subcommittee recommends changes in three key areas. First, Program participants need to have a common vision based on the restoration strategy in the Flow Evaluation Report and AEAM process in the Implementation Plan. Second, the science foundation of the Program needs to be made more rigorous and fully implemented. Third, Program participants need to improve management to achieve mandated restoration objectives. More specific recommendations include:

- All Program participants must understand the scientific underpinnings of the ROD, and the Program management organization and function outlined in the Implementation Plan. Therefore, a consistent vision needs to be established among existing AEAM staff and Program participants. We recommend a series of presentations to the TMC, TAMWG, AEAM team and SAB by Dr. Clair Stalnaker and other authors of the Flow Evaluation Report and Implementation Plan. This common scientific understanding and vision development should occur as new AEAM staff are hired.

- The TMC must become more engaged and direct the Program, including working with AEAM staff and other Program participants to prioritize Program components, identify bottlenecks for implementing the ROD, and develop solutions to remove these bottlenecks. To maximize TMC member time effectiveness, the Subcommittee recommends having monthly TMC conference calls with the Executive Director in addition to the regularly scheduled meetings. These conference calls would enable better TMC oversight of: 1) Program progress based on the Implementation Plan and Strategic Plan schedule, and 2) Program challenges and ways the TMC can assist in meeting these challenges.

- The TMC and AEAM staff needs to make a priority of fully implementing the science-based adaptively managed Program as outlined in the ROD. Improving the science portion of the Program will require filling vacancies to restaff the Technical Modeling Analysis Group (TMAG) with scientists whose qualifications are aligned with the intent of the Implementation Plan. Additionally, adjustment of certain staff positions to better align with the intent of the Implementation Plan will improve Program performance.

- With oversight from the TMC, the AEAM staff needs to develop timelines for channel restoration goals in line with the Implementation Plan schedules, and to manage AEAM staff, Program resources, and cooperator resources to achieve those goals. The TMC also needs to prioritize and guide the Strategic Plan, focusing the Strategic Plan on the objectives, timelines, and milestones established by the ROD and Implementation Plan

- The TMAG must develop funding priority recommendations for monitoring and research based on information needed to best implement the ROD. Restaffing TMAG vacancies aligned with the scientific qualifications described in the Implementation Plan, establishing a common vision for the TMAG, and implementing the intended function of the SAB and Expert Review Panels (ERPS) will assist the TMAG in achieving this function.

- Improving implementation progress will require several additional full-time staff positions in the Rehabilitation Implementation Group (RIG) over the next 2 to 5 years. Second, the TMC needs to be educated on the environmental compliance hurdles facing the Program, and assist in developing solutions to these hurdles to speed up implementation. Third, improvements are needed in project management procedures in the RIG.

The AEAM staff has already begun addressing some of these recommendations, but ultimately it will require a significant additional combined effort by all Program participants to achieve the intent of the Implementation Plan tasks, process, and timeline. Implementing the recommendations of this report will help the Program better achieve mandated restoration objectives, will achieve them in a more cost-effective and time-efficient manner, and will lead to greater stakeholder buy in and public support that will ensure the long-term success of the Trinity River Restoration Program.

INTRODUCTION

The Secretary of the Interior formed the Trinity Management Council (TMC) in the Trinity River Mainstem Fishery Restoration Record of Decision (ROD) signed December 19, 2000. The ROD directs the TMC to implement the Preferred Alternative of the FEIS/EIR. The ROD specifies in section V. Components of the Decision:

> *"For the reasons expressed in this ROD, the Department's agencies are directed, through the Trinity Management Council, to implement the Preferred Alternative as described in the FEIS/EIR and to implement the reasonable and prudent measures described in the NMFS and Service Biological Opinions. The Preferred Alternative incorporates the recommendations developed in the Flow Evaluation Study and evaluated under the Flow Evaluation Alternative, coupled with the additional watershed protection efforts identified in the Mechanical Restoration Alternative. Although the Secretary retains ultimate authority over this program, by this Record of Decision, the Trinity Management Council is established which will guide overall implementation of the management actions of the Implementation Plan."*
>
> *"Reclamation and the Service, as the Secretary's representatives on the Trinity Management Council, will be responsible for assuring that the restoration is carried out in a timely manner and that progress reports are submitted to the Department and to the Congress."*

Recently, some TMC members have had concerns that the schedule for implementing the ROD (Appendix A) had slipped from the expected schedule outlined in the Implementation Plan (Appendix B). The Implementation Plan describes in detail the various parts of the Trinity River Restoration Program (Program) including timelines of major milestones. On October 29, 2003, the TMC formed a Subcommittee to evaluate the progress of the Program in implementing the ROD. It had been three years since the ROD was signed and the Program officially formed. Given that the TRRP has been under the direction of the TMC and Executive Director for roughly two years, the TMC felt that a review of TRRP progress was timely. The Subcommittee was given three charges.

1. Evaluate the intention of the ROD versus what has been accomplished in the past two years.
2. Evaluate what is working well with the TRRP and what is not.
3. Determine how to get to where we want to be.

At the December 9, 2003 TMC meeting, the TMC further recommended that the Subcommittee include participation of the TAMWG, and talk to staff and Program participants to get feedback. The TMC provided some additional guidelines to the Subcommittee at that meeting:

1. "What does success look like? Where are we trying to get to? The ROD and its implementation plan are the primary source. Discussions with others may inform our understanding; but, the written documents must be the 'North Star' by which we navigate. They capture the agreement by the Hoopa Valley Tribe & Interior that satisfies requirements of Federal Legislation."
2. "Where are we today? And how does that compare to where we want to be?"
3. "What is our best understanding of the Limiting Factors impeding our movement from where we're at to where we want to be? At this point, I'm not interested in knowing all hurdles. I'm interested in knowing the smaller set of challenges that must be overcome to move us closer to our goal."
4. "Knowing the limiting factors, 'What's Important Now?' Give us several specific recommended actions we can implement this year that will move us forward."

The TMC also requested that, to the highest degree possible, the evaluation avoid personnel issues, be forward looking, and focus on recommendations to better achieve the goals of the Flow Evaluation Report and ROD.

The Subcommittee is very aware of the fine line between being direct in addressing the significant improvements needed to successfully implement the Program and being too direct and offending participants in the Program. The Subcommittee attempted to walk this fine line by using the Flow Evaluation Report, the Implementation Plan, and the ROD as a guide.

All interested individuals and agencies need to recognize and appreciate the unique standing held by the Program among other federally managed restoration programs. The Subcommittee reminds readers that the Program is special and can be a nationally recognized model for restoration and AEAM implementation. Most other restoration programs do not have the clear restoration plan and mandate as that for the Trinity River, and have not implemented rigorous, science-based adaptive management. The goal of the Subcommittee in this review is to help the TMC and the Program identify deviations from the Implementation Plan and develop short and long-term recommendations to better implement the ROD as intended in the Implementation Plan.

SUBCOMMITTEE DATA GATHERING PROCESS

The first meeting of the Subcommittee was held November 13, 2003 in Arcata. This first meeting provided: (1) background on the purpose, rational, and function of the ROD and Implementation Plan by its authors, and (2) an update on current Program implementation activities by Doug Schleusner, Ed Solbos, and Daryl Peterson.

Dr. Clair Stalnaker presented a broad perspective on the intent of the AEAM Program, focusing on the Program organization and function (see Appendix C for PowerPoint presentation), and led the group through a discussion of the AEAM portion of the Implementation Plan. The AEAM framework for the Trinity River was developed by Clair Stalnaker and Rod Wittler, with assistance from other Flow Evaluation Report Team participants. While developing the AEAM framework, Clair, Rod, and Scott McBain reviewed other AEAM Program structures, and traveled to Flagstaff, AZ to discuss the Glen Canyon AEAM Program with staff from the Glen Canyon Monitoring and Research Center. Based on this research and their collective experience, they developed a science-based restoration Program for the Trinity River based on adaptive management principles. There was a group discussion led by Clair, Rod, Scott, and Joe Polos about various rationales for the Program organization as described in the Implementation Plan.

Following this initial meeting, the Subcommittee met numerous times throughout a five-month period. Table 1 provides a summary of the meeting dates, purpose of each meeting, and the primary results from each meeting. Additionally, the Subcommittee utilized Clair and Rod as resources because of their involvement in developing the Flow Evaluation Report and Implementation Plan

Table 1. Summary of TMC Subcommittee meetings.

Meeting Date	Purpose of Meeting	Results of Meeting
11/13/03	Organize the TMC Subcommittee. Gain insight of AEAM process through presentation by Dr. Clair Stalnaker and other Flow Evaluation Report authors. Gather information on actual implementation activities. Determine a list of implementation issues to concentrate on.	Documented actual implementation activities. Documented some barriers to implementation. Developed an initial list of areas where actual Program implementation differed from that described in the implementation plan.
12/1/03	Discussion of preliminary results of Subcommittee with Mike Ryan, Mary Ellen Mueller, and Doug Schleusner.	A decision was made to present preliminary results at the December 12th TMC meeting.
12/12/03	Present preliminary results to the TMC.	The TMC provided direction for the Subcommittee to continue work. The TAMWG would participate with the TMC Subcommittee.
1/7/04	Develop a plan to discuss implementation activities with all parts of the Trinity River Restoration Program. Provide input to TMC on immediate TMAG need for fisheries biologist that would be consistent with longer-term Subcommittee recommendations.	The Subcommittee determined a format for discussions with the AEAM Team. The Subcommittee would solicit input from the TAMWG through email. Submitted a letter to TMC providing input on the fisheries biologist position in the TMAG.
1/16/04-1/17/04	Discussions with AEAM Team and the TMC Subcommittee.	The AEAM Team provided significant information on the current status of implementing the ROD, and provided numerous recommendations to better achieve implementation objectives.
1/26/04 (email)	Sent email questionnaire to all TMC members to provide additional input on Program issues and recommended improvements. Sent email questionnaire to all TAMWG members to provide additional input on Program issues and recommended improvements.	Received a response from one (1) of the TMC members. Received a response from two (2) of the TAMWG members.
2/17/04	Develop final list of findings and recommendations. Develop a schedule for completing the final report. Assign individual writing tasks.	Develop primary findings and recommendations, develop report completion schedule, and assign individual writing tasks.
3/18/04-3/19/04	Incorporate comments received on draft report into final report.	Assignment of individual writing tasks.

SUMMARY OF AEAM STAFF INTERVIEWS

On January 15, 2004, the TMC Subcommittee had two days of discussions with the AEAM staff. The meeting started with a presentation of the intent of the Flow Evaluation Report and Implementation Plan, intent of the AEAM Program, and scientific needs of the AEAM Program by Dr. Clair Stalnaker. A group discussion of Dr. Stalnaker's presentation followed, and then two primary questions were posed to the AEAM staff by the Subcommittee: (1) What are your staff duties with respect to the intent of the Implementation Plan, and (2) What are the primary limiting factors inhibiting the Program from achieving its goals, and (3) What actions are necessary to get the Program back on the schedule envisioned by the Implementation Plan? These questions align with the charge given to the Subcommittee by the TMC (see Introduction section). Two days were spent on these questions, both as group discussions (e.g., TMAG and RIG), and with just the Executive Director. There were many consistent themes developed from these interviews, and these themes are summarized below as "Issues" and "Recommendations". While many of the individual Subcommittee members have had considerable exposure to AEAM team challenges, the interviews provided critical first-hand confirmation of our experiences, and many new issues and recommendations were developed during our meeting with AEAM staff. Consistent issues and recommendations from AEAM staff are listed below in bullets for brevity, and are not attributed to specific staff members in this document out of respect for individuals. Many of these issues are carried forward into the Findings and Recommendations section of this report.

Issues discussed by AEAM staff

Organization

- Internal project management and internal coordination needs improvement. Management is often done by crisis management rather than by longer-term project management ("reactive" versus "proactive"). Staff activities are very divided, making it difficult for them to focus on any single task for an effective amount of time.
- Work-space conditions are poor for being productive. Existing office and cubicles provides no quiet working space, no doors, no library. Phone system is inadequate, cannot conduct conference calls.
- Internal communication, coordination, and follow-up needs to be improved (includes staff-to-staff, branch-to-branch, and management-to-staff). Few internal staff meetings, and those held are not very productive. Some staff have been directed to conduct tasks without being educated on why they are doing the task.
- Outreach outside the Program is insufficient.
- Low staff morale, several technical staff leaving Program. Several staff do not feel as though they are working as a team.
- Perception that staff numbers are fixed and that additional staff could not be added. Grade levels inadequate to accomplish intent of Implementation Plan (particularly with TMAG), and management has trouble justifying needed grade levels with Sacramento.
- Lack of fish biologist is really impairing their progress.

- Need more TMC guidance on Program priorities, as well as more management by the TMC as a group.
- TMAG and RIG considered by some to function as separate groups rather than an integrated team.
- Very little orientation occurred as staff were hired.

Science

- Not aware that Flow Evaluation Report hydrographs could be adjusted.
- Inconsistent vision and understanding of the science and purpose of the Program.
- Science framework process has lagged behind schedule, and is an important component because science must justify and support implementation actions.
- Program is still doing mostly monitoring, not assessment as intended in the Implementation Plan.
- Contracting burdens are much greater than anticipated.
- USBR contracting process is difficult.
- Need multi-year contracts to reduce contracting burden.
- TMAG staff did not expect to be doing any significant contracting tasks (which now occupies 50% or more of their time).
- Has been difficult to get data and information from cooperators, potential issues of data ownership.
- Staff advertisement qualifications from original recruiting process were much different (lower) than what was described in the Implementation Plan. USBR continues to down-Grade staff position advertisements.
- Monitoring and studies are still heavily influenced by needs not attributable to specific ROD implementation needs. Still collecting data for the sake of collecting data, rather than by a prioritized information-needs basis. Some needs-based projects are starting, but much more needs to be done.
- Still no peer review process for proposals or reports.

Implementation

- Implementation Plan timeline has not been a driving factor to date. Incremental progress has been acceptable. 10-12 years needed (under current operating assumptions) to implement the first 24 channel rehabilitation projects (instead of the 3 years specified in the Implementation Plan).
- Environmental compliance is significant hurdle, and is limiting implementation progress. Permitting agency representatives treat the Program actions no differently than as a subdivision development.
- Workload is much greater than anticipated.
- Environmental compliance agency representatives don't have Program-wide perspective, hampers permitting process. Some agencies are hedging on moving forward based on the uncertainty of getting the ROD flows.
- No State lead for CEQA.
- Need GIS and information management support.
- A process structure is needed to clearly define lead roles between RIG and TMAG on restoration projects.

- Inadequate project management, contingency planning, and landowner outreach is limiting implementation progress.
- Litigation is limiting implementation progress.
- Has been difficult to get data and information from cooperators, has caused some delays in environmental compliance.
- Differing views of Program "success".
- Differences in level of design detail at Hocker Flat has prolonged the design process and increased costs.

Recommendations from AEAM staff

Organization

- Need an outreach coordinator, perhaps half-time.
- Need better internal office planning, management, and coordination.
- AEAM staff need to go through Program tasks to decide and justify what should be conducted internally versus what should be outsourced to other agencies, tribes, and consultants.
- Need better work space and library. Perhaps move into space next door and add walls.
- Contracting needs to clearly state that the Program owns the data.
- A streamlined contracting process is needed. Multi-year contracts will help, but simplified contracting is needed to respond to short-term opportunities.
- More TMC guidance on Program priorities.
- Consider conference calls with the TMC to better engage them in Program direction and overcoming implementation hurdles.
- Evaluate potential divisions and coordination issues between the TMAG and RIG. They should be functioning in an integrated fashion, but this is not always the case. Some suggest eliminating TMAG/RIG branch structure because it reduces coordination.
- TMC needs to clarify wildlife and ecosystem restoration goals and priorities.
- Need GIS/information management staff in the TMAG.
- Need integrated modeler staff in the TMAG.
- Need a fish biologist immediately in the TMAG.
- New staff should have more complete orientation, with time (2-3 weeks) available to review background documents and spend time in the field. A more structured orientation process is needed.
- TMC may need to elevate certain issues (e.g., position grading) to the Secretary of the Interior if needed.

Science

- Need to restaff TMAG as soon as possible, and consider increasing beyond the 5 staff positions.
- Consider scaling back fiscal year 2004 projects to focus on scientific framework process.
- Need GIS technician-level staff person.

- Need integrative modeler and information management staff person (TMAG is losing their staff person for this position).
- Need to focus monitoring and study resources towards those information needs to implement the ROD (Science Framework Process will help this).
- Need to fully implement RFP-based process that is directed by the science needs identified by the TMAG based on the Flow Evaluation Report and the Scientific Framework Process.
- Implement peer review process to help improve proposals and reports.
- Consider details and Intergovernmental Personnel Act options for adding short-term staff (up to 2 years).

Implementation

- Need additional environmental compliance staff person.
- Need additional senior engineer.
- Need a consistent vision on the level of detail for restoration designs.
- Need greater TMC participation in resolving environmental compliance and other issues (e.g., FEMA mapping).
- Need to have the TMC help brainstorm a long-term environmental compliance strategy, which may include a programmatic approach.
- Need to educate regulatory agencies on bigger picture restoration needs and importance to speed up environmental compliance on restoration projects.
- Need a State lead for CEQA.
- Need much more internal project management. Often there is too much crisis management, and not enough contingency planning.
- Need to consider whether to pursue conservation easements as part of the restoration projects on private property.
- Need long-term gravel sources for the coarse sediment augmentation program.
- Need TMC to help resolve whether government agencies can compete with academia and consultants in response to RFPS.

FINDINGS AND RECOMMENDATIONS

The Subcommittee recognizes that there are significant hurdles faced by the Program when trying to implement the ROD. The Implementation Plan touches on many issues briefly, however many of these issues have taken a significantly greater amount of time and resources to implement. In other instances, some of the functions of some of the AEAM groups and staff are unclear or poorly defined. Through this review, the Subcommittee identified many of these hurdles to implementation and developed recommendations to realign the Program with the intent of the ROD and Implementation Plan.

The Subcommittee found that the issues impeding implementation of the ROD and Implementation Plan fell into three general categories: Vision, Implementation, and Management. These findings and recommendations to address them are summarized below. The accompanying tables provide more detailed descriptions of the various components of the Implementation Plan, the current status of these components, and recommendations and timelines (Tables 2-13). Recommended timelines are based on information contained in the Implementation Plan or on the importance of various components in fulfilling the needs of the Program. It is expected that the TMC and AEAM staff will evaluate these recommendations and adjust as appropriate.

#1 – Vision

Background

A clear, consistent vision for the restoration of the anadromous fishery resources of the Trinity River, as described in the Flow Evaluation Report, Implementation Plan, and ROD, is the foundation of the Program. All members of the separate organizations of the Program must first understand the basic premises and hypotheses for achieving fishery resource restoration, and second, strongly support the science based approach to implementation and assessment of the restoration actions.

Findings

1. There is an incomplete understanding of the goals and objectives of the restoration Program as outlined in the ROD and Implementation Plan across all portions of the Program (TMC, TAMWG, AEAM staff). Most members of the Program do not have a complete understanding or vision of the goals, objectives, and restoration actions outlined in the Flow Evaluation Report, ROD, and Implementation Plan.

2. There is evidence that some Program participants do not understand or support the flow schedule flexibility within the five water year (WY) volumes, despite the clear direction for that in the ROD.

3. There was no orientation of new Program members by the authors of the Flow Evaluation Report, ROD, and Implementation Plan to obtain an accurate and common understanding of the documents.

4. Written and verbal feedback received by the Subcommittee indicates that the TMC, TAMWG, and AEAM staff would benefit from a combined meeting to discuss specific roles and responsibilities.

Recommendations

1. Conduct joint and individual programmatic workshop(s) with the TMC, TAMWG, SAB, and AEAM staff as soon as possible. The focus of such a workshop(s) is to summarize the Flow Evaluation Report, ROD, and Implementation Plan, followed by open discussion. The workshop(s) should pay particular attention to the overall strategy, restoration objectives, and initial actions established in the Flow Evaluation Report, as well as organizational and individual roles and responsibilities for executing the ROD and Implementation Plan. The outcome of the workshop(s) should be a programmatic understanding of the restoration Program strategy and objectives developed in the Flow Evaluation Report.

2. Establish lines of communication between the authors of the Flow Evaluation Report, ROD, and Implementation Plan to maintain a consistent and comprehensive understanding of the written documents to Program participants.

 # 2 – Implementation

Background

The Program is a unique science-based management program, designed around the AEAM concept. AEAM is not a separate activity of the Program, rather it is an integral scientific process that guides, informs, evaluates and advances restoration and management actions. The purpose of the organization is to design and evaluate annual operations plans (management actions). The design process must be updated at least annually, based on the status of the fishery resources, as well as inter- and intra-annual variability of the current physical and hydrological conditions in the river and basin.

The Flow Evaluation Report, ROD, and Implementation Plan describe the initial suite of annual management actions (water year flow schedules, channel rehabilitation, coarse sediment management, watershed restoration, and AEAM). Management actions for flow releases are flexible based on the water supply that designates the total water volume available for a given water year. The Flow Evaluation Report details the basic premises and supporting science behind the initial objectives, as well as, the uncertainties and assumptions for implementation.

The implementation portion of the restoration Program can be divided into two broad, but integrated categories: science and restoration activities. The foundation of the AEAM Program is a credible, science-based monitoring and assessment Program. In addition to the scientific component of the Program, restoration must occur to reverse instream habitat degradation and watershed degradation that has impaired salmonid populations.

The TMAG is the science component of the Program and is responsible for developing and implementing the assessment and management program to guide restoration efforts. TMAG guides all scientific aspects of the Program and develops restoration, flow, monitoring, and funding recommendations for the TMC.

Findings-Science

1. The AEAM function of the Program has yet to be fully implemented. For example, the design process for assessing annual management actions and the annual flow release schedule is substantially unimplemented. A comprehensive and integrated objective-specific monitoring program is necessary to assess management actions (flow, gravel augmentation, restoration). Until this is implemented, the success or failure of management actions will be difficult, if not impossible, to assess.

2. It was intended that the TMAG would develop the scientific framework to guide monitoring and restoration activities, using information contained in the Flow Evaluation Report as a starting point. Limited time, management priorities, and staff qualification have prevented the TMAG from fulfilling the intended leadership role for this function.

3. TMAG staff has not created the modeling paradigm, designed appropriate annual assessments, and developed RFPs to adequately conduct the annual assessments. Consequently there is virtually no analysis and prediction process to form the basis for creating quantitative, measurable assessment objectives. Although some modeling is contracted with outside organizations, internal modeling capability and direction has fallen short of the intent of the Implementation Plan.

4. Establishment of the SAB is just beginning and ERPS are not established. These two entities are essential for providing peer review and financially disinterested input into the monitoring and restoration activities. As a result, proposals, reports and study plans are not being improved as intended in the Implementation Plan.

5. Few of the studies and analyses that established the science foundation of the Flow Evaluation Report have been updated or extrapolated to describe the Trinity River from Lewiston Dam down to the North Fork confluence. A baseline description the area for future comparison and documentation of changes in the channel form, habitat quantity, quality, etc has not been completed. Since the Implementation Plan is based on the premise that the channel will significantly change, there must be a good description of the current status for future comparison.

6. The RFP and proposal review process for financial assistance agreements has not been fully implemented. Most projects focus almost exclusively on monitoring, as under the former Trinity River Task Force, rather than assessment. Few of the financial assistance agreements are being designed for objective specific assessment of management action outcomes. The lack of an objective specific RFP process has perpetuated the funding of some projects that have questionable linkages to instream and watershed restoration or management efforts.

7. The present TMAG staff spends a large majority of their time preparing financial assistance agreements. The RIG staff is concentrating on floodplain modifications (bridges and infrastructure moves). The original intent was for the AEAM team to be comprised of a core group (TMAG) in charge of analysis of potential management actions, simulations, assessment design and annual update of the fishery resources and channel habitat status that would closely collaborate with another core group (RIG) responsible for implementation of on-the-ground restoration activities and contracting functions.

Recommendations-Science

1. Develop the integrated science-based modeling and assessment program that is necessary to support the AEAM program. The Program needs the capability to conduct predictive modeling and integration of multi-disciplinary assessments into comprehensive management recommendations.

2. Fully staff the TMAG with persons qualified to conduct the modeling and assessment activities, guide restoration actions, and develop the contemporary science framework process. The TMAG needs to provide Program direction based on the best available science.

3. Develop the science framework, including current status of the river (baseline) and comprehensive monitoring and assessment plans.

4. Integrate the SAB and ERPs into the science framework process.

5. Develop an RFP process for assessment of management action outcomes by tying the data to specific models and interdisciplinary analyses. Redesign the RFP process to solicit proposals that supports the Program's information needs based on the results of the science framework.

Findings-Restoration Activities

1. Implementation activities associated with the construction of the four bridges have required substantially more staff time than originally envisioned. This is primarily due to the substantial permitting and contracting efforts, and delays in identifying a CEQA lead. Bridge relocation, while behind schedule, should be completed by December 2004 and should not impair the ability to release high flows in 2005.

2. Structure relocations needed to enable high flow releases have been initiated with a contract to Trinity County to address the yellow house, Poker Bar bridge approach, and the Salt Flat well. Other efforts addressing structure relocations have yet to be initiated.

3. Channel rehabilitation activities are substantially behind the schedule outlined in the ROD and Implementation Plan. Partial designs for two channel rehabilitation sites have been completed. Construction on the first project is not planned until summer 2005.

4. Staff indicated that it would take 10-12 years to complete the initial 24 channel rehabilitation sites if there were no changes to the Program.

5. There is reluctance by some regulatory agencies and Program participants to proceed with channel rehabilitation until the ongoing litigation is resolved.

6. Coarse sediment augmentation has been initiated and a draft coarse sediment management plan developed. Developing and implementing a large-scale coarse sediment augmentation is behind schedule.

7. An evaluation of fine sediment remediation on Grass Valley Creek has been completed.

8. A contract with the U. S. Geological Survey has been established to evaluate cost effective means of fine sediment reduction for watershed rehabilitation activities.

Recommendations-Restoration Activities

1. Ensure completion of bridge construction and structure relocations by early spring 2005 to allow for higher flows if the litigation constraint is removed and wetter water year occurs in 2005.

2. Develop a work-plan and resource needs to complete the initial 24 channel rehabilitation sites within the next 3 years.

3. Hire another engineer and another environmental compliance specialist for the RIG to assist with structure relocations and channel rehabilitation projects.

4. Reevaluate the Mainstem Restoration Subcommittee's priority list for the first 25 restoration sites and develop a science-based implementation strategy to prioritize and guide channel rehabilitation planning efforts.

5. TMC needs to make a determination on the effects, if any, the litigation has on channel rehabilitation and other non-flow activities. The court order allows implementation of all aspects of the ROD except the flow component. All alternatives in the Supplemental EIS except for the No Action and Revised Mechanical will have sufficient flow magnitudes to achieve most of the fluvial-geomorphic objectives to maintain the channel rehabilitation sites, so the Subcommittee believes that planning, design, and environmental compliance for channel rehabilitation activities should be completed prior to the litigation being resolved.

6. Continue initial coarse sediment augmentation in the Lewiston reach as prescribed in the Flow Evaluation Report and develop a large-scale coarse sediment augmentation program (sources, introduction locations, design, and environmental compliance).

7. Complete a watershed rehabilitation strategic plan in cooperation with land owners and managers that targets remediation of fine sediment sources in a time and cost efficient means.

 # 3 – Management

Background

Trinity Management Council

The TMC has management responsibility for the Trinity River fishery restoration goals and implementation actions described in the ROD and Implementation Plan. The TMC functions as a board of directors that sets the priorities and schedules for strategic implementation by the Executive Director and determines when corrective actions are required. This shared responsibility of the TMC assumes participation and support from each member organization.

Executive Director

The Executive Director is the primary advocate for the Program. The Executive Director must propose tactical priorities and schedules for approval by the TMC. The Executive Director must submit an annual flow schedule and assessment design to the TMC for approval, and lead coordination of activities within the AEAM staff and among the TMC, TAMWG, regulatory agencies, and the general public, ensuring a common understanding of progress toward the achievement of the Program goals and objectives.

Adaptive Environmental Assessment and Management Team

The AEAM staff provides technical support to the TMC as it relates to design, scientific assessment, and implementation of restoration activities. The team is subdivided into two groups, the RIG and TMAG. The TMAG is responsible for the science component of the AEAM program and provides Program direction based on scientific underpinnings of the AEAM program. The RIG is responsible for the on-the-ground implementation activities such as infrastructure modifications, channel rehabilitation, and coarse sediment augmentation. The RIG is also responsible for contracting duties.

Trinity Adaptive Management Working Group

The TAMWG is a Federal Advisory Committee Act (FACA) chartered group, charged with representing the stakeholder interests related to the restoration of the Trinity River fishery resources. The TAMWG provides management recommendations to the TMC.

Scientific Advisory Board

The SAB reviews the annual assessment designs for the selected annual flow schedule, reviews long-term trend monitoring designs and reviews significant changes in objective specific assessment designs. The SAB reviews TMAG model use and analytical processes, and peer reviews final reports of Program studies and research projects. The SAB also conducts a periodic review of the Program performance.

Expert Review Panels

Additional panels or committees will review objective specific proposals or activities. For each objective specific activity, an expert review panel composed of subject area experts, not directly involved with the proposed project or other conflict of interest will be solicited to provide review and recommendations on proposals submitted in response to RFPS.

Findings

1. TMC members are not sufficiently engaged in the Program to fulfill the board of directors role necessary for the management of the Program. Quarterly, one-day meetings are not sufficient for TMC to provide management oversight and guidance. There appears to be insufficient utilization of AEAM staff and TMC technical representatives to provide the TMC with the best available information upon which to make sound management decisions.

2. There is a strong perception that the Program is run by USBR and not by a multi-agency group that functions as a board of directors.

3. There is no process used by the TMC or the AEAM staff for tracking the implementation of the ROD and Implementation Plan. The measure of success has been incremental progress rather than full implementation of the ROD and Implementation Plan.

4. The present strategic planning process does not appear to be incorporating the overall strategies described in the Flow Evaluation Report, or creating tactical plans for accomplishing the ROD and Implementation Plan objectives and timelines. Rather, the impression is that the Program is trying to reinvent the science and conduct basic research instead of focusing on implementing the actions laid out in the Flow Evaluation Report, ROD, and Implementation plan. Additionally, the planning and design activities associated with the construction and restoration efforts appear to be conducted in series rather than along parallel tracks due to staffing and management limitations.

5. Establishing the science framework of the AEAM program has not been a priority to date for the AEAM staff. While the establishment of the science framework has been initiated through a contract with a consultant, the foundation and leadership of the science for the Program must come from within the Program, specifically the TMAG.

6. The Program lacks the modeling and assessment capabilities necessary for the AEAM program. TMAG staff positions were not advertised to recruit persons with strong modeling and assessment skills, and this component of the Program is still in need of staffing with qualifications in line with those identified in the Implementation Plan. TMAG staff have been primarily working on contract management and permitting tasks.

7. Senior AEAM staff are reluctant to seek assistance from TMC, e.g. in areas of increased staffing needs and overcoming obstacles to timely implement the ROD and Implementation Plan. The staff is moving forward with a schedule for completing the rehabilitation projects over a 20+ year period and has not requested of the TMC for more staffing or other suggestions for achieving the bank rehabilitation schedule identified in the ROD and Implementation Plan. AEAM staff cited specific examples of limitations in getting permits for infrastructure and channel rehabilitation activities as a major issue slowing progress. AEAM staff have been diverted almost exclusively to contracting efforts related to bridge replacement, financial agreements, and permitting.

8. There is some misunderstanding of the roles intended for the TAMWG, SAB, and ERPs in building a science base and facilitating Program implementation.

Recommendations

1. The TMC needs to become more engaged in the management of the Program by providing significant oversight and guidance to AEAM staff through the Executive Director. The TMC needs to fulfill its board of directors role to improve progress in attaining the goals and objectives contained in the ROD and Implementation Plan. The TMC needs to consider the completion of the Implementation Plan as a project. The TMC and TAMWG need to track the Implementation Plan status in a format that is easily conveyed, such as a Gantt chart. Gantt charts are an important management tool that will identify critical paths that impede timely implementation. An example of the Implementation Plan in a Gantt chart format is shown in Figure 1.

2. In addition to the quarterly TMC meetings, monthly conference calls should be initiated to provide the opportunity for the TMC and Executive Director to discuss Program progress and challenges, and improve TMC guidance and oversight of the Program.

3. The TMC, TAMWG, and the AEAM staff should develop the strategic plan with the Flow Evaluation Report, ROD, and Implementation Plan as its foundation.

4. The science component of the AEAM program must be developed. Without the science component, implementing management actions are not guided by science and assessments of management actions are greatly impaired. The Subcommittee strongly recommends that the science framework must be in place so that assessments of current conditions can be made and follow-up assessments resulting from management actions (flow, channel rehabilitation, gravel supplementation) be completed.

5. Restaffing of the TMAG vacancies with scientists aligned with the qualifications described in the ROD and Implementation Plan is necessary. Eliminate the current contracting burden on TMAG modeling and assessment staff by adding or realigning current staff to function as Contracting Officer Technical Representatives (COTR). Based on Subcommittee observations and interviews with AEAM staff, there is no evidence suggesting that the original organization plan and staff descriptions in the ROD and Implementation Plan should be changed; however, unanticipated additional COTR responsibilities necessitates additional TMAG staff as shown in Figure 2. More specific staffing recommendations have been discussed by the Subcommittee, but are avoided in this document because these recommendations encroach on personnel issues.

6. The Executive Director should seek TMC help in challenging institutional barriers and overcoming any USBR procedures that may hamper innovation in pursuing Program objectives (i.e. grade level for senior staff, travel ceilings, etc.). The TMC must be informed of any obstacles arising that would delay timely implementation of the ROD mandated Trinity River fishery restoration program.

7. The TMC should work with the Executive Director on the rehabilitation site permitting issues, CEQA, etc. and become engaged in development of an overall programmatic permit process. TMC members must assist in this effort within their own agencies by educating regulatory agencies, and, if needed, elevating it to the Secretary of the Interior or other appropriate decision makers.

8. The TMC should develop a more formal organization process for coordination among AEAM staff, TAMWG, and TMC technical representatives. The Subcommittee recommends forming smaller technical committees to collaborate on specific resource areas (e.g. sediment transport channel geomorphology, fish habitat, fish physiology and population dynamics, riparian vegetation and floodplain habitats, etc.). Two of these subcommittees have already been formed out of necessity; others also need to be formed. A recommended structure for this organization is provided in Figure 3.

9. A plan for future Program review needs to be established. First, the TMC should be conducting continued Program review via tracking Program progress on implementing the ROD. Second, the procedure for SAB review of the Program needs to be developed after the SAB is brought up to speed. Lastly, the TAMWG and other Program participants must be kept more informed of Program's progress, challenges, and accomplishments via increased outreach in order to provide the best possible input to the Program.

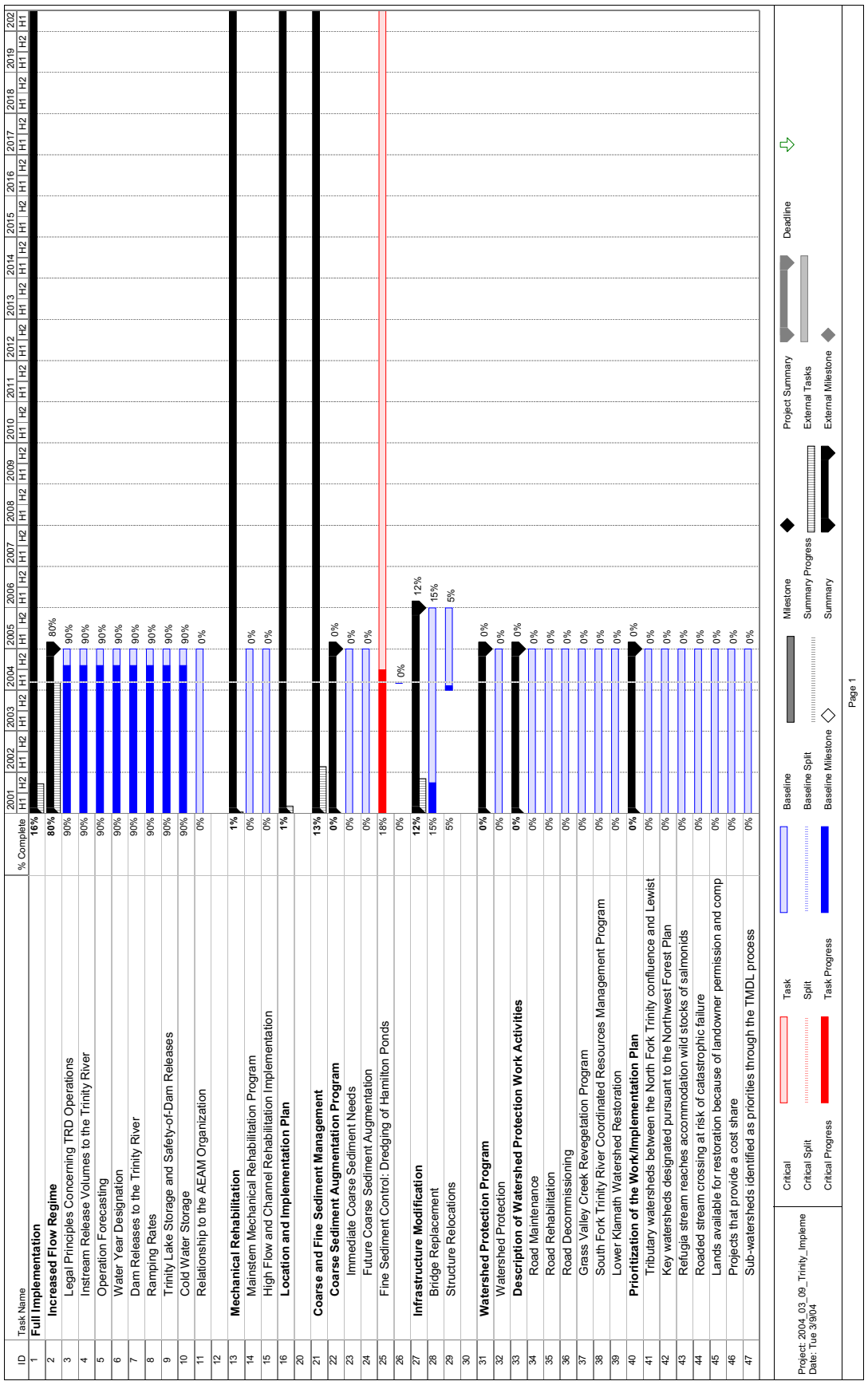

Figure 1. Example Gantt Chart of Implementation Plan components that should be used by Program to improve project management, identify critical paths, and improve contingency planning

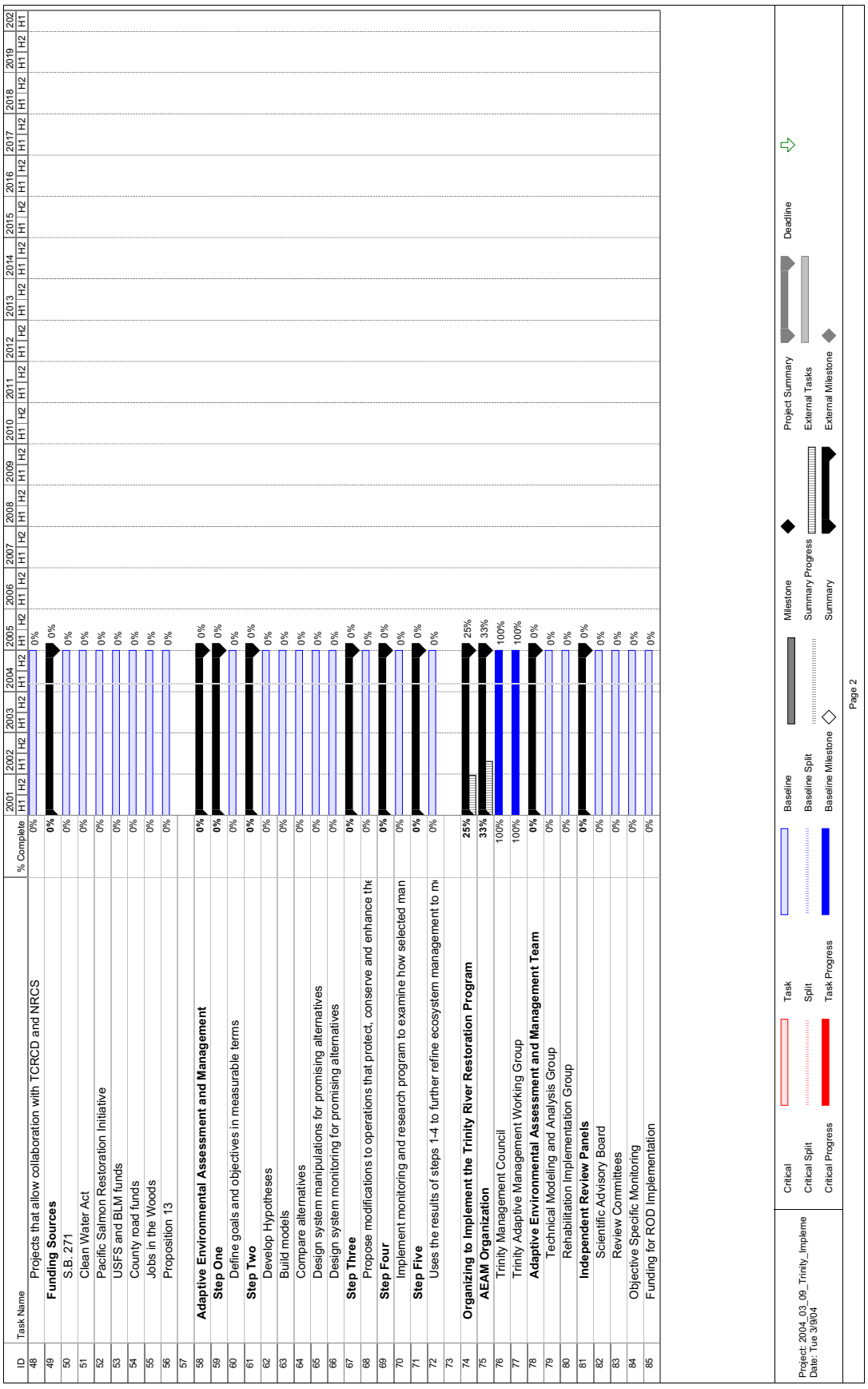

Figure 1. Continued.

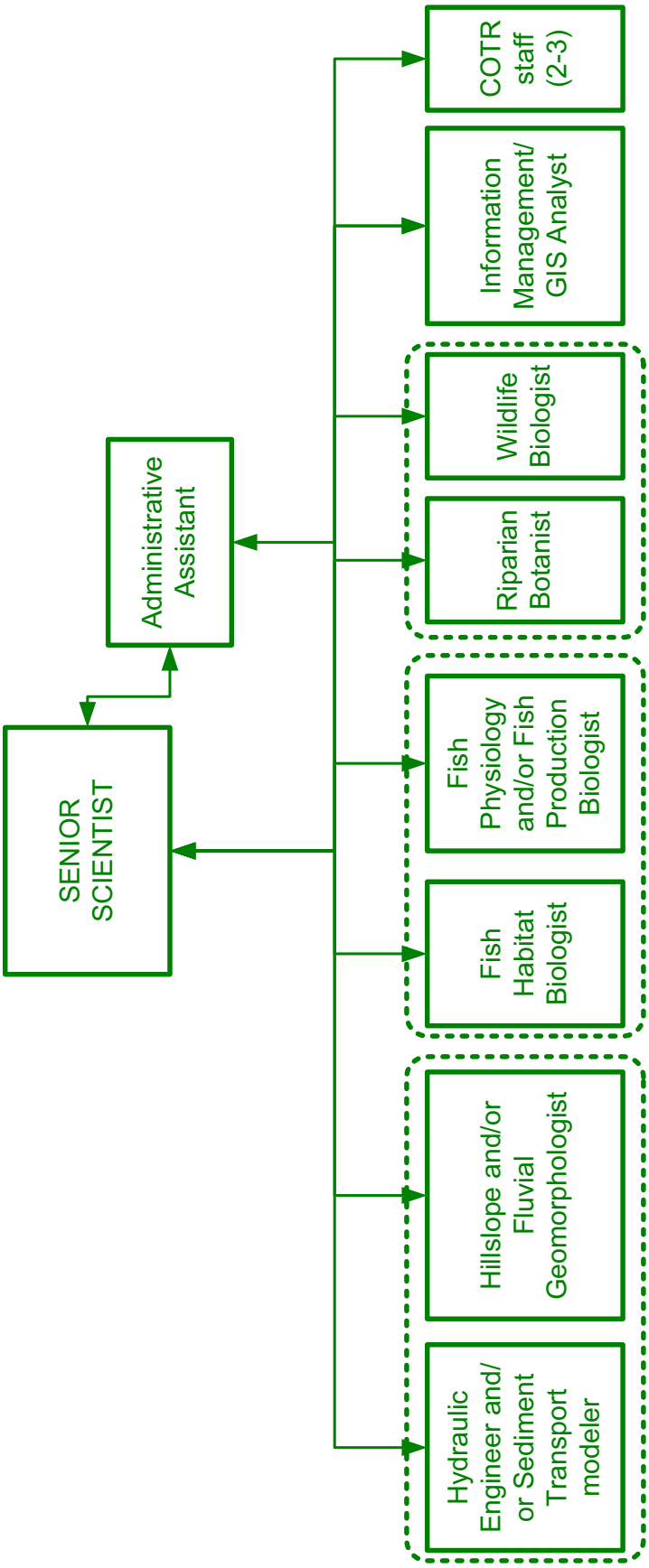

Figure 2. Adjusted TMAG staffing recommendations based on Implementation Plan, Subcommittee observations, and AEAM staff input.

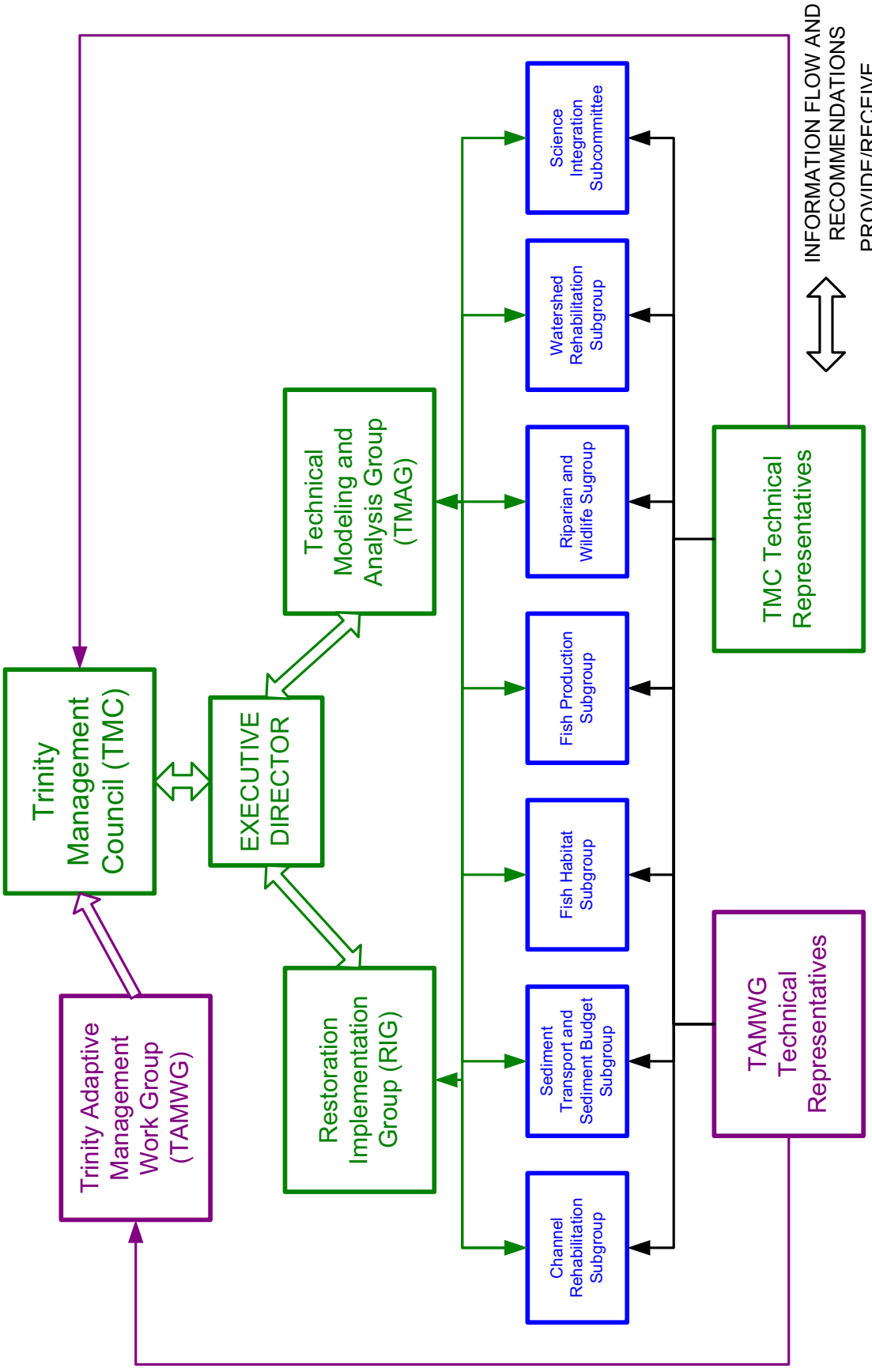

Figure 3. Recommended technical subcommittee structure to enable technical participation of TMC and TAMWG technical representatives. TMAG staff would lead groups, and technical input from TMC and TAMWG technicial representatives would be provided on study needs, sampling design and strategy, and alternative hypotheses. TMAG would consider this technical input (but not required to accept input), and make appropriate reccomendations to the TMC for priority study/monitoring needs, flow management, sediment management, and rehabilitation activities based on thier technical review and analyses.

SUMMARY OF IMPLEMENTATION PLAN, CURRENT STATUS, AND NEEDED CORRECTIONS

Success of the Program relies on the effective implementation of all components of the Implementation Plan. Until such time when all components are in place and a functioning science-based Adaptive Management program is being implemented, the Program will not be able to determine whether it is successful or not. The Subcommittee used the Implementation Plan as a guide to evaluate the actual Program accomplishments and direction to date.

The Implementation Plan contains seven sections:

1. Increased Flow Regime (Section 1)
2. Mechanical Rehabilitation (Section 2)
3. Coarse and Fine Sediment Management (Section 3)
4. Infrastructure Modifications (Section 4)
5. Watershed Protection (Section 5)
6. Adaptive Environmental Assessment and Management (Section 6)
7. Organization For Implementation (Section 7)

The following tables provide a brief summary of the various components of the Implementation Plan, the current status of these components, Subcommittee recommendations for improvement, and recommended timelines. These tables serve to identify Program divergence from the Flow Evaluation Report, Implementation Plan, and ROD. The Subcommittee did not fully summarize actual work that is moving ahead on schedule in these tables. Recommended timelines are based on information contained in the implementation plan or on the importance of various components in fulfilling the needs of the Program. It is expected that the TMC will evaluate these recommended timelines and adjust as appropriate.

Table 2. Summary of flow component of the Implementation Plan, current status of implementation, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• Release flows within annual water year class allocation to address annual and long-term management objectives based on current assessments and modeling analyses. • Flows in excess of 6,000 cfs would not be able to be released until infrastructure modifications were completed by the spring of WY2003 (April 2003).	• Due to court order, instream allocations are limited to 369,000 acre-feet in critically dry years and 453,000 acre-feet in Dry or wetter water years. • There is some reluctance to release hydrographs that vary from those contained in the Implementation Plan. • In WY03 and WY04, efforts to develop objective-based flow recommendations were initiated. • In WY03, the flow schedule was modified to mimic the temperature objective bench of the wet water year hydrograph as much as possible within the 453,000 AF allocation. • An additional 33,000 AF was released in the fall to improve conditions in the lower Klamath River. • Some predictive modeling analyses (primarily sediment transport and some water temperature) were conducted to help develop and/or evaluate proposed flow schedules.	• Formalize annual flow planning process to meet annual water year class objectives based on assessment information from previous years and modeling analyses for current water year. A draft procedure to develop sediment transport based high flow schedule has been developed and other components (i.e. temperature) need to be added (October 2004). • Implement annual flow releases that address year-specific objectives (March 2005). • Develop and apply predictive models to assist with the development of annual hydrographs (December 2004). • Acquire expertise within the TMAG team to conduct predictive modeling and assessment tasks necessary to develop annual flow recommendation for the TMC and provide Program evaluation. (also see TMAG section). • Direct monitoring and assessment projects so they are guided by information needs to better implement and evaluate the ROD flows (December 2004).

Table 3. Summary of channel rehabilitation component of the Implementation Plan, current status of implementation, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• 44 potential channel rehabilitation projects and 3 side channel projects were identified. • 24 of the sites would be constructed in the first 3 years of the Program. • The remainder of the sites would be constructed following evaluation of the effectiveness of the first 24 projects • TMAG would lead the science-based implementation of rehabilitation projects (site selection, geomorphic and biological design, and geomorphic and biological monitoring). • RIG would provide input on site selection and construction, and would lead implementation of the projects.	• Partial designs for two channel rehabilitation projects have been completed and may be constructed in 2005. • AEAM staff expect that it will take 10-12 years to complete the first 24 sites. • The Mainstem Restoration Subcommittee developed a priority list for the first 25 restoration sites in 2002. • Litigation has delayed implementation of the channel rehabilitation projects and channel rehabilitation planning activities have focused on downstream reaches because of litigation imposed flow limitations. • Environmental compliance has been initiated, but not completed for any of the projects due to staff workload, unanticipated level of effort, and regulatory constraints. • Contracts are in place to conduct additional designs but additional sites have not been selected. • Subsequent to the Implementation Plan and as a result of litigation, the plan was to design two years worth of projects (16) to have "on the shelf" and to get them permitted. • Environmental compliance requirements have greatly impacted the schedule to complete the channel rehabilitation projects as outlined in the Implementation Plan schedule.	• Construction of the first 24 channel rehabilitation sites in a short time frame (3 years) is necessary to change the channel morphology and increase fish habitat to enable measurement of increased juvenile salmonid production (2005-2008). • Develop a schedule and resource needs for completing the construction of the first 24 channel rehabilitation sites between 2005-2008 (June 2004). • TMC needs to make an immediate (April meeting) determination on what effect, if any, the litigation has on channel rehabilitation implementation and schedule. • Reevaluate the Mainstem Restoration Subcommittee's priority channel rehabilitation sites, without litigation constraints, and develop a science-based implementation strategy to select priority rehabilitation sites for design (July 2004). • Initiate the preliminary designs for the prioritized 24 sites so environmental compliance activities can commence (immediately following July 2004 prioritization above). • Obtain TMC assistance on environmental compliance hurdles (Immediately). • TMC and AEAM staff need to develop a process to streamline restoration project environmental compliance processes (July 2004). • More formalized project management should be performed so that rehabilitation associated tasks can be done in parallel (June 2004).

Table 4. Summary of coarse and fine sediment management component of the Implementation Plan, current status of implementation, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
Sediment Management		
• Flow magnitude and duration to transport Rush Creek materials, mobilize river bed, and scour river bed.	• Monitoring has been conducted of sediment supplies from creeks, mainstem sediment transport, and bed mobilization and scour.	• Continue monitoring sediment supply, transport, and bed mobility and scour (ongoing). • Continue calibrating GSTARS (ongoing).
Coarse Sediment		
• Immediate coarse sediment augmentation of 10,000 cubic yards in the 1,500 foot reach immediately below Lewiston Dam and 6,000 cubic yards at the USGS cableway site at Lewiston. • Develop local sources of coarse sediment using dredge tailings. • Future coarse sediment augmentation (volumes and locations) would be determined by the AEAM staff based on annual assessments. • If needed, mechanical manipulation of Rush Creek and Indian Creek deltas.	• In FY03, 2,000 cubic yards of coarse sediment were placed at the USGS cableway site at Lewiston. • No coarse sediment storage monitoring except at deltas. • 2-D model built at Lewiston Hatchery reach to assist with gravel introduction in that reach. • A draft coarse sediment management plan has been completed and the inriver sediment budget has been revised in January 2004. • GSTARS model has been developed for the reach between Lewiston Dam and Salt Flat. Currently being expanded to include the reach from Indian Creek to Weaver Creek. • Draft designs for Rush Creek delta manipulation completed.	• Finalize and implement the coarse sediment management plan (August 2004). • Finish the remainder of the immediate coarse sediment augmentation in accordance with original recommendations and any modifications by the coarse sediment management plan (September 2005). • Inchannel coarse sediment monitoring is needed Develop instream coarse sediment monitoring plan (August 2004) and implement (December 2004). • Conduct feasibility and cost evaluation of using local dredge tailings for coarse sediment augmentation (August 2004). • If feasible, develop local coarse sediment sources in areas that can also be restored as functional floodplains (August 2004). • Complete evaluation of Rush and Indian Creek delta manipulations (August 2004).
Fine Sediment		
• More rigorous maintenance of the Grass Valley Creek sediment ponds (Hamilton Ponds) is needed to maintain their trapping efficiency of fine sediments and reduce the risk of fine sediments being delivered into the mainstem Trinity River by Grass Valley Creek. • If needed, dredge sediment pools in the mainstem.	• Funding has been made available to excavate Hamilton Ponds more frequently. • Fine sediment budget completed in 2004. • Fine bedload and suspended sediment transport rates monitored in mainstem. • No inchannel fine sediment monitoring is being conducted. • Grass Valley Creek watershed rehabilitation assessment ongoing.	• Ensure that the Hamiliton Ponds are maintained to prevent fine sediment from Grass Valley Creek being delivered into the Trinity River (ongoing). • Evaluate the ROD flows with respect to the revised fine sediment budget to consider pool dredging needs (August 2004). • Dredge Hamilton Ponds in between winter storms if needed (ongoing). • Develop a plan and begin monitoring in-channel fine sediment (Plan - August 2004, Monitoring –December 2004).

Table 5. Summary of watershed component of the Implementation Plan, current status of implementation, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• Watershed protection and restoration activities in the upper tributaries (Rush, Hoadley, Indian Creeks) including road maintenance, road rehabilitation, road decommissioning, and revegetation activities. • Implementation and coordination with Grass Valley Creek Revegetation Program, the South Fork Trinity CRMP, and the Lower Klamath Watershed restoration. • No timeline was identified for completion of watershed activities. It is expected to be a long term (~20 year) effort due to the magnitude of the activities.	• A contract with USGS has been established to evaluate the most cost effective and sediment reduction effective means for watershed rehabilitation. • Some watershed rehabilitation activities are being conducted. • Monitoring of fine and coarse sediment delivery from Deadwood, Rush, Indian, and Grass Valley Creeks is occurring.	• Develop an integrated and comprehensive watershed restoration strategic plan in cooperation with land owners/managers (September 2005). • Implement watershed rehabilitation projects that best reduce fine sediment contribution to the Trinity River in the most cost effective manner (September 2005). • Evaluate and decide on whether sedimentation basins are needed and feasible at Hoadley, Rush, and Indian Creeks (September 2005). • Hire a TMAG scientist with hill-slope process and geomorphic background to lead Program's watershed rehabilitation program (September 2005).

Table 6. Summary of infrastructure modifications component of the Implementation Plan, current status of implementation, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
Infrastructure Modifications		
• All bridge construction was intended to be completed by late 2001 to late 2002. This objective assumed initially that pre-construction activities were to begin in the summer of 2000, with a 17 to 28 month project duration timeframe.	• Bridge design, contracting, permitting, and surveying have been ongoing since 2001, and the current schedule has all four bridges being competed by December 2004.	• Ensure that all four bridges are constructed by December 2004.
• Home and structure relocations were to begin in summer of 2000, with an 18 month project duration. All structure relocations were intended to be completed by early 2002.	• Trinity County has initiated activities on three structure relocations: the yellow house, Poker Bar bridge approach, and the Salt Flat well.	• Ensure that all structure relocations are completed prior to high flow releases to avoid damages resulting from ROD high flow releases (May 2005).

Table 7. Summary of TMC component of the AEAM program from Implementation Plan, current status, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• TMC functions as a board of directors, providing leadership and management direction for the entire Trinity River Restoration Program, and specifically the AEAM team through the Executive Director. • TMC determines final funding allocations/ priorities based on recommendations provided by the AEAM team and reviews TMAG's recommendations concerning annual flow schedules and determines the final annual flow schedule to be forwarded to the USBR for incorporation into operation planning. • TMC coordinates with other management entities concerning actions related to Trinity River restoration actions. • TMC hires and supervises the Executive Director and reviews personnel actions recommended by the Executive Director.	• TMC members, along with other entities associated with the Program, have varying levels of understanding and different interpretations of the Implementation Plan. • TMC meets infrequently (quarterly), not all members have been briefed on the vision and objectives of the Flow Evaluation Report, ROD, and Implementation Plan. • Impression that USBR runs the Program. • Lack of information flow from the AEAM team and TMC technical representatives to TMC. • Inconsistent involvement in budget process. • TMC has provided little management guidance to AEAM staff, especially pertaining to Program priorities and planning efforts. • TMC coordination with other management agencies, especially pertaining to implementation issues, is not occurring to a sufficient level to address issues. • TMC has not been engaged in staffing and personnel actions concerning AEAM staff. Appearance that USBR manages the Executive Director rather than the TMC. TMC is not aware of significant personnel issues.	• The TMC, along with all other components of the Program (AEAM staff, and TAMWG) must develop a collective vision and understanding of the Program as outlined in the Implementation Plan (April 2004). • TMC needs better engagement in setting Program priorities and facilitating Program implementation with regulatory agencies (Immediately). • TMC needs to direct the Program through Executive Director (Immediately). • TMC needs to increase its management of the Program so it is directed as a team or board of directors. Increase TMC meetings via monthly conference calls and/or executive meetings (Immediately). • TMC needs to be reminded of funding priorities by TMAG and of any changes in funding allocations. TMC must have access to TMAGs documentation of proposal review, decision making process, and reasons for approved and rejected proposals (Immediately). • Create technical subcommittees for TMC technical representatives to participate in the Program. This will facilitate information transfer by allowing technical representatives to brief their TMC members (Immediately). • Senior Scientist and RIG leader should explain funding recommendations to TMC for FY05 funding cycle (June 2004). • TMC must engage in personnel issues, including improving the recruitment process (Immediately).

Table 8. Summary of Executive Director of the AEAM team from Implementation Plan, current status, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• Executive Director is responsible for coordination of all Program activities and implements the policy and management decisions of the TMC. • Executive Director is the link between the policy/management component (TMC) of the AEAM Program and the scientific and implementation component (TMAG, RIG, SAB) of the Program, as well as the stakeholder/public component (TAMWG). • Executive Director coordinates activities of the TMC, TAMWG, SAB, ERPs, regulatory agencies, agencies supporting the Program, and the public. • Executive Director supervises the AEAM team (TMAG, RIG), and develops and implements work plans to ensure that restoration Program objectives are achieved. • Executive Director forwards annual flow recommendation(s) developed by the TMAG and annual budget recommendation developed by AEAM staff to TMC for review and approval. • Executive Director coordinates flow schedule and rehabilitation activities with other agencies • Executive Director reports on progress towards restoration goals to TMC, TAMWG, regulatory agencies and the public.	• Executive Director manages the AEAM staff and all of their activities with little guidance from the TMC. Guidance primarily provide by USBR. • Provides TMC and TAMWG with updates of Program activities and accomplishments. Information flow to the TMC and TAMWG from AEAM staff is inadequate. • Program progress (accomplishments) is being done but not using the Implementation Plan timeline as the "yardstick" to measure progress. Detailed Program planning is not being done, which has led to times of "crisis management". • Overall Program planning is lacking, feeling of "crisis management" and "incremental progress" exists. • For the groups that have been formed, coordination is well done. • Strategic plan initiated. • No evidence that "work plans to ensure that restoration plan objectives are achieved" are being used in managing the AEAM team. • Flow and budget recommendations are being forwarded to the TMC, but information concerning rational and tradeoffs is sparse.	• Executive director must ensure that all aspects of the Program are being implemented in accordance with the Implementation Plan (Immediate). • Executive Director needs to inform the TMC of obstacles encountered in fulfilling the actions and timelines contained in the Implementation Plan and seek their assistance in resolving these obstacles (Immediate). • Executive director needs to facilitate greater involvement of the TMC. Needs to prompt them for management direction and assistance when necessary (Immediate). • Coordinate additional TMC meeting or conference calls on a monthly basis. More frequently, if necessary, during periods such as the spring during flow scheduling efforts (Immediate). • Program needs to be better managed, with clearer priorities (based on TMC input) and success defined by implementation and fishery restoration (Immediate). • Strategic plan must focus on what is needed to implement the ROD (objectives, tasks, and timeline) with input and guidance from the TMC. This will assist with workload management and project planning and reduce "crisis management" (Immediate). • TMC should direct the Subcommittee to assist the development of the outline for the strategic plan, and then the TMC must become involved in the development of the plan (Immediate). • Increased AEAM staff participation in TMC discussions (Immediate). • Executive Director needs to ensure that the science component of the Program is implemented and that staff have the modeling and assessment qualifications described in the Implementation Plan (Immediate). • Identify staffing needs to ensure that channel rehabilitation activities are completed in the timeline outlined in the Implementation Plan (Immediate).

Table 9. Summary of TMAG of the AEAM team from Implementation Plan, current status, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• TMAG is an interdisciplinary group of scientists with expertise in fishery science, hydrology, fluvial geomorphology, riparian ecology, watershed processes, wildlife science, and data management. • TMAG's primary role is to lead the scientific component of the Program. • TMAG conducts and oversees technical analyses of the outcomes of management actions and historical monitoring results with respect to existing hypotheses, re-visits scientific hypotheses as appropriate, and conducts modeling exercises (sediment transport, fish habitat, water temperature, and salmon production) to develop management recommendations (flow, instream restoration, watershed restoration, etc) for the TMC to consider. • The TMAG, through close coordination with the RIG, oversees scientific evaluation and design of all rehabilitation projects including: bank rehabilitation, gravel augmentation, riparian re-vegetation, floodplain creation, fine sediment management, and watershed rehabilitation.	• Most of the TMAG staff positions are vacant. • Staff qualifications are not fully aligned with Implementation Plan intended qualifications. • TMAG staff have been primarily focused on financial assistance agreements and contracts related to work associated with the Program and not with implementing the science component of the Program. • The modeling and assessment component of the AEAM program does not exist. TMAG not providing scientific leadership for the Program. • Adaptive management not being implemented and Flow Evaluation Report hydrographs are assumed appropriate. No predictive models are being used to develop hydrographs. • The limited modeling and assessment activities that do occur are conducted by consultants or staff from other agencies. • Design and evaluation criteria for the channel rehabilitation projects have not been developed. Bank rehabilitation efforts behind schedule, little input from TMAG staff on design criteria. • Scientific framework necessary for prioritizing tasks and guiding monitoring and assessment projects has not started. • A contract with a consultant (ESSA) has been established to facilitate the development of the scientific framework for the Program.	• Restaff TMAG with qualifications aligned with Implementation Plan to development in-house expertise for the modeling and assessment needs of the Program (fully staff by August 2004). • Reduce contracting burden on TMAG modeling/assessment staff by adding or realigning current staff to function as COTRs (August 2004). • Add hillslope process/geomorphologist staff to TMAG (August 2004). • Complete the scientific framework process to prioritize study/ information needs. TMAG must take a leadership role in recommending priority information needs, even in the face of political opposition (TMC needs to address political conflicts) (December 2004). • TMAG must guide the science of the Program: identify, develop, oversee, and apply predictive models to implement adaptive management (December 2004). • Increase the AEAM staff briefings/education of the TMC to improve their decision making based on objectives, logic and tradeoffs (Immediately). • Develop channel rehabilitation implementation strategy early in the scientific framework process so contractors can begin on design and environmental compliance tasks (May 2004). • Develop RFP process to focus monitoring and assessment projects on collecting information that is needed by the Program to facilitate the AEAM process (October 2004).

Table 9., Continued.

• TMAG, through the development of the science framework, transforms the assessment/monitoring/research aspect of the restoration Program from a "proposal driven process" to an "information needs driven process (RFP)" to address management questions and provide information pertinent to the management of the restoration Program. • TMAG develops and oversees short-term research projects, long-term trend monitoring development and oversight, sets standards and protocols for monitoring information, ensures effective data management, develops and submits implementation plans for scientific peer review, and coordinates review from the SAB and Review Committees.	• May need additional staff to ensure coverage of all scientific disciplines. • Significant morale problems. • Projects are still being funded that do not have a clear management application of implementing the ROD, leading to funding shortages for needed projects. • Still largely a proposal driven process, rather than a RFP process driven by Program information needs. The development of an RFP process for funding monitoring and assessment projects that meet the informational needs of the Program has not been developed. • No peer review of proposals. • TMAG now improving reporting conditions for cooperators but many contractors/cooperators are delinquent on data and reports. • Draft coarse sediment management plan completed. Little progress on implementation of other needs plans. • No structure for TAMWG or TMC technical representatives to participate is science aspect of the Program. • Two technical subcommittees, fluvial-geomorphology and wildlife, have initiated workgroups to develop coordinated monitoring and assessment programs.	• Establish remaining technical committees (fisheries, channel rehabilitation, etc.) and formalize the function and process for these committees, including the participation of TMAG and TMC technical representatives in the Program science (monitoring, modeling, hypothesis development) (May 2004). • Finalize coarse sediment management plan and initiate design of coarse sediment introduction sites (August 2004). • Integrate expertise of SAB and ERPs into the science of the Program (July 2004). • Institute performance and science-based review process for future funding. TMAG must be supported by TMC to recommend project funding based on past performance and science quality. Investigate the use of USBR scientific proposal review process. (December 2004).

Table 10. Summary of RIG of the AEAM team from Implementation Plan, current status, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• The Rehabilitation Implementation Group is comprised of engineers, technicians, and contract specialists. • The RIG's primary responsibility is to implement the on-the-ground design and construction activities associated with the Program. • While the RIG is responsible for the implementation of projects, the TMAG provides conceptual, technical, and experimental guidance concerning restoration site design, pre- and post-project monitoring, and coarse and fine sediment management projects. • RIG develops design data, prepares designs, awards contracts, and manages infrastructure modification projects, rehabilitation projects, gravel augmentation, riparian revegetation, floodplain creation, and fine sediment management projects. • RIG coordinates watershed restoration activities with appropriate land management entities. • RIG also performs all necessary realty actions, environmental permit requirements including environmental compliance, and provides contract management for all construction and monitoring activities, with technical support from the TMAG for monitoring contracts.	• RIG activities have focused on floodplain modifications, primarily the bridges. • RIG staff have been significantly burdened with contracting and environmental compliance tasks associated with the bridge and channel rehabilitation projects. This has significantly limited progress. • Implementation of channel rehabilitation projects has fallen behind the Implementation Plan schedule. • Partial designs for two channel rehabilitation sites have been completed. • Project management needs to be improved, projects need to be done more in parallel effort and better contingency planning needs to be done. • Most of the contracting functions pertaining to monitoring and assessment projects are conducted by TMAG staff. • RIG has taken the lead in implementing channel rehabilitation projects. TMAG has been unable to take the lead on this and provide information for design and environmental compliance. • Watershed rehabilitation efforts have yet to be initiated.	• RIG needs to ensure that all infrastructure modifications are completed to allow for high flows (up to 11,000 cfs) (May 2005). • RIG needs to accelerate the channel rehabilitation efforts to ensure that the first 24 sites are completed within the time period of 2005-2008. • Develop environmental compliance strategic plan with assistance from TMC (Immediately). • RIG needs to assume contracting responsibilities currently being conducted by the TMAG. Recently hired contracting officer should assume this role with assistance from COTR in TMAG (Immediately). • TMAG needs to provide technical input to the RIG concerning channel rehabilitation site selection and design as well as input concerning watershed restoration efforts (May 2004). • Hire or detail additional environmental compliance staff to assist RIG staff (Immediately). • Hire or detail staff engineer to assist group leader with project management and other RIG tasks (Immediately).

Table 11. Summary of TAMWG component of the AEAM program from Implementation Plan, current status, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• TAMWG is a stakeholder group composed of representatives of agencies and private groups with an interest in Trinity River restoration activities. • TAMWG provides stakeholders an avenue to provide management (policy) and technical (alternate scientific hypotheses) recommendations to the TMC concerning restoration efforts.	• TAMWG meets quarterly, reviews information provided by AEAM staff pertaining to the status of the Program and provides comments and recommendation to the AEAM staff and the TMC. • TAMWG has developed resource/issue area subcommittees to address specific components of the Program. • TAMWG well organized and functioning well. • No formal structure to provide technical input the AEAM staff.	• The role of the TAMWG, especially in regards to how the TAMWG interacts scientifically with the TMC, AEAM staff, SAB, etc., needs to be better defined (Immediately). • Technical subcommittees will provide structure for input by TAMWG. TAMWG may need additional technical representatives (May 2004). • TAMWG technical representative participation in technical subcommittees will better educate TAMWG members and improve their recommendations to the TMC (May 2004).

Table 12. Summary of SAB component of the AEAM program from Implementation Plan, current status, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• The SAB is composed of five scientists, recognized as experts in the disciplines of fisheries science, fluvial geomorphology, hydraulic engineering, hydrology, riparian ecology, wildlife biology, or aquatic ecology. • SAB provides overall review of management recommendations under consideration by the TMC relative to the science aspects of the AEAM organization. • Primary role of the SAB is to provide scientific peer review of hypothesis testing, proposed annual flow schedules, short and long-term monitoring plans, and research priorities. • SAB will review reports and recommendations produced by the TMAG and will provide an overall periodic review (roughly every 5 years) of the overall AEAM program.	• The SAB has recently been formed and will have its first meeting in May. • SAB not yet engaged in the Program.	• SAB needs a presentation of the restoration Program vision by Dr. Clair Stalnaker to ensure that all understand the foundation of the Trinity River AEAM program (May 2004). • SAB must review and understand their role and function and manage the SAB to provide the scientific guidance to AEAM staff for the benefit of the Program (May 2004). • Determine where and when SAB input is necessary and schedule tasks and meetings to ensure that needed input is available in a timely manner (May 2004). • Integrate SAB activities into the scientific framework process (May 2004).

Table 13. Summary of ERP component of the AEAM program from Implementation Plan, current status, actions needed to fulfill Implementation Plan, and recommended timelines.

Implementation Plan and/or Trinity River Flow Evaluation Report	Where We Are Now	Subcommittee Recommendations (Timeline)
• Additional panels or committees will be necessary to review objective specific proposals or activities. • For each objective specific activity, an ERP of subject area experts, not directly involved with the proposed project or other conflict of interest, will be solicited to provide review and recommendations on proposals submitted in response to RFPs. • ERPs will be formed to review specific proposals and study designs, and to provide input and recommendations relative to personnel qualifications and experience, study approach, statistical design, adequacy of proposed budget, etc.	• No EPRs have been formed.	• Executive Director and TMAG lead need to develop discipline specific ERPs and lists of potential reviewers for peer review of proposals and study designs (July 2004). • Form ERPs and coordinate their efforts into the SAB and science framework efforts (July 2004).

CONCLUSION

The charge of the Subcommittee was to evaluate the current status of the Program, in the context of the ROD and Implementation Plan, and make recommendations as to what needs to be done to fulfill the intent of the ROD and Implementation Plan. As part of this effort, the Subcommittee was asked to define what success "looks like", where the Program is today, what are the limiting factors impeding implementation of the ROD, and recommendations as to the most immediate obstacles impeding implementation.

The measure of success for the Program is implementation of all components of the ROD and Implementation Plan and ultimately restoration of the fishery resources of the Trinity River. The Implementation Plan is the foundation of the Program and should be used as the gage for success while the ultimate goal of fishery resource restoration will be determined through the assessment component of the Program.

The primary finding of the Subcommittee is that critical components of the ROD are not being implemented as directed by the intent and timeline of the Implementation Plan. The AEAM team is working very hard to implement tasks, and should be recognized for its hard work; however, several factors are limiting their progress (e.g., permitting and contracting workload, management, lack of modeling and assessment staff). The Flow Evaluation Report, Implementation Plan, and ROD provide a carefully developed guide to implement Trinity River restoration. With the exception of additional short-term staff needs, the Subcommittee found no reasons for any significant changes to the Implementation Plan.

The secondary findings of the Subcommittee are that: (1) adaptive management is not occurring, and (2) the Program is substantially behind schedule in channel rehabilitation construction and implementation of the science-based programs. The ROD flow regime is under litigation, thus has not been fully implemented. Other components are progressing on a schedule that should not impair implementation of the flow components of the ROD (bridge replacement and infrastructure improvements) if completed by April 2005. Throughout all aspects of the Program, there needs to be greater urgency in attaining both the science-based aspects of the Program as well as the restoration actions.

The primary actions necessary to implement this year to get the Program realigned with the ROD and Implementation plan are:

1. Development of a science-based, AEAM program. This requires staffing the TMAG with modeling and assessment scientists, implementing the Science Framework process, establishing the SAB and ERPs and integrating them into the science program, and fully implementing a program-needs based funding process.

2. Implement channel rehabilitation projects within the schedule identified in the ROD. Add additional staff as needed and obtain greater TMC assistance to achieve this goal. Large-scale changes to the current channel morphology are necessary to increase fish habitat and to be able to measure increases in smolt production.

3. Increased management involvement and planning, especially by the TMC and Executive Director. This is especially important considering the current status of the Program and the need for collective efforts of all parties to facilitate achievement of the Implementation Plan.

Implementing recommended improvements to the Program will help us move closer to a successful restoration of the Trinity River fishery resources. The problems identified by this Subcommittee are not incurable, but require immediate attention in order for the Program to successfully implement the ROD in a timely and meaningful manner. The TMC Subcommittee should be used as a resource to assist the Program in addressing the recommendations contained in this report. Correcting these problems now will lead to greater restoration success, stakeholder buy-in, and broader public support that will ensure the long-term success of the Trinity River Restoration Program.

APPENDIX A

IMPLEMENTATION PLAN

Implementation Plan for the Preferred Alternative of the Trinity River EIS/EIR

The proposed action consists of 6 components: 1) an increased flow regime and associated OCAP for managing releases and reservoir levels; 2) a channel rehabilitation program (mechanical rehabilitation); 3) a coarse and fine sediment management program; 4) infrastructure modifications; 5) upslope watershed restoration; and 6) an Adaptive Environmental Assessment and Management organization.

1. Increased Flow Regime and Trinity River Operating Criteria and Procedures

1.1 Legal Principles Concerning TRD Operations

In section 3406(b)(23) of the Central Valley Project Improvement Act (CVPIA) (Public Law 102-575, 106 Stat. 4600, 4720), Congress called for the development of operating criteria and procedures (OCAP) for the Trinity River Division (TRD), along with recommendations for necessary instream fishery flow requirements, for the restoration and maintenance of the Trinity River fishery. Accordingly, this document describes the legal principles and scientific recommendations that apply to TRD operations and establishes OCAP required for the proper operation of the TRD consistent with those principles and recommendations.

This section briefly describes the legal principles that apply to the operations of the TRD. A detailed description can also be found in the FEIS/EIR, chapter 1.

In 1955, Congress authorized the construction and operation of the TRD (Public Law 84-386). Although Congress authorized the TRD as an integrated feature of the Central Valley Project, the authorizing legislation also directed the Secretary of the Interior to ensure the preservation and propagation of the Trinity River's fish and wildlife resources. A 1979 Solicitor's Opinion stated that the 1955 Act thus required sufficient in-basin flows determined by the Secretary as necessary for fish and wildlife to take precedence over exports of Trinity River flows to the Central Valley. *Proposed Contract with Grasslands Water District* (Dec. 7, 1979). Following construction and operation of the TRD in the early 1960s, substantial fish populations declines occurred. A 1980 EIS concluded that insufficient stream flows in the Trinity River represented the most critical limiting factor. Therefore, Secretary Andrus initiated the Trinity River flow study in 1981 to determine necessary instream flows in the Trinity River and other measures necessary to restore and maintain the Trinity River fishery consistent with the statutory directives of the 1955 Act and the federal government's trust responsibility to the Hoopa Valley and Yurok Tribes.

Congress reiterated the importance of the Trinity River fishery in subsequent legislation. In 1984, Congress passed the Trinity River Basin Fish and Wildlife Management Act (Public Law 98-541) that established a goal to restore the basin's fish and wildlife populations to

those that existed prior to construction of the TRD and directed the Secretary to implement measures to restore fish and wildlife habitat in the Trinity River. In re-authorizing this legislation in 1996 (Public Law 104-143), Congress further elaborated on the restoration goal, stating that restoration would be measured "not only by returning adult anadromous fish spawners," but also by the ability of dependent tribal, commercial, sport fishers to enjoy the benefits of restoration through a harvestable fishery resource.

With regard to tribal fishing rights, the Solicitor issued an opinion entitled "Fishing Rights of the Yurok and Hoopa Valley Tribes," M-36975 (Oct. 4, 1993). The Opinion recognized the historic dependence of the area's Indians upon the fishery resources of the Klamath River Basin (including the Trinity River) for subsistence, ceremonial, and economic purposes; determined that the Yurok and Hoopa Valley Tribes have federally reserved fishing rights as a result of this dependence and the subsequent establishment of their reservations; and concluded that the Tribes were entitled to an allocation of the Klamath Basin fishery harvest sufficient to support a moderate standard of living, but no more than 50 percent of the annual harvest allocation. However, during times of shortages tribal fisheries may take priority over other fisheries (Solicitors Opinion, footnote 39). The Opinion also stated that protection of these rights could affect off-reservation activities. Under the Magnuson Fishery Conservation and Management Act (16 U.S.C. § 1801 *et seq*.), the Department of Commerce adopted the Solicitor's determinations in an interpretative rule that restricted ocean harvest. 58 Fed. Reg. 68063 (Dec. 23, 1993). The Solicitor's Opinion and the subsequent rule were upheld by the United States Court of Appeals for the Ninth Circuit in *Parravano v. Babbitt*, 70 F.3d 539 (9th Cir. 1995).

Perhaps most significantly, Congress passed the CVPIA in 1992 that further addressed, *inter alia*, the need to restore the Trinity River and its resources. In section 3406(b)(23), Congress directed the completion of the flow study initiated by Secretary Andrus "in a manner that insures the development of recommendations, based on the best available scientific data, regarding permanent instream fishery flow requirements and [TRD OCAP] for the restoration and maintenance of the Trinity River fishery." Congress also provided for interim minimum flows to be continued in the Trinity River, consistent with a prior administrative decision by Secretary Lujan, pending completion of the flow study. The section further provided that, if the Secretary and the Hoopa Valley Tribe concur in these recommendations, then any increased instream fishery flows and the OCAP "shall be implemented accordingly." Thus, in meeting the statutory requirements of developing instream fishery flow requirements and TRD OCAP, Congress incorporated the previously recognized goals and rationale for the restoration of the Trinity River fishery, stating that the purposes of these efforts were "to meet the Federal trust responsibilities to protect the fishery resources" and "to meet the fishery restoration goals" of the 1984 Act.

It should also be noted that operations of the TRD must also be consistent with other applicable laws. For example, pursuant to the Endangered Species Act (16 U.S.C. § 1531 *et seq*.), TRD operations must avoid jeopardizing threatened coho salmon and associated critical habitat, as well as affirmatively taking actions to conserve listed species. Under the Clean Water Act, the Trinity River has been listed as an impaired water body by the State of California, and the State's Water Quality Control Plan for the North Coast Region states that "flow depletion" by TRD diversions to the Central Valley are a major cause of the river's impaired status in terms of sediment. The State of California's Water Resources Control

Board has also addressed the needs of the Trinity River, *e.g.*, a 1990 water permit condition specifically states that TRD operations shall not "adversely affect salmonid spawning and egg incubation in the Trinity River."

These OCAP have been formulated according to the legal principles outlined above. These OCAP are designed to implement the recommendations provided in the Preferred Alternative in the FEIS/EIR in order to restore and maintain the fishery resources of the Trinity River. By determining the fishery flow requirements for the Trinity River pursuant to applicable law, including the CVPIA, the flow requirements and annual hydrology implicitly determine the surplus water available for diversion to the Central Valley. These OCAP amend and supplement those relating to the TRD in the 1992 Long-term Central Valley Project Operations Criteria and Plan (CVP-OCAP). To the extent inconsistent with the CVP-OCAP, these OCAP control.

1.2 Purpose and Use of This Document

This document provides supplemental information and guidance to support the implementation of the Record Of Decision (ROD) of the Preferred Alternative of the Trinity River Final EIS/EIR (May 2000). The Preferred Alternative increases dam releases to the Trinity River to restore the anadromous fishery resources. This document supplements and supersedes information on the Trinity River sections of the Long-term Central Valley Project Operations Criteria and Plan (LCVP-OCAP) (USBR 1992). For more detailed information regarding operations of the entire Trinity River Division of the Central Valley Project, refer to the CVP-OCAP (USBR 1992).

1.3 Instream Release Volumes to the Trinity River

Under the preferred alternative, releases to the Trinity River for salmon and steelhead restoration will vary with annual basin water runoff for the watershed upstream of Lewiston Dam (Table 1). Historical hydrology was used to delineate five water-year (WY) classes. A water year begins on October 1 and ends on September 30. Pre-dam flow records (WY1912 to 1960) from the USGS gaging station at Lewiston and post dam estimates (WY 1961 to WY 1995) of inflow into Trinity Lake were combined, ranked, and exceedence probabilities calculated. Annual instream fishery flows are based upon five water-year classes that were identified in the Trinity River Flow Evaluation Report (USFWS and Hoopa Valley Tribe, 1999).

TABLE 1
Annual (April through March) instream fishery flows for Trinity River.

Water-Year Class	Trinity River Allocation (TAF)	Annual Basin Water Runoff (TAF)[a]	Probability of Occurrence
Extremely Wet	815.2	2,000	0.12
Wet	701.0	1,350 to 2,000	0.28
Normal	646.9	1,025 to 1,350	0.20
Dry	452.6	650 to 1,025	0.28
Critically Dry	368.6	<650	0.12

[a]Based on the basin area above Lewiston Dam.

1.4 Operations Forecasting

Forecasting of hydrological conditions is an ongoing procedure that Reclamation uses to project water supply availability. This process is integral to the operations planning process whereby the current year is classified, river flow schedules are developed, and other beneficial uses of the water supply are determined.

Beginning in February, Reclamation begins forecasting the upcoming year hydrologic conditions and potential operations. Forecasts provide estimates of monthly information on water allocations, reservoir storage, instream releases, electrical generation and capacity. Forecasts are based upon precipitation and runoff conditions and snow course measurements. The runoff forecast in February is considered the first reliable forecast because more than one half of the precipitation year has occurred and snowpack measurements regularly occur. Runoff forecasts are updated in March, April, and May and are used in operational planning for the rest of the water year. Forecasts that occur later in the year are more reliable due to decreased variability of precipitation patterns. Forecasts are generally produced with 50 and 90 percent exceedence probabilities, but the 90 percent exceedence forecast is generally used for planning purposes and is required for CVP operational forecasts as a result of the 1993 Biological Opinion on Sacramento River winter run Chinook (NMFS, 1993).

1.5 Water Year Designation

Normally the water year type can be reliably determined by April 1, when maximum snow pack has occurred. To determine the water year type, annual basin runoff above the Lewiston gage is determined. Annual basin runoff is calculated by summing the amount of runoff that has occurred from October until April 1 and a volume of water that Reclamation forecasters predict (90 percent probability of exceedence) will runoff during the months remaining in the water year (i.e., April through September) using the April 1 runoff forecast projection from the California cooperative snow surveys, California Department of Water Resources, Bulletin 120. Total water runoff is then compared to the ranges in Table 1 to designate the water year class.

1.6 Dam Releases to the Trinity River

Beginning in early February, Reclamation will provide the Trinity Management Council (see the section Organizing to Implement the Trinity River Restoration Program) with a preliminary estimate of the water year classification. The Trinity Management Council (TMC) will formulate a preliminary instream fishery release schedule to the Trinity River and submit it to Reclamation for operational planning. Final decisions on the designation of the water year will be based on the April 1 runoff forecast. By April 15 of each year, Reclamation will request from the TMC, a final Lewiston Dam instream fishery release schedule. Reclamation will operate the TRD as closely to the proposed schedule as technically possible.

Initially, Lewiston Dam spring releases of 8,500 and 11,000 ft^3/s that are recommended for Wet and Extremely Wet water years, respectively, will not be released into the Trinity River due to the need to modify 4 bridges and address other existing improvements in the floodplain that may be affected by releases in excess of 6,000 ft^3/s. Peak spring releases for Wet and Extremely Wet water years will be held to 6,000 ft^3/s until sufficient construction

activities have occurred to allow for the safe release of higher spring flows. It is currently anticipated that these construction activities will preclude releasing higher (>6,000 ft^3/s) spring flows until water year 2003 (See Footnote in Attachment 1).

Attachment 1 provides an average daily flow rate in cubic feet per second for Lewiston Dam releases to the Trinity River. Though the annual Trinity River fishery volumes will follow those identified in Table 1 according to water year type, the daily releases may be changed in magnitude and/or duration at a future date to achieve fishery resource restoration goals in the Trinity River. Potential changes will be identified and referred to Reclamation for action by the TMC, the decision-making group of the Adaptive Environmental Assessment and Management (AEAM) organization and consistent with all applicable laws.

In October 1991, the State Water Resources Control Board established temperature objectives for the Trinity River, that were approved by U.S. Environmental Protection Agency as Clean Water Act standards in March, 1992 (Table 2). To assure the objectives are met, flows of at least 450 ft^3/s are scheduled during the summer until October 15th, after which ambient conditions are typically cold enough to warrant reducing flows to 300 ft^3/s.

TABLE 2
Temperature Objectives for the Trinity River.

Time Period	Daily Average °F (not to exceed)	River Reach
July 1 to September 14	60	Lewiston to Douglas City
September 15 to October 1	56	Lewiston to Douglas City
October 1 to December 31	56	Lewiston to the Confluence with the North Fork Trinity River

1.7 Ramping Rates

The rate at which dam releases increase or decrease are an important fishery concern as is the ability to respond to rare hydrologic events that can risk dam safety. Acceptable rates of change can vary with time of the year or day, species, water temperature, fish distribution and channel morphology. Rates of decreasing flow are particularly important to reduce stranding of salmon and steelhead fry. The criteria in Table 3 have been suggested by the USFWS (Memorandum from the USFWS to USBR, February 5, 1997) and have been used by Reclamation since 1997. These criteria supersede those provided in the LCVP-OCAP (USBR 1992). Scientific justification for these rates is provided in Attachment 2.

TABLE 3
Criteria for releases to the Trinity River from Lewiston Dam.

Lewiston Dam Release (ft^3/s)	When Increasing Flow[a]	When Decreasing Flow[b]
At or above 6,000	1,000 ft^3/s per 2 hours	500 ft^3/s per 4 hours
6,000 to 4,000	1,000 per 2 hours	400 per 4 hours
2,000 to 4,000	500 per 2 hours	200 per 4 hours
500 to 2,000	250 per 2 hours	100 per 4 hours
300 to 500	100 per 2 hours	50 per 4 hours

[a]Criteria are based upon the 1992 LCVP-OCAP (USBR 1992), and dam releases can increase anytime during the day.

[b]Criteria are based upon a recommendation from USFWS for November 1 thru April 15, and dam decreases to flow are recommended only during the night. After April 15, decreases can occur anytime during the day.

Activities of the Preferred Alternative, such as increased river flow and mechanical manipulations, will alter the existing stream channel. As such, the ramping rates provided in Table 3 may be refined at a future date. The TMC, through the AEAM organization, will evaluate ramping rates identified in Table 3 to meet fishery resource restoration objectives.

1.8 Trinity Lake Storage and Safety-of-Dam Releases

Lake storage targets established for the period between November 1 and March 31 identified in the LCVP-OCAP (USBR 1992) are established to attempt to maximize storage and beneficial uses of stored water (for hydropower production and irrigation and M&I water supplies in the Central Valley), as well as to minimize the risk of catastrophic dam overtopping. Storage in Trinity Lake is regulated within the powerplant capacity to storages shown in Table 4. When storage targets are exceeded, Reclamation releases excess water from Trinity Dam, that is then discharged to the Trinity River or to the Sacramento River through the Clear Creek Tunnel. Such releases are termed Safety-of-Dam (SOD) releases. When such releases occur, the quantity of water used will not be considered part of the fishery's year class annual allocations.

1.9 Cold Water Storage

Availability of cold water throughout the spring, summer, and fall are important criteria that affect downstream fishery resources. To assure water temperatures are suitable for salmonids in the Trinity River, Reclamation operates Trinity Lake and Lewiston Reservoirs to provide suitably cold water for release to the Trinity River, as well as cold water resources for salmonids in the Sacramento Basin. Reservoir storage is maintained at levels that typically do not compromise the availability of cold water to meet Trinity River Basin temperature objectives. Trinity Lake storage of 1,000,000 acre-feet through the end of October typically provides adequate quantities of cold water while allowing for power generation at Trinity Dam. However, when storage is below roughly 750,000 acre-feet during the July- September period or below 1,000,000 af in October, Reclamation may have to use the lower most outlet, the auxiliary outlet, to discharge cold water, that forgoes power generation. During extremely dry conditions (e.g. multiple year drought), carryover storage as low as 400,000 acre-feet results in extensive use of the auxiliary bypasses to achieve suitably cold water.

TABLE 4
Target Storage of Trinity Lake.

Date	Storage (acre-feet)	Lake Surface Elevation (ft)
Nov 1 to Dec 31	1,850,000	2327
Jan 31	1,900,000	2334
Feb 28,29	2,000,000	2341
Mar 31	2,100,000	2348

1.10 Relationship to the Adaptive Environmental Assessment and Management Organization

An integral part of the new flow regimes for the Trinity River is the implementation of the AEAM organization. AEAM is an important process for management of complex physical

and biological systems such as the Trinity River. The AEAM organization uses a designated team of scientists that recommend changes to fishery restoration efforts and annual operating schedules in response to monitored effects of implemented actions and in order to ensure that restoration goals of the Trinity River are effectively met. Annual recommendations are approved by the TMC. Alterations in magnitude and/or duration of releases into the Trinity River (while maintaining annual instream release volumes for each water year type) are dependent on the information/management needs of the Trinity River program. Any substantial deviation from the currently recommended fishery flow regime would be done in accordance with all applicable laws. For more specific information concerning the AEAM organization, refer to the AEAM section of the Trinity River Final EIS/EIR.

2. Mechanical Rehabilitation

2.1 Mainstem Mechanical Rehabilitation Program

Mechanical rehabilitation activities including the construction of channel rehabilitation and side channel projects will occur along the mainstem Trinity River from Lewiston Dam to the North Fork Trinity River confluence. Mechanical rehabilitation sites will increase the amount of shallow, low velocity areas for salmonid fry rearing, increase habitat complexity, provide stable habitat for salmonid fry and juveniles over a wide range of flows, and allow the river dynamics necessary to maintain an alluvial system. The intent of channel rehabilitation is to selectively remove the fossilized riparian berm (berms that have been anchored by extensive woody vegetation root systems and consolidated sand deposits), provide restoration of the natural riparian vegetation and age structure, and recreate alternate point bars similar in form to those that existed prior to the construction of the TRD.

Channel rehabilitation is not intended to completely remove all riparian vegetation, but to remove vegetation at strategic locations to promote alluvial processes necessary for the restoration and maintenance of salmonid populations. Channel rehabilitation projects will also allow fluvial processes to affect areas that do not receive mechanical treatments. The tightly bound berm material is hard to mobilize even at high flows, thus requiring some mechanical berm removal. After selected berm removal, subsequent high-flow releases and coarse sediment augmentation will maintain these alternate point bars and create a new dynamic channel.

Specific channel rehabilitation recommendations vary by river segment between Lewiston Dam and the North Fork Trinity confluence because the needs of channel rehabilitation change with tributary inputs of flow and sediment. A total of 44 potential channel-rehabilitation sites and 3 potential side channel-rehabilitation sites have been identified in the proposed action. These potential sites are located where channel morphology, sediment supply, and high-flow hydraulics would encourage a dynamic, alluvial channel. Appropriate agreements with landowners must be obtained before any access or construction on private lands. Other factors such as property ownership, access to sites, cost and available funding will then be considered in the prioritization process.

Before any actual physical work can begin on these sites, additional environmental documents, building upon, and "tiering" from, the Final EIS/EIR, will first have to be prepared. Furthermore, additional federal approvals (NEPA, ESA, 404, etc), along with

approvals from Trinity County and the California Department of Fish and Game in some instances, will be necessary. A short implementation period for a significant number of these projects is recommended to quickly increase the quality and quantity of salmonid habitat. The remaining projects may then proceed following an evaluation of the interaction of the channel rehabilitation sites with the new flow regimes.

2.2 High Flow and Channel Rehabilitation Implementation

Although flows up to 11,000 ft^3/s will not likely occur before the completion of bridge and structure modifications, the construction of mechanical rehabilitation projects should begin as soon as possible. This will assure that some modifications will be in place that will allow the river to create additional habitat once high flows can be implemented. It is important to emphasize that projects should be constructed with the understanding that the higher flows as recommended for fishery restoration objectives will occur when floodplain structures have been modified to accept higher flows. Without increased flows, channel and habitat diversity will not be greatly improved at mechanical rehabilitation sites. High flows will help establish proper riparian function by maintaining a higher water table at critical times, sort and distribute coarse and fine sediment adding to substrate complexity, and provide nutrient dispersal across floodplains and within the channel by movement and deposition of wood and riparian debris. River flow is an integral component to restoring aquatic and floodplain habitats. High river flow will continue to be the primary reason for improvements to habitat at mechanical rehabilitation sites and the river as a whole.

2.3 Location and Implementation Plan

Twenty-four sites are proposed during the first three years of construction if adequate funding is available. Additional projects will be constructed after evaluation of the first series of projects under Adaptive Environmental Assessment and Management. This evaluation will be ongoing beginning with construction of the first projects, but an interim period without construction activities may be necessary to fully evaluate the effectiveness of project designs and the effect of the new flow regime before beginning construction on the remaining sites.

Locations of project sites will generally occur in areas of historic point bars, channel meander areas, and high flow channels. These sites were determined to be the most suitable areas when analyzed by aerial photos and during reconnaissance surveys in 1995. An additional field survey was conducted in late 1999 to determine if the original 47 proposed sites were still the most appropriate areas for projects. Most of the previously identified sites are still in need of mechanical rehabilitation; however, the morphology at some sites has changed and some sites appear to be more appropriate for more immediate construction than others.

To determine prioritization for construction, the Mainstem Restoration Subcommittee of the Trinity River Task Force has begun the development of biologic and geomorphic prioritization criteria. Potential benefits and the certainty of benefits for each project are evaluated based on several criteria. Each potential site will be evaluated by this process and given a score based on biological and geormorphic considerations. Appropriate agreements with landowners must be obtained before any access or construction on private lands. Other

factors such as property ownership, access to sites, cost and available funding will then be considered in the prioritization process.

Construction of past pilot projects was limited by permit requirements to summer months to reduce fishery impacts. The primary construction season for future projects will likely be similarly constrained. However, construction during other seasons should not be precluded. Construction of the majority of any individual project could occur during other seasons with limited environmental impacts. Removal of riparian vegetation during other seasons could occur and the site could be built to grade without impacting in channel habitat. Tributary accretion that increases mainstem flows may create turbidity from sand and fine sediment, but this would occur regardless of the time of year a project is constructed. If a project is built during summer months, the fine sediment that remains on a point bar will still be moved into the channel by the first high flows following construction. Winter construction may actually be advantageous in some situations because later season floods that occur in January or February for example, may transport sediment out of the system more effectively than earlier freshets that occur in October or November. There may also be additional advantages to construction during other seasons such as eliminating impacts to nesting songbirds, increased assimilative capacity for construction-generated turbidity, and decreased construction costs.

3. Coarse and Fine Sediment Management Program

3.1 Coarse Sediment Augmentation Program

A coarse sediment management program is needed to replenish substrate essential in creating abundant fish habitat and attaining a functional dynamic alluvial river system (McBain & Trush, 1997). Blocked by the dams of the TRD, coarse sediment supplies from Lewiston Dam to the confluence with Rush Creek have been reduced mainly to those quantities artificially supplied through a spawning gravel augmentation program. As a consequence the amount of gravel stored immediately downstream of Lewiston Dam is decreasing. The previous augmentation program that existed was not sufficient to achieve a necessary balance of coarse sediment supply. Increasing river flows to magnitudes greater than those that have occurred in the past will increase gravel transport capability and therefore will require an augmentation program.

3.1.1 Immediate Coarse Sediment Needs

Two sites require immediate coarse sediment augmentation for spawning purposes. A 1,500-foot reach immediately downstream of Lewiston Dam (River Mile (RM) 111.9) needs roughly 10,000 yd^3 of course material (5/16 to 5 inch). A 750 foot reach immediately upstream of the USGS cableway at Lewiston (RM 110.2) requires roughly 6,000 yd^3 of course material (5/16 to 5 inch).

Coarse sediment sources are available in the immediate area and will be used for initial augmentation. Sources include dredge tailing downstream from Lewiston at RM 108.5, RM 106.3, and other locations. Dredge tailings are to be screened and substrate ranging from 5/16 inch to 5 inches will be placed at designated sites. Subsequent environmental review and permitting might be necessary to develop new sources of coarse sediment unless local

private mining operations in full compliance with environmental permitting requirements can meet the anticipated demand.

3.1.2 Future Coarse Sediment Augmentation

Increasing river flow through implementation of the Preferred Alternative will result in increased transport of coarse sediment through the river. Increased transport of coarse sediment from the upper river will require coarse sediment augmentation in most years. As part of the AEAM process, empirical data and model results will be used each year to identify the level of augmentation needed to balance the coarse sediment supply for the area between Lewiston Dam and Rush Creek. Estimates of the quantities needed for each year type are provided in **Error! Reference source not found.**. Coarse sediment placement will include use of heavy machinery to place gravels at desired sites during low flow conditions and also introductions during peak spring flows. The latter method entails placing the coarse sediment into the river at RM 110.9 where water velocity and hydraulic energy is sufficiently high allowing for fluvial dispersion.

Sources for the augmentation program include those sites that are to be used for immediate needs as well as other mine tailings located upstream and downstream of Lewiston. Coarse sediment at dredge tailings will be screened to eliminate fine sediment while providing spawning gravel that ranges from 5/16 inch to 5 inches.

TABLE 5
Estimates of Annual Coarse Sediment Augmentation.

Water Year Class	Cubic Yards per Year[a]
Extremely Wet	49,100
Wet	14,200
Normal	2,000
Dry	200
Critically Dry	0

[a]Actual volumes could vary by +/- 50 percent or greater. The AEAM process will monitor and test these hypotheses and recommend augmentation volumes on an annual basis based upon the results of previous years augmentation and modeling.

3.2 Fine Sediment Control: Dredging of Grass Valley Creek Sediment Collection Pools (Hamilton Ponds)

Hamilton Ponds in Grass Valley Creek periodically fill with decomposed granitic material due to historic logging practices and the highly erosive nature of the soils in the watershed. Without the periodic dredging, sediment would enter into the Trinity River and negatively impact salmonid spawning and rearing habitat. The dredging project is a continuation of from years past and involves periodically dredging roughly 42,000 yds^3 of mostly sand, and some gravel and cobble, from the three sediment collection basins (ponds) located just upstream from the confluence with the Trinity River. Dredging occurs when the ponds become full, that does not occur annually. Material will be dredged using an excavator. Loaded ten-yard dump trucks will haul the material to a designated spoils area located on site or offsite outside the creek's flood plain (see Negative Declaration and Initial Study, Trinity River Pool and riffle Construction for Fishery Restoration, April, 1985, State clearinghouse #84022805). The spoils area will be prepared by stripping and stockpiling

topsoil for use on the top of the newly deposited spoils. This will occur for revegetative purposes. Dredging will typically be conducted between July 1 and October 15 of the year in which the ponds fill. The ponds often fill during a single storm and runoff, especially in wet and extremely wet water years, losing trap efficiency. Dredging should occur whenever the ponds fill, preserving trap efficiency. Winter dredging should be investigated because this would prevent the ponds from filling and subsequently discharging sediment into the Trinity River during the winter and spring.

4. Infrastructure Modifications—Locations/Sites and Implementation Plan

Increasing releases from 6,000 to 11,000 ft^3/s for Trinity River restoration purposes may impact four bridges and will inundate private properties downstream to a minimal extent in most cases to almost total inundation for a limited number of parcels. From Lewiston Dam to the confluence with Rush Creek (~5 miles), releases of 11,000 ft^3/s exceed the current 100-year Federal Emergency Management Agency (FEMA) flood event of 8,500 ft^3/s, that is based upon a 1976 Flood Study by the Army Corps of Engineers (USCOE, 1976). Downstream of Rush Creek, 11,000 ft^3/s would result in river flow less than the 100-year event as designated by FEMA. FEMA requires that any replacement bridge not increase the risk of damage to existing structures nor increase the Base Flood Elevation (most probable 100 year flood) more than one foot.

4.1 Bridge Replacement (site descriptions cited *from* Omni-Means, LTD, 2000)

Four bridges in Trinity County (Salt Flat, Bucktail, Poker Bar, and "Treadwell" on Steelbridge Road) will be replaced in order to accommodate 11,000 ft^3/s releases and associated tributary accretion in May. None of these bridges meets currently recommended design standards for water conveyance and debris clearance at the maximum prescribed flows, and the foundations of each appear to be inadequate to withstand the scouring action of the maximum prescribed flows.

The existing Salt Flat Bridge on Salt Flat Road, off of Goose Ranch Road west of Lewiston at River Mile 107, is a privately owned structure serving 27 parcels. The bridge is a single lane, 270-foot-long structure, 10-foot-wide, four-span railway car bridge. The river channel at this site is split at low flow. The left arm is a side channel constructed by USBR for fish spawning and habitat purposes.

The existing bridge at Bucktail on Browns Mountain Road, located about 0.25 miles northeast of Lewiston Road at River Mile 105, is a single span, 76-foot-long, 32 foot-wide , steel girder structure with pile-supported concrete abutments that is county owned, and services about 60 parcels. The replacement of Bucktail bridge includes a significant local channel improvement to accommodate a bridge of acceptable capacity. The required channel improvement consists of removal and grading of a portion of the right floodplain to accommodate the longer length required in a new bridge. The excavation will extend roughly 600-feet upstream and 150-feet downstream of the existing structure.

The existing bridge at Poker Bar on Bridge Road, is located 1.5 miles from State Highway 299, about halfway between the towns of Lewiston and Douglas City at River Mile 102. The

bridge consists of two privately owned, single-span, railway car structures crossing two main channels (left and right) of the Trinity River that serve 77 parcels. The structure over the right channel is 87-foot-long, 18-foot-wide, and constructed with twin side-by-side railway cars. The car beams are supported on four steel "H"-piles at each abutment. The existing structure over the left channel is 52-foot-long, 20-foot-wide and is also constructed with two side-by-side railroad cars supported on steel "H" piles at each abutment. A concrete retaining wall and two concrete filled, riveted steel caissons are present in front of each of the abutments.

The existing Treadwell Bridge is located off Steelbridge Road about 3 miles upstream (east) of Douglas City. It is a privately owned, single-lane bridge and serves 9 parcels. The structure is a four-span, 201-foot-long, 12-foot wide, railway car bridge supported on concrete piers and abutments. Foundation type is unknown at both abutments and at each of the piers. The right abutment is established in fill encroaching on the river flood plain. The left abutment is established in the bank along the left edge of the channel. Prior to initiating any pre-construction activities bridge owners would be contacted and rights of entry negotiated. Transfer stipulations after construction including required operation and maintenance must also be addressed.

Pre-construction efforts will include procurement of design services, permitting , surveys, design and geotechnical investigations (USBR, 2000). The initial project (first year) will be to perform exploratory drilling at the anticipated bridge pier locations to determine depth to bedrock. Actual construction would occur in the second year. Total project time ranges from 17 to 28 months and depends on the construction window (the period of time equipment is allowed to work within the Trinity River wetted perimeter due to biological constraints). Assuming a time range of 17 to 28 months, projects that begin in summer 2000 (in pre-construction phase) would be completed by late 2001 to late 2002.

The construction window is roughly July 1 –September 15 of each year. In general, the following measures will be followed to reduce any potential impacts through the operation of heavy equipment:

- All sites will be surveyed for rearing coho in the immediate project area. Surveys for nesting owls and eagles will occur within a 0.5 mile radius of the project site prior to beginning work activities. The presence of coho will be determined by direct observation, beach seines or Electro-fishing. If a spotted owl or bald eagle nest site is located, scheduled work activities will be delayed (through July 10 for owls and August 31 for eagles) and/or an alternate site will be selected and surveyed. Alternatively, NMFS will be consulted with to address any impacts to listed species.
- Heavy equipment operation will be conducted between July 1 and September 15.
- All mechanical equipment used shall be free of grease, oil, or other external petroleum products or lubricants. Equipment shall be thoroughly checked for leaks and any necessary repairs shall be completed prior to commencing work activities.
- No herbicides or pesticides shall be used.
- All possible measures will be taken to minimize any increased sedimentation/turbidity in the mainstem from mechanical disturbance, such as leaving a small berm at the edge

of the channel to trap any sediments until all other work is completed. Turbidity and other water quality standards as identified in the "Water Quality Control Plan for the North Coast Region" and the Hoopa Valley Tribe Water Quality Control Plan will be monitored and maintained. If standards are not met, construction activities will cease until operations or alternatives can be done within compliance.

4.2 Structure Relocations

Structures at risk include at least one home, a number of mobile homes and trailers, various outbuildings and portions of access roads. Other improvements such as campgrounds, satellite dishes, garden and animal enclosures, mining operations and water systems would also be affected (USBR, 2000). Recognizing that implementation of the flows identified in the Preferred Alternative may affect these properties, mitigation measures may be appropriate and will be determined on a case by case basis. Affected land owners will be contacted, and right-of-entry and property modifications agreements negotiated to allow control surveys of structures.

The amount of time for home and structure relocation from initial identification and surveys to final actions is expected to be 18 months. Projects that begin in summer 2000 with structure identification and landowner contacts should be completed by summer 2001 to early 2002.

The limiting factor for initiation of high flows over 6,000 ft^3/s will therefore be construction of new bridges. If bridges are constructed by late 2001, flow increases above 6,000 ft^3/s would be allowable by spring 2002. Flows up to 6,000 ft^3/s could occur before houses and structures are relocated and before bridge construction is complete. It may be possible to release up to 8,500 ft^3/s prior to replacement of the Bucktail and Poker Bar bridges, if planned foundation investigations indicate that these bridges would not be damaged by the scouring action of flows of this magnitude. However, replacement/modification of all four bridges is necessary for safe implementation of Lewiston Dam releases of 11,000 $ft^3/s/s$ in an extremely wet year.

5. Watershed Protection Program

5.1 Watershed Protection

Roughly 80 percent of the lands within the Trinity River basin are federally managed. Of the remaining 20 percent of the Trinity River basin that is privately owned, roughly half (10 percent of the total) are industrial timberlands, with the remainder being small private holdings. The majority of industrial timberlands within Trinity County are owned by Sierra Pacific Industries (SPI). SPI does not permit access to their lands for non-employees for watershed inventories, stream inventories or publicly funded restoration projects. Therefore, the majority of work is likely to occur on federal lands within the basin in the near future, although county and non-industrial private roads require substantial improvements as well. In addition, other industrial timberland owners such as Simpson and Timber Products do participate in restoration projects.

To date, Trinity River Restoration Program (TRRP) funds expended on watershed restoration activities have largely gone to the Trinity County Resource Conservation District

(TCRCD), the U.S. Forest Service and the USDA - Natural Resources Conservation Service (NRCS) and Yurok Tribe. The relatively stable workload enables NRCS to maintain a field office and engineer in Weaverville. TCRCD and NRCS and Yurok Tribe have successfully leveraged funds from the TRRP to obtain outside grant funding for watershed restoration throughout the Trinity River basin.

The Northwest Forest Plan applies to BLM and Forest Service lands and requires extensive road rehabilitation and road decommissioning projects as described in the Aquatic Conservation Strategy (ACS). The Forest Service budget provides for maintenance of only 20 percent of its total road mileage, with an accumulated backlog of $8 billion (U.S. Forest Service Chief Michael Dombeck, 1999) Road maintenance budget shortfalls for National Forest lands in the Trinity River basin are comparable. The Forest Service budget has not yet been adequately supplemented with road maintenance funding since the rapid decrease in timber sale revenues during the 1990's. The South Fork Trinity River and mainstem Trinity River (above and below Trinity and Lewiston Dams) are listed under Section 303d of the Clean Water Act as waterbodies impaired by sediment. The U.S. Environmental Protection Agency (USEPA) has completed a Total Maximum Daily Load (TMDL) for sediment in the South Fork Trinity River watershed. However, an implementation plan has not yet been approved by the North Coast Regional Water Quality Control Board (NCRWQCB). A TMDL for the mainstem Trinity River for sediment is scheduled for completion by USEPA in December, 2001.

The Forest Service, USEPA and the NCRWQCB are in the process of coordinating a "Northern Province TMDL Implementation Strategy for Forest Service Lands" (January, 2000). The Hoopa Valley Tribe is in the process of finalizing a Water Quality Control plan. The Shasta-Trinity National Forest (STNF) has yet to complete the necessary watershed analyses, Access and Travel Management Plans, NEPA documentation and funding for large-scale on-the-ground restoration activities pursuant to the Northwest Forest Plan and TMDL's to address sediment problems on National Forest lands. Conversely, the Six Rivers National Forest (SRNF) has made significant progress in completion of its Watershed Analyses, Access and Travel Management Plans, NEPA documentation and obtaining funding sources (including State funds) to complete the necessary road rehabilitation and decommissioning projects.

Roughly 600 miles of County roads within the Trinity River basin are maintained by Trinity and Humboldt counties, that are part of the "Five Counties Coho Conservation Program." The Five Counties Program includes Trinity, Humboldt, Del Norte, Siskiyou and Mendocino counties. State funding through the Proposition 204 Delta Tributary Watershed Program has been obtained to inventory and mitigate erosion and fish migration barrier problems associated with county roads within the Trinity River basin. Roughly $360,000 of the funding designated for California from the Pacific Coast Salmon Restoration Initiative will go toward county road improvement projects in the Trinity River basin. Depending on the county road inventory results, there could be a substantial need for additional funding to implement road-crossing problems on county roads. In particular, many culverts will likely need replacement with expensive bridges or natural-bottom culverts. One noteworthy distinction for county roads is that they must be usable year-round to serve residents, whereas other road systems are often seasonally utilized. The ongoing decline in Forest Reserve Fund payments to counties from reduced timber harvest activities has negatively

impacted the abilities of Humboldt and Trinity counties to adequately maintain, repair, and upgrade their road systems.

5.2 Description of Watershed Protection Work Activities

Road maintenance involves grading, rocking and clearance of drainage structures on existing roads to ensure that a minimum amount of erosion occurs. The current level of inadequate funding for road maintenance activities increases the risk of catastrophic failure of road fills when culverts and other drainage structures become plugged.

Road rehabilitation involves the upgrade of existing road systems, that have been determined to be necessary for long-term management purposes such as residential access, logging, recreation, fire protection, etc. Work consists of replacing undersized culverts with new culverts or bridges capable of accommodating a 100-year storm, associated debris, as well as fish passage in anadromous streams. Outsloping, rocking of roads, energy dissipaters, and the addition of new drainage structures to reduce the accumulation of water in inboard ditches are accepted methods of reducing erosion from road systems.

Road decommissioning is the removal of stream crossing structures, culverts, "Humboldt Crossings," and sometimes reshaping, ripping, seeding and mulching of the road surface, depending on slope, soil type and other conditions.

Grass Valley Creek Revegetation Program is the result of nearly 2 decades of investigations and restoration of the Grass Valley Creek watershed. The Trinity County Resource Conservation District is planting various native species to stabilize the highly erosive decomposed granite soils.

South Fork Trinity River Coordinated Resources Management Program (SF CRMP) is an ongoing cooperative watershed restoration effort . Efforts include road rehabilitation, road decommissioning, riparian improvements, water conservation and fish passage.

Lower Klamath Watershed Restoration is an ongoing cooperative effort between the Yurok Tribe, Simpson Timber, the State of California, with some funding provided by the Trinity River Restoration Program. Work consists primarily of road decommissioning and road rehabilitation. Public Law 104-143 extended the scope of funding authority under the Trinity River Restoration Program to the lower Klamath River between Weitchpec and the Pacific Ocean.

5.3 Prioritization of the Work/Implementation Plan

Watershed restoration priorities must address the physical, biological and legal issues associated with the Trinity River. The following criteria are recommended:

1. Tributary watersheds located between the North Fork Trinity confluence and Lewiston Dam shall be the highest priority.
2. Key watersheds designated pursuant to the Northwest Forest Plan
3. Refugia stream reaches noted for accommodating wild stocks of salmon and steelhead and/or listed species pursuant to/under the Endangered Species Act.

4. Roaded stream crossings at risk of catastrophic failure or migration barriers for anadromous fish.
5. Lands that are available for restoration because of landowner permission and/or completion of environmental compliance and permitting (Watershed Analysis, NEPA/CEQA/CWA 404, 401, etc.).
6. Projects that provide a cost share from the landowner/agency or other funding sources.
7. Sub-watersheds identified as priorities through the TMDL, as well as State and Tribal Water Quality Control Plan processes and monitoring programs.
8. Projects that allow continued collaboration through the restoration infrastructure of TCRCD and NRCS.

A significant decrease in the road mileage of the Trinity River Basin, in combination with the upgrade of integral roads, will shrink the size of the required overall road maintenance budgets.

5.4 Funding Sources

Watershed Restoration work in the Trinity River basin is currently funded through a variety of sources. Trinity River Restoration Program appropriations to the Bureau of Reclamation through the Energy and Water Development Appropriation Acts have historically been the single largest funding source in the Trinity River Basin restoration activities. Restoration of Grass Valley Creek, the South Fork Trinity River Coordinated Resource Management Plan (CRMP) Program and other activities have been extensively funded for many years by Reclamation to the TCRCD, NRCS and others. However, federal budgets have been cut and funding needs for restoration of the mainstem Trinity River fishery will increase through implementation of this ROD.

In recent years, Trinity County, the Trinity County Resource Conservation District, Six Rivers National Forest and others have obtained funding from other sources for supporting programs. The following is a brief list and description of potential funding sources available for watershed restoration in the Trinity River basin:

- S.B. 271 (California Salmon and Steelhead Restoration Account) This program is funded by the State of California through Tideland Lease revenues and the General Fund. A maximum of $8 million/year will be available through this for allocation through 2005, with three additional years to implement funded projects. This program places a high priority on watershed assessment and upslope watershed restoration activities. Over a million dollars of this funding has been allocated to projects in the Klamath-Trinity basins in 1997-99. Matching funds are encouraged, but not required.
- Clean Water Act Section 205j and 319h- these funds are available through the State Water Resources Control Board for water quality planning/monitoring and non-point source reduction, respectively. Significant non-federal matches are required, and contracting procedures are detailed and time-consuming. Historically, little funding has been made available to Trinity River basin projects through these programs because other funding is available in the Trinity River basin, that is not available elsewhere in the State.

- Pacific Salmon Restoration Initiative- Roughly $9 million was made available in FY 2000 through the Department of Commerce budget (NOAA/NMFS). Trinity and Humboldt counties intend to spend the funds on highest priority projects, that pose both erosion problems and fish passage barriers. Significant non-federal matches are required.
- USFS and BLM appropriated funds for land and watershed management.
- County road funds- in some cases, these funds may be available as a non-federal match for other funding sources, especially if an existing county road would otherwise require some sort of maintenance or improvements.
- Jobs in the Woods- In recent years, BLM has been dedicating a portion of its funds in this category for restoration and sediment reduction work in the Grass Valley Creek Watershed, primarily through the TCRCD. Additionally, the TCRCD has applied for and received USFWS Jobs in the Woods funds to implement watershed restoration throughout the Trinity River Basin.
- CVPIA Restoration Fund – An Interior Solicitor's Opinion states that these funds, appropriated by Congress from fees charged to CVP water and power users, could be used to implement this ROD. This could include watershed protection and restoration activities.
- Proposition 13 – In March, 2000, the voters of California approved a multi-million dollar bond act that can be used for fishery and watershed restoration activities that are part of this implementation program. The State of California intends to use these funds to provide the non-federal match for the Pacific Salmon Restoration Initiative.

6. Adaptive Environmental Assessment and Management

Alluvial river systems are complex and dynamic. Our understanding of these systems and our ability to predict future conditions are continually improving. Adaptive Environmental Assessment and Management (AEAM) gives decision makers the ability to refine previous decisions in light of the continual increase in our knowledge and understanding of the river and catchment.

The AEAM approach to management relies on teams of scientists, managers, and policy makers jointly identifying and bounding management problems in quantifiable terms (Holling, 1978; Walters, 1986). In addition, the adaptive approach "to management recognizes that the information on which we base our decisions is almost always incomplete" (Lestelle et al., 1996). This recognition encourages managers to utilize management actions to increase our knowledge of complex systems, that, in turn, results in better future decisions. AEAM need not only monitor changes in the ecosystem, but also develop and test hypotheses of the causes of those changes, in order to promote desired changes. The result is informed decisions and increasing certainty within the management process.

AEAM is a formal, systematic, and rigorous process of learning from the outcomes of management actions, accommodating change, and improving management (Holling, 1978). Traditional approaches to management of rivers are inadequate to preserve biotic community diversity evidenced by single species management, complexity of species

interactions and interrelationships, and limited scientific knowledge about the interactions of abiotic and biotic factors. The concept of ecosystem management is not new; its implementation in regulated rivers is. It is important to stress not just flow recommendations and non-flow channel alterations but also the implementation of a new paradigm of river management built on the two-decade-old concept of Adaptive Environmental Assessment and Management [see also Hilborn and Walters (1992)].

An AEAM organization combines assessment and management. Most agency and task force structures do not allow both to go on simultaneously (International Institute for Applied Systems Analysis, 1979). The basis of adaptive environmental assessment and management is the need to apply lessons learned from past experience, data analysis and fine-tuning project implementation. AEAM combines experience with operational flexibility to respond to future monitoring and research findings and varying resource and environmental conditions. AEAM uses conceptual and numerical models and the scientific method to develop and test management choices. Decision makers use the results of the AEAM process to manage environments characterized by complexity, shifting conditions, and uncertainty about key system component relationships (Haley, 1990; McLain and Lee, 1996).

Effective management strategies must have explicit and measurable outcomes. There are few clear-cut answers to complex population biology, hydraulic, channel structure, and water quality changes. The AEAM process allows managers to adjust management practices (such as reservoir operations) and integrate information relating to the riverine habitats and the system response as new information becomes available.

A well-designed AEAM organization: (1) defines goals and objectives in measurable terms; (2) develops hypotheses, builds models, compares alternatives, designs system manipulations and monitoring programs for promising alternatives; (3) proposes modifications to operations that protect, conserve and enhance the resource; (4) implements monitoring and research programs to examine how selected management actions meet resource management objectives; and (5) uses the results of steps 1-4 to further refine ecosystem management to meet the stated objectives. The intention of the AEAM organization is to provide a process for cooperative integration of water control operations, resource protection, monitoring, management, and research.

The concept of restoring the natural hydrograph pattern discussed by Poff et al. (1997) is still debated, especially the role of hydrologic variability in sustaining the ecological integrity of river ecosystems. Stanford et al. (1996) also discuss ecological integrity. An adaptive management approach to increase our knowledge and management ability should be accompanied by physical process modeling and an evaluation program to monitor the physical and biological responses. Physical and biological processes will be modeled to facilitate the AEAM approach to restoring the unique fish fauna by designing a program for rehabilitating the river channels to provide habitats much improved over existing conditions. Such a program, similar to the recommendations by Ligon et al. (1995), needs to be supported by a rigorous prediction, monitoring and model validation program. The creation of an interdisciplinary team of scientists that run simulations, design and carry out monitoring programs, and offer recommendations to management is critical to successful implementation of the AEAM philosophy.

To adequately manage river systems for multiple use and conserve the biotic resources, on going monitoring of flow, sediment, geomorphic, and biological status is essential. With such data and the use of simulation models, river systems can be adaptively managed. Such informed decision-making, utilizing water supply forecasting and predictions of system response, is within the state-of-the art. Establishment of an AEAM organization will create a focused interdisciplinary effort involving physical and biological scientists. Peer review of all analyses, project design, and monitoring are essential to establish and maintain scientific and public credibility.

7. Organizing to Implement the Trinity River Restoration Program

The purpose of the Trinity River Restoration Program is to restore the basin's fish and wildlife populations to those that existed prior to construction of the TRD and to implement measures to restore fish and wildlife habitat in the Trinity River. An AEAM organization will implement the restoration program. The purpose of the Trinity River AEAM organization is two-fold. First, the AEAM organization will design and direct monitoring and restoration activities in the Trinity River basin. Second, the AEAM organization will provide recommendations for the flow modifications for the OCAP of the Trinity River Division (TRD) of the Central Valley Project, if necessary. The Rehabilitation Implementation Group will coordinate the federal fisheries restoration effort in the Trinity River watershed. For more information on specific biological and geomorphic objectives, and on the initial working scientific hypotheses of the preferred alternative, please refer to the TRFE, pp. 278-289.

Implementing the Trinity River AEAM organization requires a collaborative and cooperative approach among government agencies, tribes, landowners, and stakeholders. The Implementation Plan establishes a Trinity Management Council (TMC) that is responsible for organization oversight and direction. A Trinity Adaptive Management Working Group (TAMWG) provides policy and technical input (Technical Advisory Committees) on behalf of Trinity basin stakeholders to the TMC. Figure 1 shows the AEAM organization structure. The focus of the AEAM organization is the Trinity Management Council and an AEAM Team consisting of a Technical Modeling and Analysis Group (TMAG) and a Rehabilitation Implementation Group (RIG). The organization includes a support staff (AEAM Team) of engineers and scientists charged with assessing the Trinity River fishery restoration progress. The AEAM Team may recommend management changes based on annual assessments of the evaluation of rehabilitation and flow schedule activities. The AEAM Team coordinates independent scientific reviews of the AEAM organization. The AEAM Team works closely with the resource management agencies that are responsible for implementing specific Trinity River restoration program activities. For instance, the USDA Forest Service or BLM may carry out a channel rehabilitation project on their lands. They would do so in collaboration with the AEAM Team.

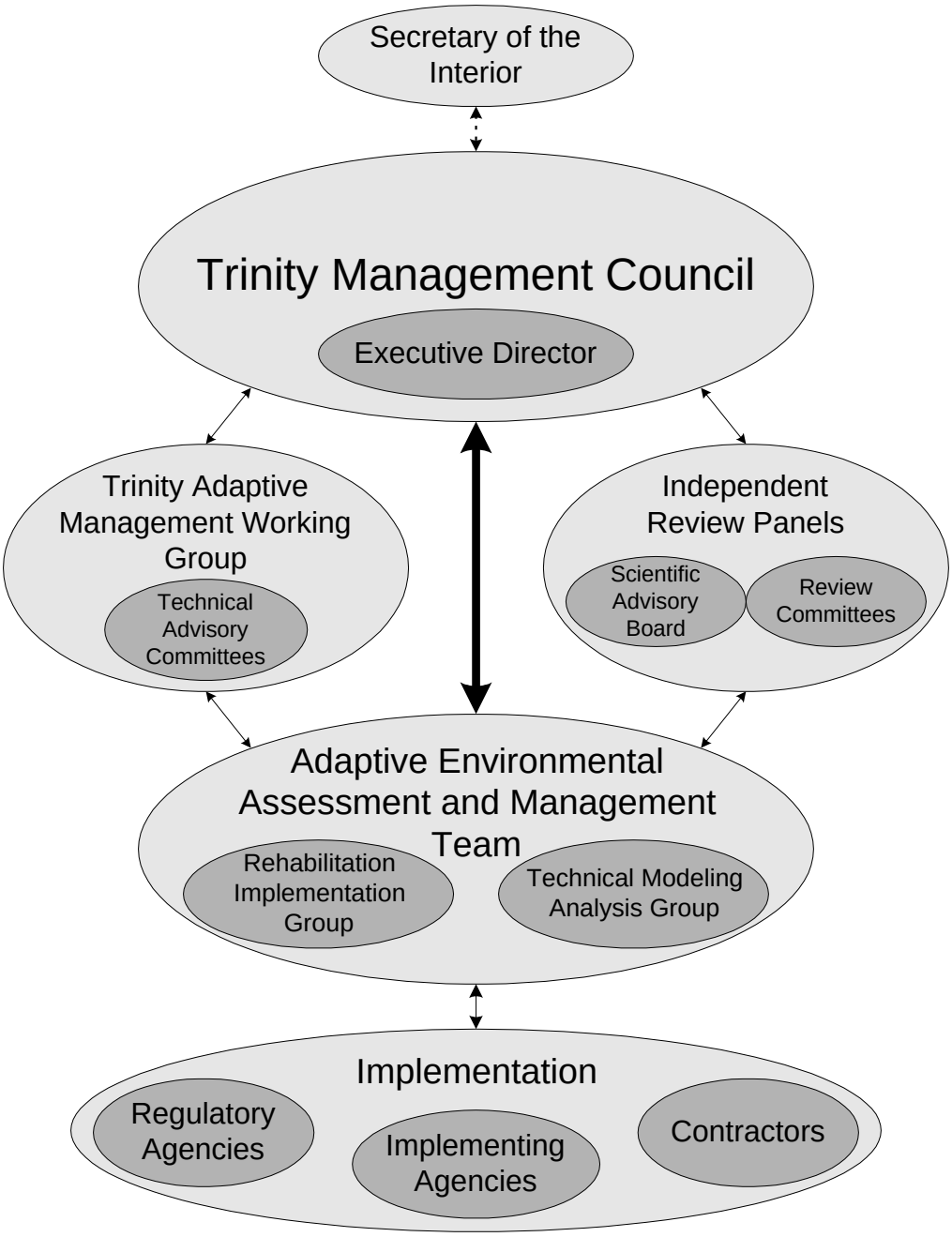

Figure 1 Trinity River Adaptive Environmental Assessment and Management organization structure.

The AEAM organization will be funded primarily by the U.S. Department of the Interior. The Trinity Management Council (TMC) and Executive Director will be the decision-making body for the organization, operating as a board of directors and advising the Secretary of the Interior. Within the overall AEAM organization structure are Stakeholder Groups, Independent Review Panels, Regulatory Agencies, and the Adaptive Environmental Assessment and Management Team.

The membership and staff specifications presented herein should be considered flexible as funding changes and the organizational scope matures. The AEAM organization staff should be stationed in a single location in northern California. The office should be in close proximity to the Trinity River Division (TRD) with reasonable travel accessibility for visiting managers and scientists.

Implementation of the TREIS/R preferred alternative will be managed by the Trinity Management Council, and Executive Director, and carried out through individual agencies (state, federal, and local) and tribes acting within their existing authorities as well as through contracts awarded through a competitive process. Implementation by federal and state agencies is subject to annual appropriations.

All agencies will retain their existing authorities. However, when the TMC recommends a particular project or program, agencies will be expected to undertake those projects. If agencies do not implement the recommended actions or projects, they must explain to the TMC in writing why they have not done so.

7.1 AEAM Organization

The following sections describe the AEAM organization and each element of the structure including:

- Membership
- Roles & Responsibilities
- Staff

Finally, an example of assessment and monitoring based on the scheduling of the peak flow release during an extremely wet water-year follows the description of the organization elements.

7.1.1 Trinity Management Council (TMC)

Membership

Part-time designees from the following organizations:
US Fish & Wildlife Service (Service)
US Bureau of Reclamation (Reclamation)
US Forest Service
Hoopa Valley Tribe (HVT)
Yurok Tribe (YT)
State of California (designee from Secretary of Resources)
Trinity County
NOAA National Marine Fisheries Service

A Chairperson (Federal Agency) selected from the membership

Roles & Responsibilities

Has decision making authority for their agency/organization
Interprets and recommends policy, stays out of day-to-day operations, similar to board of directors
Coordinates and reviews management actions
Provides organizational budget oversight

When necessary elevates unresolved conflicts within the council to the Secretary
Conducts search for and selects a nominee for Executive Director (actual hiring conducted within appropriate agency's personnel rules and regulations)
Reviews personnel actions by Executive Director
Authorizes and approves Requests-For-Proposals (RFP's) to be developed by Technical Modeling and Analysis Group
Ensures policy level consideration of issues submitted through Executive Director by regulatory agencies, stakeholder, and other management groups
Coordinates with other management groups and actions through the Executive Director
Considers proposed modifications of the annual flow schedule
Hires and supervises the Executive Director through a lead Interior agency as determined by the Secretary

Staff

Federal, Tribal, State, and local governing agencies – Existing staff
Staff 1/10th-time
Travel and Incidental Expenses

Executive Director

Executes policy and management decisions of the Trinity Management Council
Is the focus for all and oversees all activities of the Trinity River AEAM Organization. Coordinates with agencies implementing specific program elements

Membership

Full-time Executive Director
Full-time Administrative Assistant

Roles & Responsibilities

Hired and supervised by a lead Interior agency as determined by the Secretary
Coordinates execution of all TMC decisions through the Adaptive Environmental and Assessment Management Team
Hires Administrative Assistant and AEAM Team members subject to TMC authority
Acts as point of contact for public relations
Supervises the Adaptive Environmental Assessment and Management Team and coordinates the Independent Review Panels (including the Scientific Advisory Board (SAB)) the TMC, Stakeholder Groups, and Regulatory Agencies.
Coordinates flow schedule and rehabilitation activities with other operational agencies
Schedules and conducts information exchange workshops with stakeholders & regulatory agencies
Submits annual flow schedule to TMC for review and approval
Submits annual budget to TMC for review and approval
Monitors budget expenditures
Secures necessary permits for all program activities
Reports progress towards restoration goals to TMC, Stakeholders, Regulatory Agencies, and the public

Staff

2 Full Time Equivalent (FTE) employees

7.1.2 Trinity Adaptive Management Working Group (TAMWG)

The Trinity Adaptive Management Working (TAMWG) group consists primarily of representatives of stakeholders, with participation from tribes, state, local, and federal agencies on the TMC with a legitimate intent to restoration of the Trinity River. The purpose of the TAMWG is to assure thoughtful involvement in the Trinity River restoration program, particularly the adaptive management process. TAMWG provides an opportunity for stakeholders to give policy and management input about restoration efforts to the TMC. TAMWG will be formally organized, including technical committees. The TAMWG may be chartered under the Federal Advisory Committee Act (FACA). TAMWG will hold at least two meetings per year of the full group, involving the public. The technical advisory committees may hold additional meetings with the TMAG to discuss technical issues, review annual flow schedules, and RFP's for implementation activities.

Stakeholders will have an opportunity to submit alternative hypotheses and/or alternative restoration actions to the TMC for consideration in their capacity as an advisory group. The TMC will seek review of alternatives proposed by the Technical Modeling and Analysis Group (TMAG) and the Rehabilitation Implementation Group (RIG) (see discussions of TMAG and RIG).

Membership

Members of TAMWG should be senior representatives of their respective constituent groups with a legitimate link to restoration activities on the Trinity River. They should have authority to speak on behalf of their organization(s) and commit to following up TAMWG and TMC discussions with their colleagues. If the Secretary charters TAMWG under FACA, minimum membership qualifications should include at least the following:

Individuals are senior representatives of their organization(s) authorized to speak on their behalf and, where appropriate, commit funds.
Individuals should have extensive knowledge of the Trinity River Restoration Program and the Trinity Adaptive Management Organization.
Members should elect a strong and fair chairperson that recognizes when discussions stray.
Technical committee participants must have appropriate technical qualifications to engage in technical discussions.
TAMWG members should expect to commit at least 10 percent of their time to this effort.
Members of TAMWG technical committees should expect to commit at least 25 percent of their time to this effort.
TAMWG should/will replace representatives on the Working Group or technical committees that do not actively participate or attend meetings.

May include representatives from these and other interests:

- Recreation
- Environment
- Landowners
- Commercial fishing
- Sport fishing
- Timber
- Power
- Agriculture

- Water users
- Agencies
- Others

Roles & Responsibilities

Provide policy and management recommendations on all aspects of the program to TMC via Executive Director

Develop and submit alternative hypotheses for consideration by TMC and potential analysis by TMAG and RIG

Recommend management actions and studies for RFP development and implementation

Staff

Provided by each stakeholder group

7.1.3 Adaptive Environmental Assessment and Management Team

This team provides expert support to the TMC as relates to both scientific evaluation of restoration progress and managements implementation. However, the team expertise is subdivided into staff focusing their efforts toward either management implementation or analyses and scientific assessment. The AEAM Team office should be in close proximity to the Trinity River Division (TRD) with reasonable travel accessibility for visiting managers and scientists.

7.1.3.1 Technical Modeling and Analysis Group (TMAG)

Interdisciplinary group of scientists, engineers, and technical specialists, responsible for conducting and managing complex technical studies and projects, and integrating the products of those studies and projects into management objectives and recommendations. Supervised by the Team Leader under the Executive Director. The TMAG conducts technical analyses, model projections for achieving restoration objectives, design for comparison with ongoing approaches, planning, peer review, and budgeting. The TMAG makes recommendations to the TMC through the Executive Director for implementation and testing of appropriate hypotheses. The TMAG recommends modifications to the annual flow schedule within the annual water year-type allocation. The TMAG oversees scientific evaluation and design of all rehabilitation projects including: bank rehabilitation, gravel augmentation, riparian re-vegetation, floodplain creation, sediment management, and watershed rehabilitation. The TMAG develops the scope of work for these actions. The TMAG serves as the Contracting Officer's Technical Representative (COTR). The TMAG shares some COTR responsibilities to the RIG.

Membership

Full-time Group Leader Interdisciplinary experience in water resources management or river restoration/rehabilitation with expertise in biological and geomorphological sciences. Supervised by the Executive Director.

Four full-time, multi-disciplinary scientists/engineers representing these disciplines:

- Fisheries Biology
- Fluvial Geomorphology/Hydraulic Engineering
- Riparian Ecology/Wildlife Ecology
- Water Quality/Temperature

- Hill Slope Geomorphology/Watershed Hydrology
- Information Management/Computer Modeling

A part-time representative from USBR Operations (CVP) serves as a member of this team when formulating the annual flow schedule.

Roles & Responsibilities

Team members collaborate in:

- Habitat modeling and mapping, SALMOD, habitat quality (gravel quality), statistics, population modeling
- Sediment transport, channel response, channel design
- Riparian revegetation, regeneration, and encroachment and removal
- Water temperature and other water quality indicator modeling
- Information Management and GIS
- Flow release recommendations and annual flow schedule formulation
- Integration of appropriate models for describing the response of the stream corridor to management alternatives
- Watershed restoration

Evaluates previous year & historical monitoring results with respect to existing hypotheses
Re-visits scientific hypotheses as appropriate
Conducts sediment transport modeling, habitat modeling, temperature modeling and salmon production modeling
Integrates multidisciplinary information and identifies alternatives to resolve conflicting ecological management needs
Coordinates with operations and presents analyses to TMC for resolving conflicts and assessing management needs
Provides short term research project development and oversight
Conducts long-term trend monitoring development and oversight
Sets standards and protocols for monitoring information (datum, coordinate systems, reporting techniques and formats, etc)
Ensures effective data management, storage, analysis, and distribution
Solicits technical input review from stakeholder groups and regulatory agencies
Analyzes and submits implementation plans for scientific peer review
Coordinates review from Scientific Advisory Board and Review Committees
Submits designs in collaboration with the RIG for Rehabilitation Activities and Objective Specific Monitoring
Is responsible for RFP development and preparation of statements of work in cooperation with the RIG Contracting Officer
Contracting Officer's Technical Representative - assist in Objective Specific Monitoring and Rehabilitation Activities contracting
Provides program reporting
Completes special duties as requested by Executive Director

Staff

Six FTE's
Group Leader/Scientist
Secretary
Four full-time technical staff (May include agency staff detailed under the Inter-Governmental Personnel Act)
Travel and Incidental Expenses - Computers, software, hardware, supplies
Technical support resources including modeling, data analysis, etc

7.1.3.2 Rehabilitation Implementation Group (RIG)

A group of engineers, technicians, and contract specialists responsible for implementing the on-the-ground design and construction activities associated with the AEAM organization. The group is supervised by a Group Leader who is under the supervision of the Executive Director. The Rehabilitation Implementation Group (RIG) collects design data, prepares designs, awards contracts, and manages construction for bridge replacements, rehabilitation projects, gravel augmentation, riparian revegetation, flood plain creation, objective specific monitoring, and sediment management projects. The RIG performs all necessary realty actions and environmental permit requirements including environmental compliance. Contacts the public to address implementation issues such as obtaining borrow and waste sites, access agreements, and maintenance agreements. The RIG works closely with the TMAG to achieve a common understanding of desired design concepts and coordinates construction activities to insure any rehabilitation activity modifications are implemented with full approval of the TMC.

Membership

Full time Group Leader with background in engineering and experience in management of river restoration programs. Directly supervised by the TMC Executive Director.
Civil Engineer
Engineering Technician/Surveyor
Contracting Officer
Part-time support from:
- Construction Inspector
- Construction contract specialist
- Realty Specialist
- Field Engineer

Roles & Responsibilities

Preparing and implementing contracting for objective specific monitoring and rehabilitation activities upon approval of the TMC
Collaborates with TMAG and Executive Director on program implementation
Submits annual report to Executive Director on accomplishments, expenditures, and budget needs

Channel Rehabilitation

Collaborates with TMAG to develop design concept for each site and environmental review
Contacts property owners to explain concept and obtain right of entry
Collects design data, prepares location maps, performs field explorations
Coordinates with TMAG to obtain pre- and post-project monitoring
Prepares designs, cost estimates, and information on local contractors

Awards construction contracts
Performs management during construction including quality control and contractor payments
Bridge Replacements
Prepare design concept for each site
Contacts property owners to explain concept and obtain right of entry and maintenance agreements
Collects design data, prepares location maps, performs field explorations
Prepares designs and cost estimates
Awards construction contracts
Performs construction management
Flood Plain Creation
Collaborates with TMAG to develop design concept for each site and environmental review
In concert with gravel augmentation and fine sediment management and revegetation
Obtains/Identifies inundation zones
Locates impacted flood plain improvements
Performs property surveys
Negotiates easements including structure removal/relocation agreements
Remove/Relocate existing structures
Gravel Augmentation and Fine Sediment Management
Collaborates with TMAG to develop design concept for each site and environmental review
Prepares designs and cost estimates
Awards augmentation contracts
Performs gravel placement activities
Objective Specific Monitoring
In concert with TMAG, select objective specific monitoring and rehabilitation activity contractors
Provide contract management for all monitoring activities
Watershed Rehabilitation
Coordinates with land management agencies

Staff

Four FTE's including:
Group Leader
Civil Engineer
Contracting Officer
Engineering Technician/Surveyor

Travel and Incidental Expenses
Computers

7.1.4 Independent Review Panels

To assure scientific credibility all monitoring and studies will be awarded through a competitive process using RFP's and independent outside review panels. A Scientific Advisory Board will provide overall review and recommendations to the TMC relative to the science aspects of the AEAM organization. Specific Review Committees will be organized as needed to review rehabilitation, monitoring and study designs as well as proposals and reports.

7.1.4.1 Scientific Advisory Board

Five scientists, recognized as experts in the disciplines of fisheries biology, fluvial geomorphology, hydraulic engineering, hydrology, riparian ecology, wildlife biology, or aquatic ecology, form a Scientific Advisory Board (SAB). It is important that members serve a reasonably long term to reduce "get up to speed" expenses, but short enough that the organization periodically gets new ideas and perspectives. Members must be objective in keeping the science separate from policy. Each member serves a four-year rotating term. The Executive Director appoints the members of the Board from candidates nominated by the TMC, TMAG Team Leader, TAMWG, and Regulatory Agencies, based upon technical capability. They would meet at least once each year with the TMAG.

Membership

Part-time. Five recognized scientists in various disciplines. Time commitment roughly 5% – 10%/yr that may come in periodic bursts of effort such as when the TMAG develops alternative hypotheses, study plans, flow recommendations, rehabilitation activities, and special data collection activities for the coming year.

Roles & Responsibilities

Scientific peer review of hypothesis testing, proposed annual flow schedules, short and long-term monitoring plans, research priorities.

Periodic review (roughly every 5 years) of the overall AEAM Organization

Review reports & recommendations produced by the Technical Modeling and Analysis Group.

Review suggestions for new or alternative hypotheses & methods of testing of existing hypotheses.

Staff

No additional staff. The TMAG will provide support. SAB members will be reimbursed for their time and travel at their current organizational or industry rates

Total Five FTE's

7.1.4.2 Review Committees

Outside review committees will be formed to review specific proposals and study designs. For each proposed Objective Specific activity a review committee of subject area experts, not directly involved with the proposed project or otherwise having a conflict of interest, will be solicited to provide recommendations on specific proposed activities. These peer reviews will provide recommendations on proposals submitted in response to RFP's.

Membership

Review Committee members will be selected from nominations by the SAB, AEAMT and TAMWG.

When no conflict of interest exists TAC members of TAMWG having appropriate expertise will serve on individual reviews.

Roles and Responsibilities

For each Trinity Restoration Program funded activity a specific Review Committee will be formed to provide input and recommendations relative to personnel qualifications and experience, study approach, statistical design, adequacy of proposed budget, etc.

7.2 Objective Specific Monitoring

Long-term monitoring evaluates the overall restoration effort, and also provides baseline and subsequent data for trend analyses. Long-term data include gaging data, sediment transport data, water temperature data, smolt outmigration data, adult escapement estimates, redd mapping, monitoring index reaches, and rehabilitation sites. Restoration program funded long-term monitoring will be awarded by contract or self-governance agreements if applicable to agencies, tribes, and contractors in response to RFP's authorized by the TMC.

Short-term monitoring seeks to evaluate cause and effect in the context of specific hypotheses, and competing hypotheses for specific calendar years given the water year runoff forecast, sediment input, and level of salmon escapement. Short-term monitoring may include studies such as water temperature-salmonid growth rates, delta maintenance needs, and riparian regeneration processes. Short-term monitoring may be needed simply to fill information gaps. To assure scientific credibility all monitoring and studies will be awarded through a competitive process using RFP's and independent review panels.

Membership

Personnel of successful applications from:

- Agencies
- Tribes
- Contractors

Roles & Responsibilities

Short-term specialized monitoring such as annual site specific data collection for hypothesis testing, would be contracted through annual solicitations from agencies, tribes, universities, and consulting firms by issuing Requests For Proposals (RFP's) and awarding annual or multiple year contracts

Long-term trend monitoring needs would be contracted with local Agencies and Tribes having technical expertise. The local agency and/or tribe will prepare work plans and data collection designs based upon scopes of work developed by the TMAG. They will submit the work plans for scientific peer review and after appropriate review and modification the agencies and/or tribes will be funded.

Implement monitoring projects as specified in contracts

7.3 Funding for ROD Implementation

Table 6 presents costs for implementation of the Record of Decision over a period of three years. The majority of funds are expected to come through the Department of Interior agencies. Additional program funding however may be obtained from the State of California, other federal agencies, and other sources (See section 5.4).
itemizes a further breakout of the objective specific monitoring costs for long and short-term monitoring and GIS maintenance and public information.

TABLE 6
Funding for ROD Implementation[a,b] (Amounts in Thousands of Dollars)

Activity	Year 1 ($)	Year 2 ($)	Year 3 ($)	Total 3 yrs ($)
Bridge Construction[c]	350	5,700	0	6,050
Houses/outbuildings[c]	125	225	0	350
Channel Rehab projects[c]	2,150	2,400	2,400	6,950
Watershed Restoration	2,000	2,000	2,000	6,000
Coarse and Fine sediments[c]	50	50	355	455
Objective Specific Monitoring[d]	5,640	5,176	5,176	15,992
AEAM Team (Staffing)[d]	2,025	2,025	2,025	6,075
TOTAL	12,340	17,576	11,956	41,712

[a]Estimated out-year costs. During the first 3 years, half of the channel rehabilitation projects will be constructed. Additional out-year funds will be necessary to complete the second half. Costs are assumed to be the same as the first half. For watershed restoration, $2 million annually for roughly 20 years is necessary. Annual coarse and fine sediment costs are expected to average $260,00 per year but will vary depending on needs identified through adaptive management. Adaptive management costs are approximated at $5.2 million per year indefinitely.

[b]Bridge and Infrastructure modifications are phased in (included in years 1 and 2) with the bulk reflected in year 2. Therefore, a true estimate for an "annual" budget would be best represented by year 3 at $11.8 million.

[c]Costs taken from USBR Mainstem Trinity Habitat and Floodplain Modifications Report (2/2000).

[d]Costs taken from Stalnaker and Wittler AEAM report (4/2000).

TABLE 7
Break Out Costs for Objective Specific Monitoring (1,000s of $)

Long term monitoring:	
Fish monitoring (escapement, smolt production, etc)	2,247
Fish monitoring and modeling (habitat, temp, SALMOD)	914
Channel morphology and riparian monitoring	330
Gaging stations	175
Hydraulic and sediment transport monitoring/modeling	160
GIS maintenance and public info	145
Subtotal	**3,971**
Short term directed monitoring	1205
TOTAL	**5,176**
Additional first year only cost (GIS system and gaging stations)	464
TOTAL FIRST YEAR COSTS	**5,640**

7.4 Peak Flow Release Example for Extremely Wet Water Year

The theory, objectives, and structure of the proposed adaptive environmental assessment and management (AEAM) organization are broadly described in the Trinity River Flow Evaluation Report (USFWS and HVT, 1999). The material presented in previous sections of this report provides more detail on roles, responsibilities, and budgetary needs of the organization. However, to date, there has not been a detailed example of how adaptive

management would actually be used to manage the Trinity River. As stated in the Trinity River Flow Evaluation Study:

> *"a well-designed AEAM program (1) defines goals and objectives in measurable terms; (2) develops hypotheses, builds models, compares alternatives, and designs system manipulations and monitoring programs for promising alternatives; (3) proposes modifications to operations that protect, conserve and enhance the resources; and (4) implements monitoring and research programs to examine how selected management actions meet resource management objectives."*

The following section provides an example of the AEAM process, using the magnitude and duration of the annual high flow release as the example.

7.4.1 High Flow Magnitude

Hypotheses:

- Bed and bar scour discourages riparian vegetation establishment, thereby maintaining salmonid spawning and rearing habitat (and salmonid production)
- Adequate bed mobility results in reduced fine sediment storage in surface layer, reduced embeddedness, and improved habitat for benthic invertebrates and salmon spawning (and salmonid production)
- Bar scour and re-deposition (combined with reduced fine sediment supply) flushes spawning gravels, improving salmonid egg-emergence success (and salmonid production)
- There is a quantifiable relationship between increasing discharge and the amount of bed and bar scour depth and deposition
- Higher flows occur more frequently during wetter water years

Objectives:

1. Mobilize D_{84} gravel bed surface on bars and riffles
2. Scour and re-deposit bars and riffles to a depth greater than 2 D_{90}'s

Empirical data show that flows greater than 6,000 ft^3/s cause general bed mobilization indicated by the D_{84} particle size on bars and riffles. In a mixture of river gravels, the D_{84} represents the size for which 84 percent of the particles are finer. Empirical data relating flow and hydraulic conditions to bed scour (Wilcock, 1995; McBain and Trush, 1997) show flows ranging between 8,000 ft^3/s and 16,000 ft^3/s cause relative scour depths (scour/D_{90}) greater than two over most of the bar/bed surface. Observations of bed scour at the Bucktail bank rehabilitation site indicate a peak flow of 11,400 ft^3/s caused relative bed scour ranging from several D_{90} layers deep down in the channel to 1.35D_{90} deep midway up the point bar. A combination of Bucktail site data and median values of the compiled empirical data resulted in an initial conclusion that a peak discharge of 11,000 ft^3/s should be released in Extremely Wet water years to satisfy the bar surface scour objective. AEAM will enhance ability to achieve specific objectives by: 1) continuing to add empirical data relating bed

scour to discharge at index sites, 2) developing/utilizing models that better describe the physical processes that cause bed scour.

7.4.2 High Flow Duration

Hypotheses:

- Increasing, maintaining, and routing coarse sediment supply will increase number and extent of bars
- Increased number and extent of bars will increase quantity and quality of salmonid spawning and rearing habitat, and salmonid production will thereby increase.
- Removing delta-formed backwaters will allow coarse sediment to route through the reach from upstream reaches, further increasing the number and extent of bars.
- Transporting fine sediment at a rate greater than input will decrease fine sediment storage in the mainstem Trinity River
- Decreasing fine sediment storage in the mainstem Trinity River will increase pool depth, decrease embeddedness, and decrease percent fines in spawning gravels (thereby increasing salmonid production)

Objectives:

1. Transport coarse sediment in upper river (near Deadwood and Rush creeks) at a rate equal to input.
2. Transport fine sediment in upper river (near Deadwood, Rush, and Grass Valley creeks) at a rate greater than input

Combining high flow magnitude with duration determines the total coarse and fine sediment transport capacity of the mainstem Trinity River. Measurements have been and continue to be taken on the mainstem Trinity River and tributaries to develop relationships between flow magnitude and fine & coarse sediment transport. This information can be predicted virtually on a real-time basis.

Objective 1

Evaluate objective 1 by comparing coarse sediment transport rates at both the Lewiston (RM 110) and Limekiln Gulch gaging stations (RM 98) with cumulative coarse sediment input rates from Deadwood Creek and Rush Creek. On an interim basis, because the TRD has greater influence on mainstem sediment transport closer to the dam, use the Rush Creek and Deadwood Creek coarse sediment yield as the management objective (transport sediment on the mainstem at a rate equal to input from Rush and Deadwood creeks). The duration of high flow recommendations in the TRFES is based on extrapolation of measured data to a long-term record to estimate sediment transport needs for each individual water year. For Extremely Wet water years, the duration is 5 days at 11,000 ft^3/s. Tributary sediment yield is most dependent on peak flow magnitude (that is partially dependent on water year class, i.e., typically, the wetter the water year, the more coarse sediment delivered to the mainstem); therefore, there is variability in year-to-year tributary sediment yields.

Objective 2

Evaluate Objective 2 by comparing fine sediment flux at the Limekiln Gulch gaging station with the estimated cumulative fine sediment yield from Deadwood Creek, Rush Creek, and Grass Valley Creek. Attempts to extrapolate fine sediment yield by water year class is more variable than coarse sediment.

7.4.3 Adaptive Management Example

Peak flows of five days' duration is the recommended starting point for the scheduled annual flows; in reality, peak flow duration should vary by the volume of sediment delivered to the mainstem Trinity River from tributaries for each individual water year (rather than averaging many years for a water year class). Using the coarse sediment management objectives as an example, AEAM would implement high flow recommendations based on the following real-time approach:

October 1 to April 1

1) Establish coarse sediment monitoring cross sections in mainstem Trinity River, focusing on the deltas (with large coarse sediment storage) and downstream reaches (with small coarse sediment storage).
2) Install bed mobility and scour projects at representative study sites. Develop bed mobility and or scour models to predict as a function of flow magnitude.
3) Monitor the volume of coarse sediment delivered to the mainstem Trinity River by tributaries by natural storm runoff events, particularly from Rush Creek. Summarize the volume of coarse sediment contributed by each tributary. For example, assume that 10,000 yd^3 of tributary derived coarse sediment needs to be transported by the mainstem during a given year.
4) Refine mainstem coarse sediment transport rates based on field measurements
5) Develop a hydraulic and sediment routing model for the upper portion of the mainstem Trinity River. Combine mainstem sediment transport relationship (input) with physical data downstream of tributaries into a sediment routing model (e.g., HEC-6 or better) to better calibrate model. This model will predict yd^3 of coarse sediment transported as a function of flow magnitude and duration, and will predict channel response (increasing or decreasing coarse sediment storage) at each cross section.

March 1 to April 1

6) Water supply forecasting to predict water year, culminating in a final water year designation on April 1. Assume an Extremely Wet year for this example.

April 1 to May 1

7) Because it is predicted to be an extremely wet year, the magnitude of the recommended flow is set at 11,000 ft^3/s to achieve bed/bar mobility and scour objectives.
8) Predict the duration of 11,000 ft^3/s flow release needed to transport 10,000 yd^3 of coarse sediment. Run sediment routing model predict the duration of 11,000 ft^3/s needed to transport 10,000 yd^3. Assume that model indicates 4 days. Therefore, the recommended duration of the 11,000 ft^3/s flow release is 4 days. Timing will be based on Chinook salmon smolt outmigration information; assume May 24-May 27.
9) This recommendation integrates into other team recommendations for that year and is forwarded to decision makers.

May 24-May 27

10) Conduct release.
11) Monitor coarse sediment transport to calibrate and improve sediment transport model
12) Monitor hydraulic parameters to calibrate and improve sediment transport model, bed mobility models, and bed scour models

May 27-July 22

13) Downramp flows to 450 ft^3/s.
14) Begin reducing and analyzing data.

July 22-October 1

15) Monitor coarse sediment storage by resurveying cross sections. This will also evaluate the coarse sediment transport model predictions, and will help better calibrate the model for future predictions.
16) Monitor bed mobility and bed scour at representative study sites. Evaluate and calibrate bed mobility and bed scour models.
17) Analyze data, summarize results, prepare reports, and solicit outside scientific review of hypotheses, study plan, modeling, and results.
18) Revise hypotheses, study plan, and models as appropriate.

This approach greatly enhances our ability to achieve specific objectives, while allowing a much better predictive capability in each successive year (predict and monitor rather than simply reacting to long-term monitoring results).

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Attachment 1 Lewiston Dam Releases to the Trinity River					
Date	Extremely Wet	Wet	Normal	Dry	Critically Dry
01-Oct thru 15 Oct	450	450	450	450	450
16-Oct thru 21-Apr	300	300	300	300	300
22-Apr	500	500	500	300	300
23-Apr	500	500	500	300	900
24-Apr	500	500	500	300	1,500
25-Apr	500	500	500	300	1,500
26-Apr	500	500	500	300	1,500
27-Apr	500	500	500	900	1,500
28-Apr	500	500	500	1,500	1,500
29-Apr	1,500	2,000	2,500	2,500	1,500
30-Apr	1,500	2,000	2,500	3,500	1,500
01-May thru 05-May	1,500	2,000	2,500	4,500	1,500
06-May	2,000	2,500	4,000	4,306	1,500
07-May	2,000	2,500	6,000	4,121	1,500
08-May	2,000	2,500	6,000	3,943	1,500
09-May	2,000	2,500	6,000	3,773	1,500
10-May	2,000	2,500	6,000	3,611	1,500
11-May	2,000	2,500	6,000	3,455	1,500
12-May	2,000	2,500	5,784	3,307	1,500
13-May	2,000	2,500	5,574	3,164	1,500
14-May	2,000	3,000	5,373	3,028	1,500
15-May	2,000	4,000	5,178	2,897	1,500
16-May	2,000	6,000	4,991	2,773	1,500
17-May	2,000	8,500 [a]	4,811	2,653	1,500
18-May	2,000	8,500 [a]	4,637	2,539	1,500
19-May	2,000	8,500 [a]	4,469	2,430	1,500
20-May	3,000	8,500 [a]	4,307	2,325	1,500
21-May	4,000	8,500 [a]	4,151	2,225	1,500
22-May	6,000	7,666 [a]	4,001	2,129	1,500
23-May	8,500 [a]	6,833 [a]	3,857	2,037	1,500
24-May	11,000 [a]	6,000	3,717	1,950	1,500
25-May	11,000 [a]	6,000	3,583	1,866	1,500
26-May	11,000 [a]	6,000	3,453	1,785	1,500
27-May	11,000 [a]	6,000	3,328	1,708	1,500
28-May	11,000 [a]	6,000	3,208	1,635	1,500
29-May	10,444 [a]	5,690	3,092	1,564	1,500
30-May	9,889 [a]	5,322	2,980	1,497	1,497
31-May	9,333 [a]	4,977	2,872	1,433	1,433
01-Jun	8,778 [a]	4,655	2,768	1,371	1,371
02-Jun	8,222 [a]	4,354	2,668	1,312	1,312
03-Jun	7,667 [a]	4,072	2,572	1,255	1,255
04-Jun	7,111 [a]	3,809	2,479	1,201	1,201
05-Jun	6,556 [a]	3,562	2,389	1,150	1,150
06-Jun	6,000	3,332	2,303	1,100	1,100
07-Jun	6,000	3,116	2,219	1,053	1,053
08-Jun	6,000	2,915	2,139	1,007	1,007
09-Jun	6,000	2,726	2,062	964	964
10-Jun	6,000	2,550	2,000	922	922
11-Jun	5,664	2,385	2,000	883	883
12-Jun	5,359	2,230	2,000	845	845
13-Jun	5,071	2,086	2,000	808	808
14-Jun	4,798	2,000	2,000	774	774
15-Jun	4,540	2,000	2,000	740	740

Attachment 1 Lewiston Dam Releases to the Trinity River					
Date	**Extremely Wet**	**Wet**	**Normal**	**Dry**	**Critically Dry**
16-Jun	4,295	2,000	2,000	708	708
17-Jun	4,064	2,000	2,000	678	678
18-Jun	3,845	2,000	2,000	649	649
19-Jun	3,638	2,000	2,000	621	621
20-Jun	3,443	2,000	2,000	594	594
21-Jun	3,257	2,000	2,000	568	568
22-Jun	3,082	2,000	2,000	544	544
23-Jun	2,916	2,000	2,000	521	521
24-Jun	2,759	2,000	2,000	498	498
25-Jun	2,611	2,000	2,000	477	477
26-Jun	2,470	2,000	2,000	450	450
27-Jun	2,337	2,000	2,000	450	450
28-Jun	2,212	2,000	2,000	450	450
29-Jun	2,093	2,000	2,000	450	450
30-Jun thru July 9	2,000	2,000	2,000	450	450
10-Jul	1,700	1,700	1,700	450	450
11-Jul	1,500	1,500	1,500	450	450
12-Jul	1,350	1,350	1,350	450	450
13-Jul	1,200	1,200	1,200	450	450
14-Jul	1,050	1,050	1,050	450	450
15-Jul	950	950	950	450	450
16-Jul	850	850	850	450	450
17-Jul	750	750	750	450	450
18-Jul	675	675	675	450	450
19-Jul	600	600	600	450	450
20-Jul	550	550	550	450	450
21-Jul	500	500	500	450	450
22-Jul to 30 Sep	450	450	450	450	450
Acre-Feet (Thousands)	**815.2 (721.1)[b]**	**701.0 (671.3) [b]**	**646.9**	**452.6**	**368.6**

[a]Releases restricted to 6,000 ft^3/s until floodplain improvements have occurred

[b]Annual allocations that reflect a maximum Lewiston Dam release of 6,000 ft^3/s until floodplain improvement projects are completed.

Attachment 2. Memorandum from USFWS to USBR February 5, 1997. Page 1 of 2.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

COASTAL CALIFORNIA FISH AND WILDLIFE OFFICE
1125 16TH STREET, ROOM 209
ARCATA, CA 95521
(707) 822-7201
FAX (707) 822-8411

Feb 5, 1997

Mr. Paul Fujitani
U.S. Bureau of Reclamation
Central Valley Operations
Sacramento, CA 95821

Subject: Down ramping from unscheduled winter flows in the Trinity River.

We appreciate your invitation to provide assistance in evaluating the current ramping schedules used on the Trinity River system. In particular, we would like to provide some input regarding stranding of salmonid sac-fry and fry during the winter storm season and how down ramping schedules could be modified to help protect these early life stages.

General Information

Evaluation of stranding of salmonids in the Trinity River has been conducted in the past. During the time the Flow Evaluation was being conducted by the Service, staff assessed stranding of juvenile salmon and steelhead. Typically these surveys occurred after scheduled high flow events which occurred in late Spring. These surveys used direct observation with mask and snorkel to determine presence or absence of fish in areas behind the berms adjacent to the Trinity River. Results of these studies and others (CH2M Hill 1990, Bauersfeld 1978, Hamilton and Buell 1976, Hunter 1992, Bradford et al. 1995, Olson and Metzgar 1987) found reduced stranding with increased fish size (>50 mm).

While stranding of juveniles (> 50 mm) does not appear to be a problem in the Trinity River, more recent studies on the Trinity River have indicated that stranding of the earlier life stages (< 50 mm)(sac-fry and fry), can be significant (Memo to files from Zedonis, April 5, 1996 and memo to the Bureau of Reclamation from CDFG, April 12, 1996). During these studies, it was found that many sac-fry, fry, and a few juvenile salmonids were stranded when unscheduled flows were reduced using the current OCAP ramping schedule (Table 1). Although not studied in the Trinity, stranding of aquatic insects, a popular food source for salmonids, probably also occurs (Gislason 1985).

Timing of Down ramping can also influence the rate at which sac-fry and fry can be stranded. During the winter months, when water temperatures are cold, fry are generally found hiding in and around cover objects near the waters edge during the daylight hours (Zedonis pers. comm and many others). Because flow reductions during this time are generally not sensed by these fish, they become stranded (Bradford et al. 1995). Contrary to day-time, salmonid fry and

Attachment 2. Memorandum from USFWS to USBR February 5, 1997. Page 2 of 2

juveniles become more active and less dependent on cover items during the night in the winter (Zedonis pers. comm; Campbell and Neuner 1985) and therefore are less vulnerable to stranding (Woodin 1984, Bradford et al. 1995).

Recommendations

In light of the information provided, and the possibility of this years flows resulting in some stranding, the Service would like to recommend the following conservative ramp schedule to better protect early life stages of salmonids and aquatic invertebrates.

1. Limit fluctuations in flow during the incubation and early rearing periods (January thru March) to prevent cumulative loss of fry and sac-fry.

2. Slow down ramping to levels below those listed in the OCAP report during the winter months when fish are small and more susceptible to stranding (see Table 1).

3. Limit flow reductions to night-time hours during the winter months.

4. Conduct studies, when opportunities arise, to better ascertain limitation and or refinements to these recommendations.

Table 1.

If existing release is:	Rate of Change (ft^3/sec)	
	Existing OCAP Decrease	Recommended Decrease
Above 6,000	500 per 4 hr	500 per 4 hr
6,000 to 4,000	500 per 4 hr	400 per 4 hr
2,000 to 4,000	500 per 4 hr	200 per 4 hr
500 to 2,000	200 per 4 hr	100 per 4 hr
300 to 500	100 per 4 hr	50 per 4 hr

Should you have any questions or need additional information, please contact Paul Zedonis of my staff at 707-822-7201.

Sincerely,

Tom T. Kisanuki

(for) Bruce Halstead
Project Leader

APPENDIX B

RECORD OF DECISION

U.S. Department of the Interior
Record of Decision
Trinity River Mainstem Fishery Restoration
Final Environmental Impact Statement/Environmental Impact Report
December 2000

I. Introduction and Statement of Decision

The Trinity and Klamath Rivers in northern California once teemed with bountiful runs of salmon and steelhead. Historically, hundreds of thousands of salmon and steelhead would enter the Klamath estuary and migrate upstream during several months of the year. After traveling through the lower 44 miles of the Klamath River, many of these fish would turn south at the confluence of the Trinity River and continue their journey to the middle and upper Trinity River. Adult salmon and steelhead would spawn in the clean gravels of the mainstem Trinity and several of its tributaries. Millions of young salmonids would then emerge from the gravel between January and June and rear in the diversity of habitats found in the river. The young of some species would begin their downstream migration to the Pacific Ocean within a few months of emerging from the gravel where they were spawned. Others remained in the river for a year or more before beginning their downstream migration. All of these fish would grow as they moved downstream through the Trinity, lower Klamath Rivers and Klamath estuary, undergoing physiological changes in preparation for life in the ocean. Suitable habitat and water quality were critical for the young salmon and steelhead during every stage of their outmigration in order for them to grow and become physically able to tolerate the transition to ocean life. After several years in the ocean fish return to the Klamath River as adults and once again begin the upstream migration to the Trinity River to spawn in their natal streams.

These impressive fish stocks defined the life and culture of the Hoopa Valley and Yurok Indian Tribes, and reservations were established along the Trinity and lower Klamath Rivers in the mid- to late-1800s based in large part on the Tribes' reliance on these resources. The abundance of the region's fishery resources also helped support the economy and way of life for the people of the region as a whole.

The once majestic runs in the Trinity River experienced significant declines following the construction and operation of the Central Valley Project's Trinity River Division (TRD) in the early 1960s. The TRD not only eliminated 109 miles of important salmonid habitat above Lewiston, California, but also exported to the Sacramento River as much as 90 percent of the waters flowing into the Trinity River at Lewiston, California. In authorizing the TRD, Congress believed water excess to the needs of the Trinity Basin could be diverted to the Central Valley while still ensuring the preservation and propagation of the Trinity Basin's fish and wildlife resources. Since the precipitous fishery declines, Congress has enacted several pieces of legislation directing the restoration of fish populations in the Trinity River. In addition to various multi-jurisdictional efforts over the years, the U.S. Fish and Wildlife Service (Service), in conjunction with the Hoopa Valley Tribe, completed the Trinity River Flow Evaluation Study

(TRFES) in 1999 which sought to determine instream flows and other measures necessary to restore and maintain the Trinity River's fishery.

This Record of Decision (ROD) culminates nearly twenty years of detailed, scientific efforts, conducted over the course of the past four Administrations, and documents the selection of actions determined to be necessary and appropriate to restore and maintain the anadromous fishery resources of the Trinity River. These actions, and other potential alternative actions, have been described and fully evaluated pursuant to the National Environmental Policy Act of 1969, as amended (NEPA), and the California Environmental Quality Act (CEQA) in both a draft and the Final Environmental Impact Statement/Environmental Impact Report (FEIS/EIR) (October 2000b), herein incorporated by reference. The Service, the Bureau of Reclamation (Reclamation), the Hoopa Valley Tribe, and the County of Trinity, California jointly prepared the DEIS/EIR and the FEIS/EIR. The necessity for these actions results from the various statutory obligations of the Department as well as the federal trust responsibility to the Hoopa Valley and Yurok Indian Tribes.

For the reasons expressed in this ROD, the Department's agencies are directed to implement the Preferred Alternative as described in the FEIS/EIR and as provided below. This alternative best meets the statutory and trust obligations of the Department to restore and maintain the Trinity River's anadromous fishery resources, based on the best available scientific information, while also continuing to provide water supplies for beneficial uses and power generation as a function of Reclamation's Central Valley Project (CVP).

In making this decision, the information and analyses contained in the FEIS/EIR have been reviewed and considered in detail, including; 1) the various alternatives considered to achieve the statutory and trust obligations imposed upon the Department, 2) the environmental and other factors relevant to making this decision, 3) the mitigation available to reduce or eliminate negative impacts which could result from this decision, 4) the comments received on both the DEIS/EIR and the FEIS/EIR, and 5) the Biological Opinions from the Service and the National Marine Fisheries Service (NMFS), also incorporated by reference, which evaluate the impacts of implementing the Preferred Alternative to species listed pursuant to the Endangered Species Act. Sufficient legal authority exists to implement this decision.

This decision recognizes that restoration and perpetual maintenance of the Trinity River's fishery resources require rehabilitating the river itself, restoring the attributes that produce a healthy, functioning alluvial river system. Therefore, the components of the selected course of action include:

- Variable annual instream flows for the Trinity River from the TRD based on forecasted hydrology for the Trinity River Basin as of April 1st of each year, ranging from 369,000 acre-feet (af) in critically dry years to 815,000 af in extremely wet years;

- Physical channel rehabilitation, including the removal of riparian berms and the establishment of side channel habitat;

- Sediment management, including the supplementation of spawning gravels below the TRD and reduction in fine sediments which degrade fish habitats;

- Watershed restoration efforts, addressing negative impacts which have resulted from land use practices in the Basin; and

- Infrastructure improvements or modifications, including rebuilding or fortifying bridges and addressing other structures affected by the peak instream flows provided by this ROD.

The selected alternative also includes an Adaptive Environmental Assessment and Management (AEAM) Program. The AEAM Program, guided by a Trinity Management Council (TMC) established as part of this decision and by sound scientific principles, will ensure the proper implementation of these measures, conduct appropriate scientific monitoring and evaluation efforts, and recommend possible adjustments to the annual flow schedule within the designated flow volumes provided for in this ROD or other measures in order to ensure that the restoration and maintenance of the Trinity River anadromous fishery continues based on the best available scientific information and analysis.

This ROD and its attachments: 1) provide background information about the necessity for and development of the chosen action; 2) describes the alternatives considered in reaching the decision, including the environmentally preferred alternative; 3) summarizes the key provisions of the decision; 4) presents the rationale for and critical issues considered in making the decision; 5) describes mitigation measures available (and other environmental commitments) to avoid or minimize environmental harm that may result from implementing the decision; 6) reviews the public involvement process conducted during these efforts; and 7) discusses comments received on the FEIS/EIR.

II. Background

A. Historic Trinity River and its Resources

Historically, the Trinity River achieved attention and fame for its abundance of salmon and steelhead. Annual salmon runs in the Klamath Basin, including the Trinity River as its largest tributary, once reportedly totaled approximately 500,000 salmon. At the peak of the salmon cannery industry, which dominated the area at the turn of the 20th century, approximately 141,000 salmon were harvested and canned within the Klamath estuary (Snyder 1931).Various investigations made prior to construction of Lewiston and Trinity dams provide estimates of the historic numbers of fish in the Trinity. Estimates of the number of fall chinook salmon that migrated above the North Fork Trinity River before construction of the dams range from

approximately 19,000 to over 75,000 (TRFES,1999) (see FEIS/EIR, Appendix B for further details of the fishery resources of the Trinity).

The fishery and other resources of the Trinity River and the lower Klamath River Basins defined the life and culture of area Indians since time immemorial. Salmon and other fish historically provided the primary dietary staple for the Indians in the area; prior to non-Indian settlement in the basin, reports indicate that local Indians consumed over 2 million pounds of salmon annually. The fishery resources supported commercial and subsistence economies for the Indians and also played a significant role in their religious beliefs. Fishery resources of the area have been characterized as "not much less necessary to the existence of the Indians than the atmosphere they breathed." Blake v. Arnett, 663 F.2d 906, 909 (9th Cir. 1981) (quoting United States v. Winans, 198 U.S. 371, 381 (1905)). As previously described by the Department's Solicitor, a specific, primary purpose for establishing the reservations of the Hoopa Valley and Yurok Tribes in the mid- to late-1800s–which are bisected by the Trinity and lower Klamath Rivers, respectively–"was to secure to these Indians the access and right to fish without interference from others" in order to preserve and protect their right to maintain a self-sufficient livelihood from the abundance provided by the rivers (Memorandum from Solicitor to Secretary, Fishing Rights of the Yurok and Hoopa Valley Tribes, M-36979, at 15, 18-21 (Oct. 4, 1993)).

B. Planning and Construction of the CVP's Trinity River Division

Over time and with the increase of populations and development in California, particularly in the Central Valley, efforts focused on the Trinity River as a resource to supplement the needs of other areas of California. Initial plans to divert Trinity River water to the Sacramento River were included in the California State Water Plan in the 1930s, but later dropped. Proposals were reinitiated in the late 1940s, and the Department provided to Congress reports and findings on a proposed plan of development in the early 1950s. These reports indicated that more than 1.1 million af of inflow occurred on average from the upper Trinity River Basin above Lewiston. Based on these reports, Congress concluded that water "surplus" to the present and future water needs of the Trinity and Klamath Basins–then estimated at approximately 700,000 af and considered "wasting to the Pacific Ocean"--could be diverted to the Central Valley "without detrimental effect to the fishery resources." (H.R. Rep. No. 602, 84th Cong., 1st Sess. 4-5 (1955); S. Rep. No. 1154, 84 Cong., 1st Sess. 5 (1955)). In fact, the underlying reports suggested that development of the Trinity River Division, and the resulting diversions, would not only maintain but also improve fishery conditions in the Trinity River, with as little as 120,500 af of water per year from above Lewiston dedicated to the fishery. Based on these understandings, Congress passed legislation authorizing the Trinity River Division (TRD) on August 12, 1955 (Pub. L. No. 84-386) (1955 Act). Although Congress authorized the TRD as an integrated component of the CVP, section 2 of the 1955 Act specifically directed the Secretary of the Interior to ensure the preservation and propagation of fish and wildlife in the Trinity Basin through the adoption of appropriate measures.

C. Impacts Caused by the TRD and Early Efforts to Address those Impacts

Unfortunately, construction and operation of the TRD resulted in unintended, yet severely detrimental impacts to the Trinity River and its fish populations. Early studies suggested that low flows could possibly sustain spawning populations of salmonids below Lewiston (Moffet and Smith 1950, USFWS and CDFG 1956). These and other early studies focused more on chinook salmon spawning populations than on other species or lifestages, and did not entirely account for the geomorphic changes that would occur under a reduced flow in the mainstem. Relying upon these early studies, TRD diversions to the Central Valley averaged nearly 90 percent of the upper Trinity Basin inflow for the first ten years of full TRD operations, with the TRD exporting on average 1,234,000 af annually from the 1,396,000 af total average inflow into Trinity Lake (formerly Clair Engle Reservoir). Construction of the two dams on the Trinity River, Trinity and Lewiston Dams, also resulted in the loss of all upstream spawning and rearing habitat. As subsequent studies have shown, the TRD also caused the rapid degradation of fish habitats below the dams, through the elimination of gravels from above the dams necessary for spawning habitat and the inability of the substantially reduced and static flows from the TRD to flush fine sediments from the existing gravels. The resulting channelization of the river (in which riparian vegetation encroached upon the channel, trapped fine sediments, and formed fossilized berms) further degraded available habitats.

At the same time that fish were forced to use a much smaller amount of area, the quality of habitat below Lewiston began to decline almost immediately following completion of the dams. Gravels necessary for spawning habitat were trapped above the dams. Deep pools that were essential for holding adults began to fill with fine sediment. Since flows were no longer sufficient to move fine sediment from tributary flows out of the mainstem, gravel and cobble became compacted with sand and silt rendering spawning gravels unsuitable for salmon reproduction. As sand accumulated along the banks of the river, the shape of the Trinity below Lewiston changed from a meandering alluvial river with large cobble bars to a narrow, steep-sided channel. Moderate flows that resulted from tributary floods resulted in greatly increased water velocity in the mainstem without resultant increases in useable habitat because most flow was contained within the main channel and not connected with the historic floodplain.

Within a decade, salmon and steelhead populations declined significantly. Various efforts (including the formation of a task force of federal, state, tribal, and local agencies) began evaluating the effects on the Trinity River's fishery resources and the likely causes for these declines. The Service completed an EIS in 1980 which estimated fish population reductions of 60 to 80 percent since completion of the TRD. Subsequent studies have also indicated extensive reductions in fish populations (see Appendix B of the FEIS/EIR). The 1980 EIS attributed this severe and rapid depletion of fish populations to three causative factors: inadequately regulated harvest, excessive streambed sedimentation, and insufficient streamflows. The latter two elements impact key components of salmonid habitat. In fact, the EIS estimated the loss of fishery habitats in the Trinity River Basin to be 80 to 90 percent. Thus, shortly after construction of the TRD, the Trinity River no longer provided the abundant resources and pristine area that the public treasured and resident Tribes depended upon for physical and spiritual sustenance.

Degradation of Trinity River fishery habitat was one of the reasons for listing of Southern Oregon/Northern California Coast (SONCC) coho salmon (*Oncorhynchus kisutch*) as threatened under the Endangered Species Act (May 6, 1997, 62 FR 24588).

The 1980 EIS recognized that all factors attributed to salmonid losses must be addressed. Tribal harvest, commercial harvest and sport harvest have been restricted over time. The 1980 EIS also concluded, however, that insufficient streamflows represented the most critical limiting factor and that increasing flows was a necessary first step to the restoration of the Trinity River fisheries. Contemporary legal opinions of the Department considered the ability to increase streamflows in light of the 1955 Act and concluded that section 2 of that Act requires that the instream flow needs of the Trinity Basin must be met first prior to exporting water to the Central Valley (*e.g.*, Memorandum from the Solicitor to Assistant Secretary – Land and Water Resources, *Proposed Contract with Grasslands Water District* (December 7, 1979)).

D. 1981 Andrus Decision

The 1980 EIS did include interim flow recommendations, but also recommended a more complete analysis. Former Secretary of the Interior Cecil D. Andrus considered the findings of the 1980 EIS as well as the statutory and tribal trust responsibilities involved. With respect to the trust obligations of the Department, Secretary Andrus found that:

> the Hupa and Yurok Indians have rights to fish from the Trinity and Klamath Rivers . . . These rights are tribal assets which the Secretary, as trustee, has an obligation to manage for the benefit of the tribes. The Secretary may not abrogate these rights even if the benefit to a portion of the public from such an abrogation would be greater than the loss to the Indians.

Secretarial Issue Document, Trinity River Fishery Mitigation, at 3 (January 1981) (1981 SID). The Secretary also found that the trust obligation "includes both a duty to preserve the trust assets and to make them productive." The Secretary concluded that the statutory and trust obligations of the Department compelled the restoration of the Trinity River anadromous fishery to pre-TRD levels. Therefore, Secretary Andrus directed the Service to complete a 12-year study which would assess the effectiveness of flow and habitat restoration efforts and make recommendations on measures necessary to address the fishery impacts attributable to the TRD consistent with the Department's obligations.

E. Congressional Direction to Address the Impacts

At this same time, Congress also turned to the growing problems facing the Trinity River and its dwindling fishery resources. The first step came in 1980 with the passage of the Trinity River Stream Rectification Act (Pub. L. No. 96-335) which aimed to control sand deposition problems resulting from the degraded Grass Valley Creek watershed, a tributary of the Trinity River, and the inability of the low annual mainstem flows to flush these sediments through the system. In

1984, Congress passed the second, more critical step – the Trinity River Basin Fish and Wildlife Management Act (Pub. L. No. 98-541). The 1984 Act made findings similar to those in the 1980 EIS and recognized that TRD operations substantially reduced instream flows in the Trinity River, resulting in degraded fish habitat and consequently a drastic reduction in anadromous fish populations. The 1984 Act directed the Secretary to develop a management program to restore fish and wildlife populations in the Basin to levels approximating those that existed immediately before TRD construction began. The program would include measures to rehabilitate fish habitats in the mainstem Trinity River and its tributaries below Lewiston Dam, increase the effectiveness of the Trinity River Fish Hatchery, and monitor fish and wildlife populations and the effectiveness of rehabilitation efforts. The program would also include any other activities necessary to achieve the restoration goals. Amendments to the 1984 Act redefined its restoration goals so that the fishery restoration would be measured not only by returning anadromous fish spawners, but also by the ability of dependent tribal and non-tribal fishers to participate fully in the benefits of restoration through meaningful harvest opportunities. (These restoration goals were reaffirmed through enactment of the Trinity River Fish and Wildlife Management Reauthorization Act of 1995, Pub. L. No. 104-143, May 15, 1996).

Congress provided the third step with the passage of the Central Valley Project Improvement Act (CVPIA) in 1992. The CVPIA listed among its purposes the need "to protect, restore, and enhance fish, wildlife, and associated habitats in the Central Valley and Trinity River Basins" and the need "to address impacts of the Central Valley Project on fish, wildlife, and associated habitats." Although the CVPIA includes several provisions related to the TRD, the primary Congressional direction occurs in section 3406(b)(23). Pending completion of the TRFES and implementation of it recommendations, Congress set the minimum flow volume in the Trinity River at not less than 340,000 af based on the supplemental Secretarial Decision signed by former Secretary of the Interior Manuel Lujan in 1991. The Trinity provision of the CVPIA specifically directed the completion of the 12-year study (TRFES) called for by Secretary Andrus "in a manner which insures the development of recommendations, based on the best available scientific data, regarding permanent instream fishery flow requirements and [TRD] operating criteria and procedures for the restoration and maintenance of the Trinity River fishery." Upon concurrence of the Secretary and the Hoopa Valley Tribe, the provision Congressionally mandates the Secretary to implement the recommendations from the study accordingly. That statute also provides that if the secretary and the Hoopa Valley Tribe do not concur, the flows in the Trinity River may be increased by an Act of Congress, appropriate judicial decree, or agreement between the Secretary and the Hoopa Valley Tribe.

F. Trinity River Flow Evaluation Study

Following the 1981 Secretarial Decision, the Service developed a plan of study and began the TRFES. Four annual flow volumes were to be evaluated under the TRFES: 140,000 af, 220,000 af, 287,000 af and 340,000 af. Release schedules for each of the water volumes were to be assessed for their ability to meet criteria necessary to restore and maintain the fishery resources of the Trinity River. The TRFES report was also to recommend specifically what actions should be

continued, eliminated or implemented to mitigate fish population declines attributable to the TRD.

Flow evaluation studies were conducted annually between 1983 and 1994 by Service biologists in Lewiston. Scientists and technicians from several agencies and tribes working under direction of the 1984 Act coordinated with TRFES biologists to implement recommendations developed during the TRFES annual studies.

The Service and Hoopa Valley Tribe released the TRFES in June 1999. Their report concluded that the flow "alternatives" identified for study in the 1981 Secretarial Decision cannot meet the biological and geomorphic habitat requirements necessary to restore naturally produced salmonid populations in the mainstem Trinity River. The TRFES recommended specific annual flow releases, sediment management, and channel rehabilitation to create and sustain a dynamic alluvial channel that will provide the necessary habitat. The Preferred Alternative, as described in the FEIS/EIR and summarized in this ROD, adopts the recommendations contained in the TRFES, is based on the extensive scientific studies contained in the TRFES, and is the most practical and scientifically based restoration strategy.

This ROD represents the culmination of over two decades of efforts aimed at understanding the necessary instream flow and physical habitat restoration requirements in order to restore the Trinity River anadromous fishery. Statutory requirements since 1955, based in large part upon the federal government's trust obligations to the Hoopa Valley and Yurok Tribes, require the restoration and maintenance of the Trinity River anadromous fishery resources to pre-dam levels. It is clear that restoration must provide for a meaningful fishery, not only for the Tribes, but also for commercial, sport, and recreational fishermen. These important resources represent both tribal trust and public treasures from which all should benefit - to restore the faith of our tribal beneficiaries and to improve the economic well-being of the Trinity Basin and North Coast as a whole.

III. NEPA/CEQA Process

NEPA requires federal agencies to analyze and disclose the environmental effects of their proposed actions. To ensure full compliance with NEPA, the Service initiated the environmental review process to develop and assess alternatives aimed at restoring the Trinity River mainstem fishery by publishing a Notice of Intent (NOI) to prepare an EIS in the Federal Register on October 12, 1994 (59 Fed. Reg. 25141). Shortly thereafter, Trinity County initiated the concurrent CEQA process by forwarding a Notice of Preparation (NOP) of an EIR to the State Clearinghouse on November 16, 1994.

The Service and Trinity County served as the designated lead agencies for NEPA and CEQA purposes, respectively, for this joint environmental review because of their particular roles in developing the TRFES and in permitting certain actions in Trinity County. Reclamation and the Hoopa Valley Tribe also served as co-lead agencies because of their respective interests in this

action. In developing this environmental review, the joint lead agencies relied extensively on the participation of thirteen local, state, and federal agencies (either cooperating, responsible, or trustee agencies) as well as involvement by the Yurok and Karuk Tribes. This review also used six technical teams--led by representatives of the Service, Reclamation, Western Area Power Administration (WAPA), U.S. Army Corps of Engineers (Corps), and the Bureau of Land Management (BLM)—to address key issues involved in this decision.

This review provided for significant public involvement throughout the process. Numerous public meetings occurred over the past six years to scope the process; recommend potential alternatives to be evaluated; identify critical issues, including potential environmental impacts from implementing various alternatives and other areas of concern; and to inform the public about the continuing progress for this review. Various issues and concerns identified included: fishery resources, Tribal trust obligations, CVP agricultural as well as municipal and industrial (M&I) water supply and reliability, vegetation and wildlife resources, water quality and in-river temperature, water management, CVP power generation, recreation and recreation economics, socio-economics, land use, Trinity River flooding, aesthetics (related to reservoir drawdown), ocean sport and commercial fishing, and upland watershed rehabilitation.

On October 19, 1999, the Service announced the availability of the DEIS/EIR and the commencement of the public comment period (64 FR 56364). The public comment period included a series of NEPA/CEQA public hearings held in Redding, Sacramento, Eureka, and Weaverville in November and December. Although the public comment period was originally scheduled to end on December 8, 1999, the Service twice extended the time for public comments (64 FR 67584, 64 FR 72357) to January 20, 2000. A substantial number of letters and postcards commenting on the DEIS/EIR were received from 6445 people and organizations (1009 letters and 5436 pre-printed postcards). A list of the commentors and the response of the agencies to the comments were presented the FEIS/EIR. On November 17, 2000 the Service announced the availability of the FEIS/EIR (65 FR 69512). See Appendix A for details of the public involvement process and responses to comments on the FEIS/EIR.

IV. Alternatives

In accordance with NEPA and CEQA, the FEIS/EIR identifies a range of reasonable alternatives, based on public input, scientific information, and professional judgment. The FEIS/EIR examined the affected environment and the environmental consequences for numerous alternatives: 1) No Action Alternative; 2) Maximum Flow Alternative; 3) Flow Evaluation Alternative; 4) Percent Inflow Alternative; 5) Mechanical Restoration Alternative; 6) State Permit Alternative, and the 7) Preferred Alternative. These are described in detail in the FEIS/EIR. In addition, all alternatives were compared to the No Action and Existing Conditions scenarios, as required by NEPA and CEQA, respectively. The FEIS/EIR considered but rejected other alternatives, also described in detail in the FEIS/EIR and summarized below.

No Action Alternative: represents ongoing activities and operations and the anticipated future condition of the affected environment in the year 2020 in the absence of project implementation. Flow releases to the Trinity River under current operations would remain unchanged which are 340,000 af annually.

Maximum Flow Alternative: would use all of the Trinity River inflows above the Trinity Dam to restore the river ecosystem through managed flows with no water exported to the Sacramento River system.

Flow Evaluation Alternative: is based on the recommendations in the TRFES and includes increased variable annual instream flow releases from Lewiston Dam, a coarse sediment introduction program, 47 new channel projects (mechanical channel rehabilitation), and implementation of an adaptive management program.

Percent Inflow Alternative: would approximate natural flow patterns, at a reduced scale, by releasing water into the Trinity River at a proportion of the rate it flows into the Trinity Reservoir.

Mechanical Restoration Alternative: would use the same water management as the No Action Alternative (i.e., 340,000 af), but would include constructing 47 new channel projects, mechanically maintaining these new projects as well as existing projects, dredging 10 pools in the Trinity River mainstem (most likely on an annual basis), and initiating a watershed protection program.

State Permit Alternative: would use the minimum flow levels as provided in the 1955 Act and specified in Reclamation's seven California water permits issued in 1959. Under this alternative, Trinity River instream flows would be reduced from the No Action levels of approximately 340,000 af of water per year to 120,000 af.

Preferred Alternative: consists of the Flow Evaluation Alternative which includes increased variable annual instream flow releases from Lewiston Dam, a coarse sediment introduction program, 47 new channel projects (mechanical channel rehabilitation), and implementation of an adaptive management program. Additionally, this alternative includes a watershed restoration program identical to the watershed protection efforts identified in the Mechanical Restoration Alternative.

Other Alternatives: Other alternatives were suggested in scooping for the draft EIS. Pages 2-35 through 2-42 of the draft EIS described eight alternatives considered but not forwarded for further consideration. The alternatives of harvest management, improving fish passage facilities, trucking fish around the dams, predator control, increased hatchery production, pumped storage, and channel augmentation using Weaver Creek were eliminated because they would not achieve the fishery restoration objectives. The alternative of removing Trinity and Lewiston Dams was

not considered a viable alternative because of the environmental impacts, forgone benefits, and costs associated with dam removal. Other alternatives were suggested in public comments on the draft EIS/EIR and were evaluated in developing the FEIS/EIR. The Sacramento Municipal Utility District (SMUD), provided comments that recommended additional mechanical manipulations and alternative flow schedules. The SMUD alternative was evaluated and analyzed using the same fishery resource model as the other alternatives contained in the FEIS/EIR. As shown in the FEIS/EIR (starting at page D2-37 and also in the specific responses to SMUD's comment letter) the SMUD alternative would require a significant amount of additional annual mechanical restoration in the channel, with associated increased costs, and would not substantially increase natural production above that anticipated under the Mechanical Restoration Alternative. As described in the FEIS/EIR(pages D2-35 through D2-38), the other suggested alternatives were either minor variations of alternatives already examined or would not meet the physical and biological objectives necessary for recovery of the fishery resources of the Trinity River and thus did not warrant further consideration in the FEIS/EIR.

Environmentally Preferred Alternative: The Preferred Alternative has been chosen as the Environmentally Preferred Alternative. The Preferred Alternative will restore the diverse fish habitat necessary to restore the anadromous fishery of the Trinity River. This alternative also causes the least damage to the biological and physical environment and best protects, preserves, and enhances historic, cultural, and natural resources. Implementation of the Preferred Alternative will not jeopardize the continued existence of any listed species under the Endangered Species Act, or destroy or adversely modify the critical habitat for any listed species under the Endangered Species Act. Additionally, the Preferred Alternative also includes a watershed management plan as well as measures to minimize and mitigate impacts (as outlined in section V(G) and Appendix C). For these reasons, the Preferred Alternative is the Environmentally Preferred Alternative.

V. Components of the Decision

For the reasons expressed in this ROD, the Department's agencies are directed, through the Trinity Management Council, to implement the Preferred Alternative as described in the FEIS/EIR and to implement the reasonable and prudent measures described in the NMFS and Service Biological Opinions. The Preferred Alternative incorporates the recommendations developed in the TRFES and evaluated under the Flow Evaluation Alternative, coupled with the additional watershed protection efforts identified in the Mechanical Restoration Alternative. Although the Secretary retains ultimate authority over this program, by this Record of Decision, the Trinity Management Council is established which will guide overall implementation of the management actions of the Implementation Plan.

Reclamation and the Service, as the Secretary's representatives on the Trinity Management Council, will be responsible for assuring that the restoration is carried out in a timely manner and

that progress reports are submitted to the Department and to the Congress. On behalf of the Secretary, Reclamation and the Service should identify sources of funding necessary to implement the restoration program (FEIS/EIR at pages C-16 and C-17). As with all other federal programs, implementation is contingent upon Congress appropriating funds.

The suite of actions which make up the Preferred Alternative is designed to restore the Trinity River mainstem fisheries and avoid or minimize potential adverse effects. Implementation of the fishery restoration program will involve several components that will be implemented over time. The Implementation Plan contained in the FEIS/EIR (FEIS/EIR pages C-1 through C-39) describes in detail the activities which comprise this comprehensive program for Trinity River mainstem fishery restoration and is adopted as part of this decision. Sufficient information exists for implementation of certain actions under this decision, and adjustments may be made to certain elements of the fishery restoration plan based on continuing scientific monitoring and studies called for in the Adaptive Environmental Assessment and Management Program (AEAM). The Trinity Management Council, will consult on these actions with the Hoopa Valley and Yurok Tribes and other responsible Federal, State and local jurisdictions, and private landowners as appropriate. The main elements of this Decision its Implementation Plan are summarized below:

A. Variable Annual Flow Regime

Reclamation will provide annual instream flows below Lewiston Dam according to the recommendations provided in the TRFES and adopted in the FEIS/EIR Preferred Alternative. The total volume of water released from the TRD to the Trinity River will range from approximately 369,000 af to 815,000 af, depending on the annual hydrology (water-year type) determined as of April 1st of each year (see Table 1, Figure 1, and ROD Appendix B). The recommended flow regimes link two essential purposes deemed necessary to restore and maintain the Trinity River's fishery resources: 1) flows to provide physical fish habitat (i.e., appropriate depths and velocities, and suitable temperature regimes for anadromous salmonids), and 2) flows to restore the riverine processes that create and maintain the structural integrity and spatial complexity of the fish habitats. The environmental effects of implementing this flow program have been thoroughly analyzed in the FEIS/EIR; no further environmental compliance is currently anticipated for implementing the flow program. Under this decision and the NMFS and Service biological opinions, Reclamation's Operating Criteria and Procedures for the TRD have been modified to implement the Preferred Alternative's flows (FEIS/EIR pp C1-C7).

Based on subsequent monitoring and studies guided by the Trinity Management Council, the schedule for releasing water on a daily basis, according to that year's hydrology, may be adjusted but the annual flow volumes established in Table 1 may not be changed. Maximum releases from Lewiston Dam will not exceed 6,000 or 8,500 cfs depending upon the completion of specific infrastructure modifications discussed in Section V.E.

Water-year Class	Volume (Acre-feet)	Peak Flow (cfs)	Peak Flow Duration (days)
Critically dry	369,000	1,500	36
Dry	453,000	4,500	5
Normal	647,000	6,000	5
Wet	701,000	8,500	5
Extremely wet	815,000	11,000	5

Table 1. Volume, Peak Flow and Peak Flow Durations for proposed Flow Schedules for Five Water-Year Types

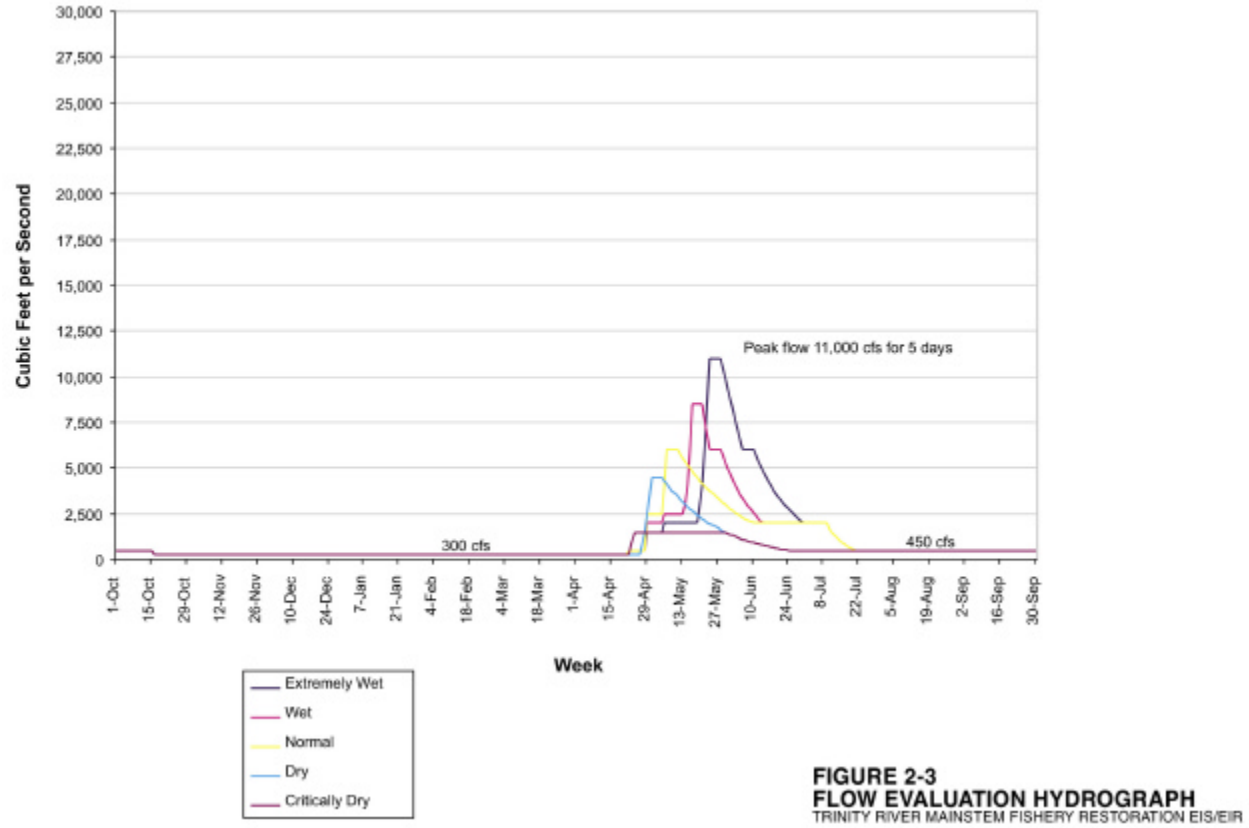

Figure 1. Flow Hydrograph for Five Water-Year Types (taken from DEIS, p. 2-19)

B. Mechanical Channel Rehabilitation

The Trinity Management Council will guide restoration and maintenance of channel morphology characteristics modeled based on pre-dam Trinity River channel morphology characteristics. This

restoration, which will be implemented in phases over time, will require removal of riparian berms at 44 project areas, the establishment of side channel habitat at 3 sites and the use of increased flow releases to maintain habitat and promote the creation of alternate bar sequences. Additional environmental planning and environmental compliance steps will be performed as necessary in order to acquire all the necessary permits and other authorizations prior to implementation of this portion of the Preferred Alternative.

C. Sediment Management

The Trinity Management Council will guide a program to balance the recruitment of coarse and fine sediment of the upper river that has been disrupted by the construction and operation of the TRD. Lewiston and Trinity dams trap all coarse sediment supply above Lewiston (gravel and cobble necessary for spawning and rearing habitat). A gravel supplementation program will be implemented in the reaches below the dam. Restoration of fluvial processes will require continued input of coarse sediment as gravels are moved and redeposited from increased flows creating necessary dynamic habitats. Required coarse sediment introductions are anticipated to average 10,300 cubic yards annually but could range from 0 to 67,000 cubic yards in any one year depending upon the water year type (Table 2). Reclamation will continue operation and maintenance of fine sediment (sand) catchment ponds on Grass Valley Creek to prevent fine sediment from reaching or remaining in the mainstem and degrading spawning and rearing habitat. Additional environmental planning and environmental compliance steps will be performed as necessary to acquire all the necessary permits and other authorizations prior to implementation of this portion of the Preferred Alternative.

Water Year	Coarse Sediment Introduction (yd^3/year)
Extremely Wet	31,000-67,000
Wet	10,000-18,000
Normal	1,800-2,200
Dry	150-250
Critically Dry	0

Table 2. Annual coarse sediment replacement estimates for the Lewiston Dam to Rush Creek Reach. Actual volume will be determined by modeled and measured transport each year.

D. Watershed Restoration

The Trinity Management Council will guide an upslope watershed restoration program to address the problems of excessive sediment input from many of the tributaries of the Trinity River resulting from land use practices. The watershed protection program of the Preferred Alternative includes road maintenance, road rehabilitation and road decommissioning on private and public lands within the Trinity River basin below Lewiston Dam, including the South Fork Trinity River basin. Approximately 80 percent of the lands within the Trinity basin are federally managed of which the USDA Forest Service administers approximately 95 percent and the Bureau of Land Management administers five percent. Of the remaining 20 percent privately-owned land in the basin, approximately half (10 percent of the total) are industrial timberlands, with the remainder being small private holdings. Additional environmental planning and environmental compliance steps will be performed as necessary in order to acquire all the necessary permits and other authorizations prior to implementation of this portion of the Preferred Alternative.

E. Infrastructure Improvement

Since construction of the TRD, human encroachment into the historic flood plain has occurred. Since infrastructure modifications represent a high priority activity for initiating flow changes, Reclamation will take appropriate steps in a timely manner to ensure that affected bridges, houses, and out-buildings are structurally improved or relocated or otherwise addressed before implementing recommended peak releases for Wet or Extremely Wet water years (8,500 and 11,000 cfs, respectively). Additional environmental planning and environmental compliance steps will be performed as necessary to acquire all the necessary permits and other authorizations prior to implementation of this portion of the Preferred Alternative.

F. Adaptive Environmental Assessment and Management Program

The Trinity Management Council will establish and guide implementation of an AEAM Program to monitor the physical and biological results of the implementation plan and guide the refinement of the flow schedules and other activities contained in this Decision/restoration plan to ensure that the ultimate goal of restoring the fishery resources of the Trinity River is achieved. Appendix C of the FEIS/EIR contains a detailed description of the AEAM.

The focus of the AEAM organization is the Trinity Management Council and an AEAM Team consisting of a Technical Modeling and Analysis Group and a Rehabilitation Implementation Group. The organization includes a support staff (AEAM Team) of engineers and scientists charged with assessing the Trinity River fishery restoration progress. The AEAM Team will coordinate independent scientific reviews of the AEAM organization and may recommend management changes based on annual assessments of the evaluation of rehabilitation and flow schedule activities. See FEIS/EIR Appendix pages C-19 though C-29 for a detailed description of the organization and roles and responsibilities of the Trinity Management Council. The Trinity Adaptive Management Working Group, a stake holder group whose participation in the program is described on page C-23 of FEIS/EIR, will be chartered under the Federal Advisory Committee Act

Nothing in this ROD is intended to preclude watershed restoration and monitoring, provided funding is available, below the confluence of the Trinity and Klamath Rivers. Because the TRFES and ROD focus on the Trinity River mainstem and Trinity Basin, watershed restoration and monitoring that benefit Trinity River fisheries below the confluence of the Trinity and Klamath Rivers may be considered by the Trinity Management Council.

G. Measures to Minimize and Mitigate Impacts

Since there may be some short-term impacts resulting from modifying river flows, channel rehabilitation, watershed protection measures, and infrastructure modifications, the Trinity Management Council will guide efforts to minimize or eliminate potential impacts prior to implementation. These are described in detail in the FEIS/EIR, listed in ROD Appendix C, and summarized below.

The reasonable and prudent measures identified in the NMFS and Service Biological Opinions will be implemented in an effort to avoid unauthorized take of listed species on the Trinity River, Sacramento Valley and Delta. The Service will coordinate with the NMFS regarding surveys for threatened coho salmon presence prior to implementation of habitat rehabilitation on the Trinity River. The NMFS and Service will coordinate work windows for these projects, as needed. All permits or other authorizations will be acquired and other environmental compliance requirements will be satisfied, as necessary, prior to initiation of any program activities.

Surveys for nesting northern spotted owls and bald eagles will occur in suitable habitat within a 0.5 mile radius of a project site prior to beginning work activities utilizing motorized equipment or chain saws. If a nesting owl is detected within a 0.25 mile radius, scheduled work activities will not occur from February 1 through July 9; if a nesting eagle is detected within a 0.5 mile radius, scheduled work activities will not occur from January 1 through August 31. Similar surveys will occur for watershed protection and restoration efforts in upland areas.

Measures will be taken to minimize any increased sedimentation/turbidity in the mainstem from mechanical disturbance, such as leaving a small berm at the edge of the channel to trap sediments until all other work is completed. Turbidity and other Clean Water Act standards, as identified by the Water Quality Control Plan for the North Coast Region, will be monitored and maintained. If standards are not met, construction activities will cease until such a time that operations or alternatives can be completed within compliance standards.

Construction of most project sites will involve removal of riparian vegetation at encroached berm areas. Construction of these channel rehabilitation sites, as presented in the FEIS/EIR, will include areas that are re-vegetated with willow, cottonwood and/or other shrub/tree species at more appropriate locations on the floodplains of the rehabilitation sites. Ultimately, natural

revegetation and more proper riparian function will also occur at project sites as flow regime changes are implemented.

The lead agencies have executed a Programmatic Agreement (PA) under Section 106 of the National Historic Preservation Act with the Hoopa Valley Tribe, the State Historic Preservation Officer for California, and the Advisory Council on Historic Preservation. Under the terms of the PA, efforts will be undertaken to identify historic properties that may be affected by actions to be taken under the Preferred Alternative, and measures will be identified and implemented to avoid, minimize, or mitigate potential adverse effects upon those properties.

The segment of the Trinity River between Cedar Flat and Lewiston Dam (river miles 47.5 to 111.9) is a component of the National Wild and Scenic Rivers System ("System"). The primary outstanding remarkable value of this section of the Trinity River is recreational. Mitigation measures intended to address public safety from river flows that are too high or too low will be implemented as part of the Preferred Alternative (see ROD Appendix C).

VI. Rationale for Decision

As expressed above, the guiding principles for this decision emanate from various Congressional mandates as well as the federal government's trust responsibility to the Hoopa Valley and Yurok Indian Tribes. From the inception of the TRD, Congress directed this Department to ensure the preservation and continued propagation of the Trinity River's fishery resources and to divert to the Central Valley only those waters surplus to the needs of the Trinity Basin. With the drastic declines in anadromous fish and associated habitats following the TRD's construction and operations, Congress subsequently passed a series of legislative initiatives directing the Department to determine and implement flows and other measures necessary to restore and maintain these populations to levels which existed prior to the TRD's inception.

These statutory restoration and preservation directives also comport with the Department's trust responsibility to the Hoopa Valley and Yurok Tribes. These Tribes have federally recognized fishing rights which require sufficient water to make their fishing rights meaningful. The Department has a trust obligation not only to protect these trust assets but also to make them productive. Thus, the Department must manage these assets for the benefit of the Tribes so that they can enjoy a meaningful fishery—for ceremonial, subsistence, and commercial purposes. Because of the depressed fishery conditions subsequent to the TRD, however, the Tribes have been increasingly restricted from the enjoyment of their trust resources.

In light of these obligations, the Service, with vital support from the Hoopa Valley Tribe, conducted an extensive scientific effort to determine the appropriate flows and other measures necessary to restore and maintain the Trinity River's anadromous fishery. In section 3406(b)(23) of the CVPIA, Congress sought the final resolution of these issues in order to meet the federal trust responsibility and to meet the goals of prior legislation, calling for the completion of the scientific efforts initiated by Secretary Andrus and for the implementation of recommendations,

based on the best available scientific information, regarding permanent instream fishery flow requirements and TRD operating criteria and procedures necessary for the restoration and maintenance of the Trinity River anadromous fishery. These statutory and trust responsibilities form the basis for the FEIS/EIR's purpose and need for this action—to restore and maintain the natural production of anadromous fish below the TRD.

All alternatives and issues raised during the environmental review process were fully considered and analyzed in making the decision set forth in this ROD. This ROD adopts the analysis contained in the FEIS/EIR and selects the Preferred Alternative as the necessary and appropriate action which best meets the statutory and trust obligations of the Department to restore and maintain the Trinity River's anadromous fishery resources. The following text summarizes the rationale for choosing this alternative and the critical issues considered in making this decision.

The best available scientific information indicates that restoring the attributes associated with a healthy alluvial river—such as alternative bar sequences, effective sediment transport, and dynamic riparian communities—will best achieve the restoration and maintenance of anadromous fish populations in the Trinity River. Restoring these geomorphic attributes will restore the diverse habitats that salmon and steelhead need to survive and successfully reproduce. This will in turn lead to healthier and more sustainable salmonid populations (and other species) in the Trinity River Basin.
Based on the information and analysis in the FEIS/EIR, full implementation of the Preferred Alternative is necessary to restore the diverse fish habitats in the Trinity River below Lewiston Dam. Improved habitat conditions will in turn benefit rearing and juvenile life stages and improve juvenile emigration throughout the Trinity system and will also benefit anadromous species in the lower Klamath River Basin by providing increased juvenile outmigration flows and lower water temperature. These improved habitat conditions are expected to result in greater production and substantial increases in anadromous fish populations. Spawner escapement estimates for chinook and coho salmon and steelhead range from 64-74 percent of the Trinity River Restoration Program (TRRP) goals following implementation of the Preferred Alternative--approximately eight times greater than the estimate for the No Action Alternative. These increases in fish numbers are expected to ultimately result in self-sustaining anadromous fish populations in the Trinity River, providing a meaningful, viable fishery for the Hoopa Valley and Yurok Tribes as well as non-Indian fishing interests along the North Coast. For these reasons and others noted elsewhere, the Preferred Alternative represents the appropriate action necessary to restore and maintain the Trinity River's anadromous fishery in accordance with the Department's statutory and trust responsibilities.

In addition to the statutory and trust obligations imposed on the Department regarding the restoration of the Trinity River's fishery, the FEIS/EIR considered several additional factors critical in making this decision, including: compliance with the Endangered Species Act; continued TRD integration for CVP consumptive water use and power generation; socio-

economic impacts; impacts to other wildlife; flood control; and additional statutory and other considerations.

ESA: Section 7(a) of the Endangered Species Act places an affirmative obligation on federal agencies to take actions that conserve endangered or threatened species, in addition to the general prohibition on federal activities which would jeopardize the continued existence of listed species or would destroy or adversely modify those species' critical habitats. When federal agencies propose actions which may affect a listed species, agencies must consult with either the Service or the NMFS to ensure that the proposed action will comply with the mandates of the ESA. Consistent with these responsibilities, Reclamation and the Service formally consulted with the appropriate agencies on the potential effects of implementing the Preferred Alternative to threatened and endangered fish and wildlife species in the Trinity River basin and the Sacramento River/Delta system in the Central Valley.

The Service's Biological Opinion concluded that implementation of the Preferred Alternative is not likely to jeopardize threatened delta smelt and threatened Sacramento splittail or adversely modify critical habitat for delta smelt. The Service also has concurred with the determination that implementing the Preferred Alternative will not likely adversely affect the bald eagle and northern spotted owl. Incidental take associated with implementation of the Preferred Alternative of the threatened delta smelt and Sacramento splittail may be affected in a manner or extent not analyzed in the March 6, 1995 Biological Opinion on the Long-term Operation of the CVP and SWP; however, a reasonable and prudent measure to minimize the effects of incidental take due to implementation of the Preferred Alternative was developed. Implementation of this measure is non-discretionary.

The NMFS Biological Opinion finds that implementation of the Preferred Alternative is not likely to jeopardize Southern Oregon/Northern California coast (SONCC) coho salmon in the Trinity River, Sacramento River winter-run chinook salmon, Central Valley spring-run chinook salmon, or Central Valley steelhead. The NMFS has also determined that implementation of the Preferred Alternative, as proposed, is not likely to destroy or adversely modify designated critical habitat for these species.

The NMFS does anticipate that SONCC coho salmon habitat adjacent to and downstream of the channel rehabilitation projects associated with the Preferred Alternative may be temporarily degraded during construction. Construction of these projects, which will create a substantial amount of additional suitable habitat, may temporarily displace an unknown number of juvenile coho salmon but is not expected to result in an unauthorized take.

Because implementation of the proposed action is expected to result in substantial increases in coho salmon populations, implementation of the Preferred Alternative is not expected to appreciably reduce the likelihood of both survival and recovery of SONCC coho salmon in the

wild. Similarly, because the expected outcome of implementation of the proposed action is greatly improved fish habitat conditions (including necessary coho salmon habitat), the value of critical habitat for both the survival and recovery of SONCC coho salmon will not be appreciably diminished.

The NMFS does not anticipate that the implementation of the proposed action will result in incidental take of Central Valley spring-run chinook or Central Valley steelhead, but does anticipate the Preferred Alternative will result in a minute increase in the level of Sacramento River winter-run chinook incidentally taken due to elevated water temperature in all years except critically dry years. In critically dry years, Reclamation would be required to reinitiate consultation pursuant to the existing Winter-run CVP-OCAP to develop year-specific temperature control plans. Implementation of reasonable and prudent measures specified in the NMFS BO to minimize the effects of incidental take are non-discretionary and will result in minimizing impacts of incidental take of SONCC coho salmon and Sacramento River winter-run chinook salmon in all years including critically dry years.

As described above, implementing the Preferred Alternative also will entail the development of more specific plans to implement non-flow related recommendations. These project proposals will serve as biological assessments for the proposed actions, providing necessary details about the actions and their impacts on affected listed and candidate species. Project-specific biological opinions will take into account the environmental benefits that accrue from the fishery restoration program. As a result, the Service and NMFS anticipate that implementation of the overall fishery restoration program will streamline the ESA compliance process and, as actions are taken that benefit listed species, will ultimately reduce and, upon recovery of the listed species, eliminate the need for additional ESA compliance requirements.

TRD integration with CVP: The Preferred Alternative provides for the continued operation of the Trinity River Division of the CVP, including the continued export to the Central Valley of a majority of the waters flowing into the TRD (averaging 52%) and the continued generation of power. The Preferred Alternative, however, also conforms to the legal and trust mandates for the restoration and protection of the Trinity fishery which restrict the amount of water authorized for exportation to the Central Valley.

Since full operation of the TRD began in 1964, an average of 74% of the basin's inflow to the TRD (about 988,000 af) has been exported annually. In some years, approximately 90% of the annual inflow was diverted to the Sacramento basin. In recent years (1985-1997), annual exports have decreased to an average of 732,400 af; under the No Action alternative they were assumed to average 870,000 af. Currently, releases to the Trinity River are not less than 340,000 af annually. Under the Preferred Alternative, the TRD would be operated to release additional water to the Trinity River, and the timing of exports to the Central Valley would be shifted to later in the summer to help meet Trinity River instream temperature requirements. The Preferred

Alternative would, on average, increase releases to the Trinity River by 75% above No Action levels. Long-term average water exports to the Central Valley would be 630,000 acre feet, or a reduction compared to the No Action alternative of approximately 240,000 acre feet (28 percent). Dry-period annual exports would be reduced by 160,000 acre feet (30 percent) compared to average dry period exports under the No Action alternative (see Table 3-3 in the DEIS).

Analyses conducted for the FEIS/EIR indicate that compared to the No Action alternative long-term average annual CVP deliveries may decrease by approximately 90,000 acre feet (2 percent), with reductions during the dry period projected to average 160,000 acre feet (4 percent). Annual Delta exports through the Tracy Pumping Plant were modeled to be reduced by 60,000 acre feet (2 percent) over the long-term average and 90,000 acre feet (4 percent) during the dry period. The reduction in available surface water supplies is anticipated to result in increased pumping of groundwater in areas where such pumping is economically viable given land use, crop mix, and groundwater quality. In some areas, the FEIS/EIR anticipated that water users may choose to pump additional groundwater in areas that are in an existing/projected area of overdraft; such additional pumping would be expected to result in localized groundwater elevation declines and land subsidence compared to the No Action alternative. In some areas where additional groundwater pumping is not assumed to be feasible, either because of economic considerations or ordinances which limit additional groundwater extraction, some lands may be fallowed at least on a temporary basis.

Although not the basis for this decision, improvements in water supply reliability to the Central Valley and in particular to south-of-Delta agricultural interests are being addressed in a separate forum. On August 28, 2000, 18 Federal and State of California agencies, including the Department of the Interior, issued a Record of Decision for implementation of the CALFED Program. The CALFED Program was established to develop a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the San Francisco Bay/Sacramento-San Joaquin Delta (Bay-Delta) system. One of the goals of the CALFED Program is to improve the water supply reliability for the State of California's farms and growing cities that draw water from the Delta and its tributaries, including 7 million acres of highly productive farmland.

As part of the CALFED Record of Decision, the CALFED agencies anticipated that implementation of a variety of water management tools called for in the CALFED Program "will result in normal years in an increase to CVP south-of-Delta agricultural water service contractors of 15 percent (or greater) of existing contract totals to 65 to 70 percent." (CALFED ROD at 41). In the course of developing these target water allocations, and consistent with language contained in House Report 106-253, on the Energy and Water Appropriations Bill – Federal Fiscal Year 2000, certain CALFED agencies considered the potential that the Trinity River decision may affect CVP allocation as part of the CALFED Process, and concluded that it will not affect these targeted allocations to CVP south-of-Delta agricultural water service contracts. Ibid.

Implementation of the Preferred Alternative will have some impacts to power generation. The Preferred Alternative minimizes effects to CVP power generation to the extent practicable, while allowing for both fisheries restoration within the mainstem of the Trinity River and meeting Tribal Trust obligations. The total installed CVP capacity of approximately 2000 megawatts equates to four percent of California demand in 1999 and three percent of projected 2010 demand. The Trinity River Division (TRD) accounts for 25 percent of the total CVP installed capacity (approximately 497 megawatts is generated by the TRD), which equates to approximately one percent of current California demand, and less than one percent of projected 2010 demand. Upon full implementation of the Preferred Alternative, average annual CVP power generation would be reduced in the Trinity River Division, would be slightly reduced in the Shasta Division, and would remain approximately the same at Folsom, Nimbus and San Luis Powerplants. The Trinity River FEIS/EIR(using modeling results produced in cooperation with WAPA – see FEIS/EIR page 2-123, Table 3-49) identifies an average potential decrease in capacity of seven MW (compared to the average capacity of 1603 MW under No Action; a percentage change of less than four tenths of one percent of the total power capacity associated with the CVP) attributable to the Preferred Alternative.[1] Modeling simulations in the FEIS/EIR also indicate that the Preferred Alternative would reduce the average long-term energy production of the CVP by 318 GWh, approximately 6 percent, which equates to a reduction in the statewide electrical energy supply of approximately one tenth of one percent as a result of implementing the Preferred Alternative.

Within the larger context of demand for electricity in the State of California, the reduced generating capacity associated with implementation of the Preferred Alternative is minimal when compared to the new generating capacity either under construction or fully approved for construction within the state. As of November 2000, according to the Western Systems Coordinating Council, approximately 3,700 megawatts (which represents more than the total generation capability of the entire CVP) of new powerplants, in the form of six individual projects, are either under construction or have gained full regulatory approval in California. An additional approximate 7,500 megawatts of new powerplants have applications under review, and a further 2,000 megawatts of new powerplants have recently initiated the application process. As additional plants come on line, the CVP's total contribution as a percentage of California's overall demand for electricity will decrease.

The Preferred Alternative includes peak releases of 11,000 cfs in extremely wet years and 8,500 cfs in wet years. Full implementation of the Preferred Alternative will be delayed due to the need to replace bridges and make other infrastructure modifications, which currently limit flows to no greater than 6,000 cfs. This is expected to take at least two years, thus allowing time for

[1] In certain rare circumstances, this decrease may be as high as 85 MW as a result of potential bypass operations, as discussed below.

additional capacity to come on line before the Preferred Alternative can be fully implemented. Until infrastructure modifications can be implemented to increase the capacity of the channel, additional water may be available for power generation in wet and extremely wet years. Rainfall and run-off to support increased reservoir levels and power generation would typically be greater throughout the CVP system in such above-normal precipitation years.

Additionally, operating criteria will be established to allow WAPA to respond to any emergency situations in accordance with their obligations to the North American Electric Reliability Council, including exceptions for responding to various emergency situations consistent with Presidential Memorandum dated August 3, 2000, directing federal agencies to work with California to develop procedures governing the use of backup power generation in power shortage emergencies. These operational criteria are similar to those currently in place at Glen Canyon Dam that were implemented earlier this year.

The analysis contained in the FEIS/EIR shows that the net decrease in the value of CVP power production is estimated to be $5,564,000[2] annually under the Preferred Alternative when compared to the No Action alternative, a 3 percent decrease. When compared to modeled existing conditions, the net decrease in the value of CVP power production was estimated to be approximately $9,029,000 annually. The difference in the value of reduced power generation between the No Action and Existing Conditions, when compared to the Preferred Alternative, is mostly attributed to increased efficiency in deliveries to preference power customers, assumed to occur in the No Action alternative as a result of not renewing Contract 2948-A with PG&E in 2004. The other source of this difference is attributable to changes in delivery schedules of CVP water under the No Action alternative when compared to both Existing Conditions and the Preferred Alternative. High allocation customers would be subject to increases of $1.25 per megawatt-hour in average power cost, or $0.00125 per kilowatt-hour at the retail level. Average customers would likely see increases of $0.21 per megawatt-hour, or $0.00021 per kilowatt-hour at the retail level, as compared to the No Action alternative. Costs to the average customer are estimated at $0.33 per megawatt-hour or $0.00033 per kilowatt-hour, and $3.90 per megawatt-hour or $0.0039 per kilowatt-hour for preference customers when comparing the Preferred Alternative to Existing Conditions.

Historically, Reclamation has occasionally made low level releases at Trinity Dam to assist in meeting downstream water temperature requirements during particularly dry years. During such releases, all of the water that would normally pass through the power turbines is bypassed, and the generators are shut down. Such bypasses have been implemented when storage has dropped below a range of from 750,000 to 1,000,000 af, depending on specific conditions, and have

[2]Output from the CVP is predominately peaking in nature, since the system is energy constrained during adverse water conditions. Generating capacity from the CVP was valued based on the assumption that any change in the CVP's capacity would be offset by the construction of replacement generating capacity of a similar nature such as a combined-cycle combustion turbine.

occurred in the July through October time frame. In modeling such bypass releases, the analysis was conducted on a "worst case" basis. Modeling of the Preferred Alternative indicates that in the 69 year period of record, bypass operations could have occurred in up to 26 months, during the July through October period, generally in critically dry years. Bypass operations could eliminate an average of 85 MW of firm load carrying capacity in any month that bypass operations occur for the July through October period. Applying the replacement capacity value used in the analysis of costs in the EIS/EIR, the net impact associated with the loss of this capacity would be approximately $3,200,000 for the four month period. This additional cost, above existing costs related to implementing the Preferred Alternative, would be incurred in any year with the potential for bypass operations, because such potential eliminates the reliable use of the Trinity Power plant during the four month period. In contrast, modeling of the No-Action and Existing Conditions indicates that in the 69 year period of record, bypass operations could have occurred in up to 38 months, more often than the Preferred Alternative.

In addition, Trinity Public Utilities District power costs could increase as much as $107,000 annually. These increased costs could result in minor cost increases to individual power users. However, Congress recently passed legislation which may offset any potential increased costs to Trinity Public Utilities District by providing $540,000 annually to the Trinity Public Utilities District. Energy and Water Appropriations Act – FY 2001.

It is important to note that the power costs discussed above may be greater (or less) than the costs identified in the NEPA documentation given different assumptions, which are in part driven by the continued uncertainty related to market deregulation and natural gas price fluctuations, but the relative impacts between the alternatives analyzed remain unchanged.

Socio-economic impacts: The Preferred Alternative is intended to minimize adverse economic and social effects across the Trinity River Basin, Lower Klamath River Basin and the Central Valley Basin. The Trinity/Shasta regional economy would be positively affected by increases in spending associated with increases in water-oriented recreation. Socio-economic benefits also occur from the Mendocino Coastal Area northwards, specifically job growth in the commercial fishing and seafood processing sectors. In contrast, the San Francisco Coastal Area, Sacramento Valley, San Joaquin Valley and Tulare Basin showed adverse economic and employment effects as a result of reduced water deliveries to agricultural contractors. The economic sectors most impacted would be miscellaneous retail, retail and wholesale trade, farm machinery and equipment, and cotton production. As discussed above, implementation of the Preferred Alternative is estimated to reduce CVP power generation by approximately 6 percent, resulting in an increase in power costs to CVP power customers.

Impacts to Other Wildlife: Other beneficial impacts to vegetation and wildlife include significant restoration of pre-dam riparian conditions along the Trinity River, increases in suitable habitat for the foothill yellow-legged frog, western pond turtle and the willow flycatcher, and

long-term increases in wetland acreage. However, ground disturbing activities and construction of channel rehabilitation sites may result in loss of vegetation, special-status plant populations, or federal and state listed species. Therefore, site specific environmental reviews will be conducted prior to ground disturbance or construction. If special-status plant populations or federal and state listed species are present, actions shall be taken to avoid effects (*e.g.*, delay construction until after riparian nesting species fledge). In addition, there would be no significant impacts to riparian vegetation, wildlife, and wetlands anticipated in the Lower Klamath River Basin/Coastal Area.

Infrastructure Impacts: Peak releases associated with the Preferred Alternative would increase from 2,000 to 11,000 cfs in May in extremely wet years, on average one out of every eight years. These flows would result in several developed and undeveloped properties being impacted as well as necessitate the replacement of four bridges (Bucktail Bridge, Poker Bar Bridge, Salt Flat Bridge, and Treadwell Bridge). Appropriate infrastructure modifications will be completed to avoid or address any anticipated impacts to property prior to increasing peak flows in wet and extremely wet years, as detailed above.

Additional Statutory and Other Considerations: Implementation of the Preferred Alternative will also comply with all additional pertinent federal and state laws, including the Fish and Wildlife Coordination Act (FWCA), the National Historic Preservation Act (NHPA), the Wild and Scenic Rivers Act, and the Environmental Justice Executive Order 12898. Site-specific environmental reviews and permitting will be conducted and obtained as necessary.

Other Alternatives Considered in the FEIS/EIR: The other alternatives either fail to achieve the restoration and maintenance goals required by the Department's statutory and trust obligations or have other considerations that weigh against their selection. Analyses conducted for the TRFES and the FEIS/EIR as well as recent history provide substantial evidence that the No Action and State Permit alternatives do not meet the purpose and need for this action. Instead, these alternatives would perpetuate and even exacerbate the degradation of available fish habitats to the continued detriment of the Trinity River and its fish stocks.
The analyses also show that the Percent Inflow and Mechanical Restoration alternatives lack the ability to restore and maintain Trinity River anadromous salmonids successfully. Although these alternatives offer marginal benefits for fishery restoration, each fails to address adequately the mechanisms which led to the current plight, *i.e.*, the geomorphic impacts to the riverine environment resulting from severely reduced and relatively static flows from the TRD. The Mechanical Restoration alternative would continue the present minimum flow of 340,000 af from the TRD, a figure which represents the third-lowest flow on record prior to the TRD, and rely on constructing certain channel rehabilitation projects (also included in the Preferred Alternative and the Percent Inflow alternative) and maintaining these sites mechanically (*e.g*., with heavy machinery). Not only have these essentially static and severely reduced flows proven harmful to the Trinity fishery to date, but reliance on perpetual mechanical restoration efforts would also

prove harmful through the continuing physical disturbance of the riverine environment. Conversely, the Preferred Alternative would maintain these improved habitats more naturally through the managed, variable flow regime, which would flush the fine sediments which clog spawning gravels and prevent future riparian encroachment. The Percent Inflow alternative does offer a varied flow regime from the TRD based on the basin's annual hydrology, but this more limited annual flow for Trinity needs (40% of inflow above Lewiston) greatly hinders the ability to prevent continued degradation of the environment in the majority of water years. This likely result is particularly true for dry and critically dry water years—40 percent of the time--in which only 325,000 af or 165,000 af, respectively, would be released to the Trinity River. Thus, neither of these alternatives provides the tools necessary to meet the Department's statutory and trust obligations or to protect and ultimately recover ESA-listed species.

Although the Maximum Flow Alternative scored better than the Preferred Alternative in terms of estimated population increases, the Maximum Flow Alternative would exclude or excessively limit the Department's ability to address the other recognized purposes of the TRD, including water diversions to the CVP and power production in the Trinity Basin. The best available science presently indicates that the Department's statutory and trust obligations can be achieved while still meeting Congressional intent to have the TRD integrated with the CVP to the extent that diversions to the CVP do not impair in-basin needs.

For all of these considerations, particularly the Department's statutory and trust obligations, implementing the Preferred Alternative represents the necessary and appropriate action in order to restore and maintain the Trinity River's anadromous fishery. As expressed above, the statutory directives and trust responsibility require the restoration of a meaningful, viable fishery from which the Hoopa Valley and Yurok Tribes can exercise their federally reserved fishing rights and the non-Indian commercial and sport fishers can also share in the benefits of these efforts. Based on the best available scientific information, this alternative meets these statutory and trust obligations, providing the best means to achieve the restoration objectives while continuing to operate the TRD as an integrated component of the CVP. This alternative is considered to be the environmentally preferable alternative in that this alternative causes the least damage to the biological and physical environment and best protects, preserves, and enhances historic, cultural, and natural resources. Further, by selecting this alternative for implementation with its associated monitoring and mitigation measures, all practicable means to avoid or minimize environmental harm from the alternative selected have been adopted.

VII. Tribal Concurrence

In accordance with CPVIA Section 3406(b)(23)(B), this decision and the underlying recommendations were reviewed with the Hoopa Valley Tribe through the Tribal Chairman and the Tribal Council. By Tribal Resolution # 00-94 dated December 18, 2000, the Hoopa Valley Tribe formally concurred in and agreed with the underlying recommendations and this decision.

_____ _____

Duane Sherman, Sr. Chairman Date
Hoopa Valley Tribal Council

VIII. Secretarial Directive

The Department's agencies are directed to implement this decision as outlined in this Record of Decision, and described in detail in the FEIS/EIR.

_____ _____

Bruce Babbitt Date
Secretary of the Interior

Appendix A: Public Involvement and Responses to comments on the FEIS/EIR
Appendix B: Lewiston Dam Releases to the Trinity River
Appendix C. Measures to Minimize and Mitigate Impacts Associated with Implementation of the Preferred Alternative
Appendix D. Hoopa Valley Tribal Resolution # 00-94

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APPENDIX C

PRESENTATION TO AEAM STAFF
BY DR. CLAIR STALNAKER

Trinity River Restoration Program

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Foundation impacts

- Blocked access to 109 miles of primary habitat for anadromous salmonids
- Forced downstream portion of river to function as headwater habitats
- Changes in fluvial geomorphic processes initiated detrimental changes to remaining habitat downstream of the dam (historic flow variability of 100 ft^3/s to 100,000 ft^3/s reduced to 150-450 ft^3/s year round with most "high" flows < 6,000 ft^3/s)

Basic Premise

- A combination of mechanical alterations and vegetation removal in addition to managed high-flow releases in the spring will promote fluvial processes leading to a new channel form that is expected to provide significantly increased spawning and rearing habitat for anadromous salmonids

General Hypothesis No. 1

- Recreating a complex dynamic alluvial river will increase salmonid habitat quantity and quality
  - A smaller scale dynamic alluvial river can be recreated on a highly regulated river)

General Hypothesis No. 2

- Salmonid smolt survival will improve as a result of enhanced habitat and temperature conditions that increase growth and promote extended smoltification and reduced travel time associated with emigration

Major Conclusions

- A combination of channel rehabilitation, temperature control and timed releases will be necessary to reach restoration goals of at least doubling the Chinook salmon production
- Different environmental accounts are needed for different water supply conditions
- An adaptive environment assessment and management program is needed to efficiently determine annual reservoir release schedules and assess channel and fish population response

Record of Decision (ROD)

- Set the policy for restoring the Trinity River
  - Establishes initial hypotheses of system behavior
  - Specifies total volumes in each of 5 WY types
  - Allows flexibility in future scheduling within fixed annual volume
  - Lays out initial flow schedule based upon best available science (TRFE)
  - Calls for mechanical rehabilitation of the channel
  - Specifies sediment management
- Established new management organization

AEAM Program

- AEAM Program manages restoration by
  - Gathering scientific evidence
  - Testing hypotheses related to:
    - Rehabilitated river channel
    - Managing sediments
    - Designing annual flow release schedules, and
  - Assessing progress toward goals of a dynamic alluvial channel and salmon restoration

Adaptive Environmental Assessment and Management

- The AEAM approach to management relies on teams of scientist, managers, and policy makers jointly identifying and bounding management problems in quantifiable terms

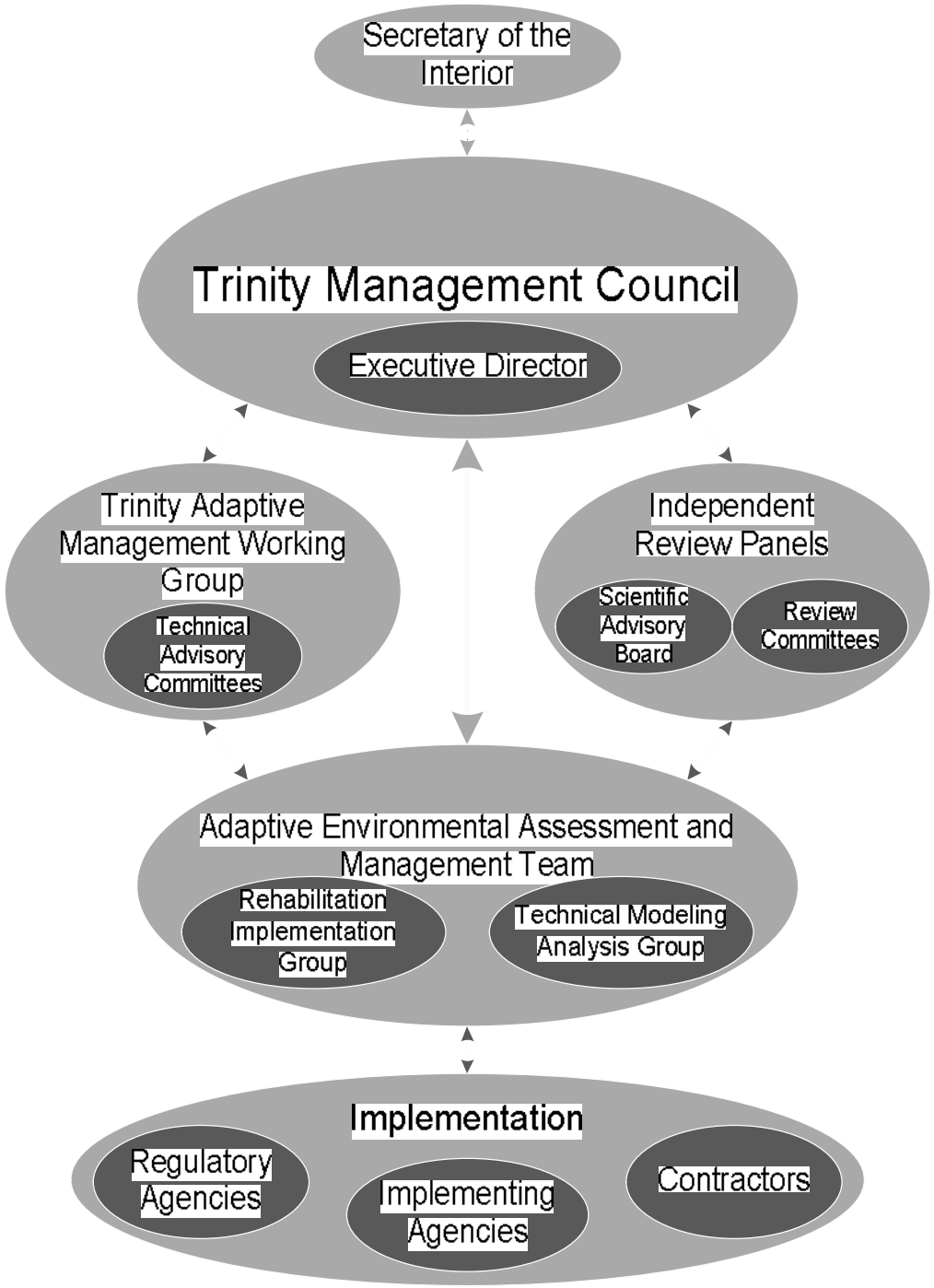
AEAM (cont.)

- An AEAM program combines assessment and management. Most agency and task force structures do not allow both to go on simultaneously.

AEAM (cont.)

- AEAM avoids the pitfall of requiring the costly amassing of more descriptive data before proceeding with policy initiatives. Instead, strategies are adopted as learning experiments in a fluid feedback structure that mandates vigorous self-critiquing and peer review at every stage, such that evaluation and corrective information is disclosed quickly and strategies modified or discontinued accordingly

Organization Structure

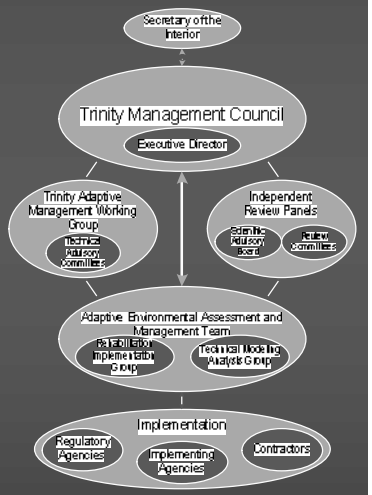


Trinity Management Council (TMC)

- Executive Director

- US Fish & Wildlife Service (Service)
- US Bureau of Reclamation (Reclamation)
- US Forest Service
- Hoopa Valley Tribe (HVT)
- Yurok Tribe (YT)
- State of California
- Trinity County
- NOAA National Marine Fisheries Service

Adaptive Environmental Assessment and Management Team (AEAMT)



- Technical Modeling and Analysis Group (TMAG)
- Rehabilitation Implementation Group (RIG)

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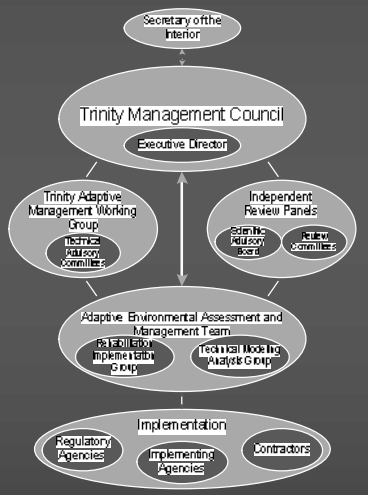
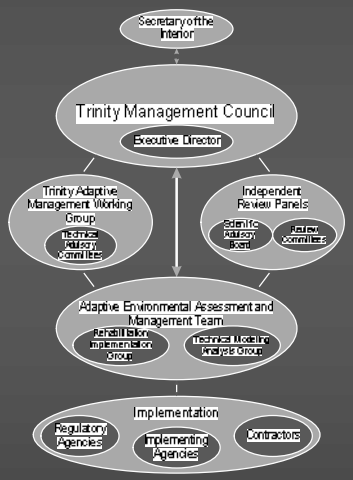
Technical Modeling & Analysis Group (TMAG)



- Fisheries Biology/Population Dynamics
- Fluvial Geomorphology/Hydraulic Engineering
- Riparian Ecology/Wildlife Ecology
- Water Quality/Temperature
- Hill Slope Geomorphology/Watershed Hydrology
- Information Management/Computer Modeling

Rehabilitation Implementation Group (RIG)



- Civil/River Mechanics/Hydraulic Engineering
- Engineering Technician/Surveyor
- Contracting Officer
- Contract Technical Representatives
- Part-time support from:
  - Construction Inspector
  - Construction contract specialist
  - Realty Specialist
  - Field Engineer

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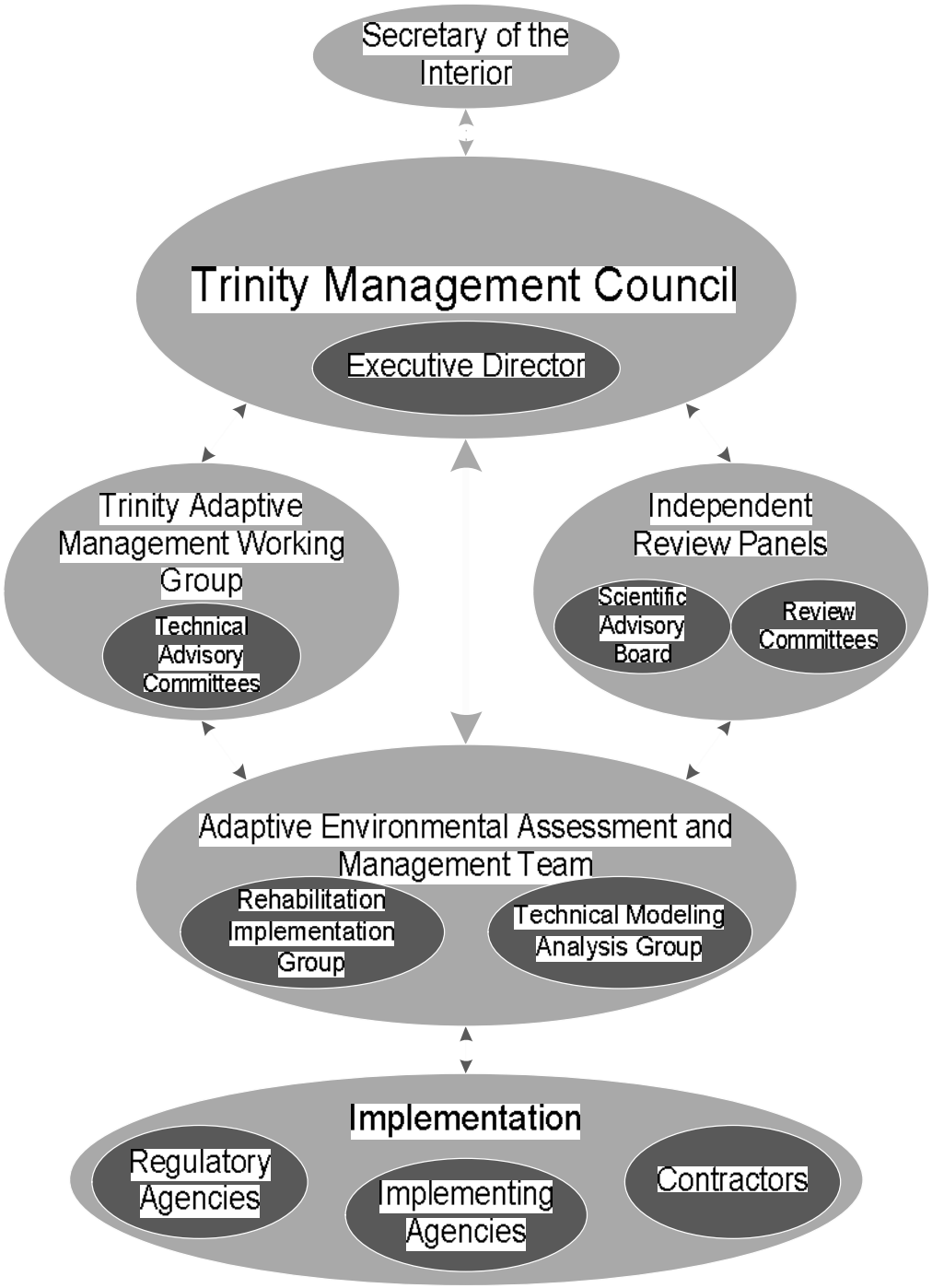
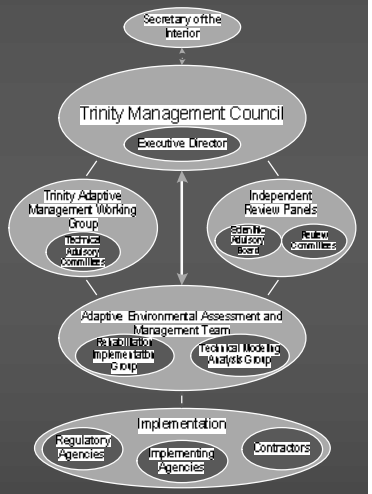
Organization Structure



Trinity Adaptive Management Working Group (TAMWG)



- Stakeholders
  - Recreation
  - Environment
  - Landowners
  - Commercial fishing
  - Sport fishing
  - Timber
  - Power
  - Agriculture
  - Water users Agencies
- Technical Advisory Committees

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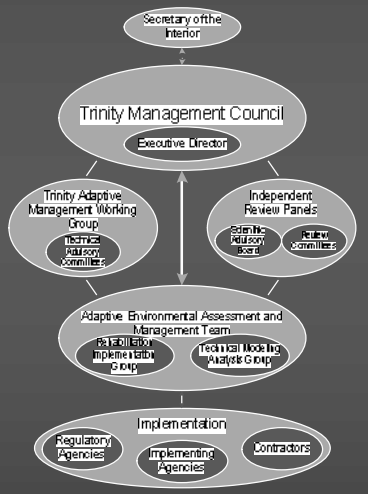
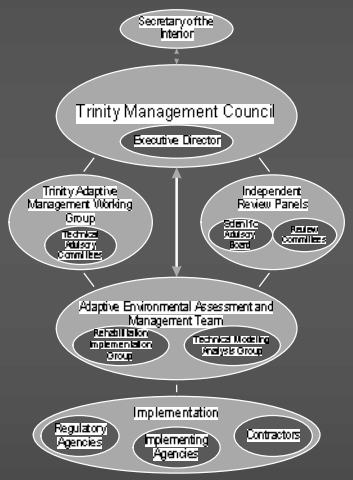
Independent Review Panels

- Scientific Advisory Board
- Review Committees
  - Agencies
  - Tribes
  - Contractors

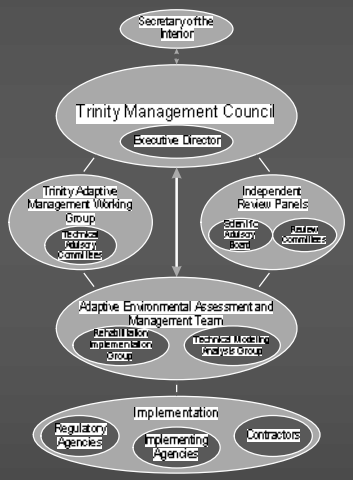


Implementation Process



- Objectives (ROD)
  - e.g. Maximize smolt growth rate and at least double smolt production to achieve escapement goals
- Hypotheses (TRFER)
  - e.g. Factors influencing smolt growth rate, habitat limitations, channel evolution
- Experimental Design(TRRP)
  - e.g. Escapement, Flow Schedule, Evolving Habitat and Channel Shape, Annual Growth and Production, Gravel Augmentation

Process (cont.)



- Integrated Modeling , Prediction (Physical, biological, numerical, empirical)
- Monitoring & Research
  - Baseline, Trends, Process – RFP process
- Assessment,Testing Hypothesis,Comparing Predictions and Monitoring Results
- Adapting, Restate hypothesis

Hypotheses Related Objectives

Date	Release (cfs)	Hydrograph Component	Management Target	Purpose	Benefits
Oct 1 - Oct 15	450	Fall baseflow	≤56°F at confluence of the North Fork Trinity River	Provide optimal holding/spawning temperatures for spring- and fall-run chinook adults	Provide suitable temperatures, reducing pre-spawning mortality and increasing egg viability
Oct 16 - Apr 22	300	Winter baseflow	Provide maximum amount of spawning habitat	Provide best balance of spawning and rearing habitats for all anadromous salmonids in the existing channel	Increase spawning habitat while minimizing dewatering of redds (dewater less than 5% of redds) of salmonids
Apr 22 - Apr 28	500	Spring baseflow	≤ 55.4°F at Weitchpec	Provide optimal temperatures for survival of steelhead smolts	Improve steelhead smolt production
Apr 29 - May 5	1,500	Spring baseflow/ Ascending limb	≤ 55.4°F at Weitchpec	Provide optimal temperatures for survival of steelhead smolts	Improve steelhead smolt production
May 6 - May 19	2,000	Spring baseflow/ Ascending limb	≤ 55.4°F at Weitchpec	Provide optimal temperatures for survival of steelhead smolts	Improve steelhead smolt production Reduce travel time of outmigrating steelhead smolts
May 19 - May 24	2,000 - 11,000	Ascending limb	Reach peak flow	Ramp to peak flow (according to OCAP) safely for human use	Reduce travel time of outmigrating steelhead smolts
May 24 - May 28	11,000	Snowmelt peak	Peak: Mobilize ≥2 D84 deep on flanks of alternate bars (more on lower channel than upper) cleanses gravels and transports all sizes of sediments Initiate channel migration at bank rehabilitation sites Duration: Transport coarse sediment (>8mm) through mainstem at a rate equal to tributary input downstream of Rush Creek Transport fine sediment (< 8mm) through mainstem at a rate greater than tributary input (as measured at Limekiln Gulch Gaging Station)	Reduce fine sediment (< 8mm) storage within surface and subsurface channel bed Increase sinuosity through channel migration Create and maintain alternate bar morphology Create floodplains by bar building and fine sediment deposition Encourage establishment and growth of riparian vegetation on floodplains Scour up to 3 yr old riparian vegetation along low flow channel margins and scour younger plants higher on bar flanks	Increase fry production through improved egg-to-emergence success Increase fry production by creating and maintaining rearing habitat along channel margins Increase smolt production by increasing year-round rearing habitat quality, quantity, and reducing outmigration travel time Increase species and age diversity of riparian vegetation

First Steps…

- The Trinity Management Council in place
- Implementation of the ROD and creation of the AEAM program

Implementation

- Bridge removal/replacement
- Channel rehabilitation and gravel augmentation
- Integrated modeling
- Refined river sampling schemes
- Focusing data collection toward assessment and modeling
- Contract management
- Science based organization guiding adaptive assessment and management

APPENDIX D

TMC SUBCOMMITTEE AND AEAM STAFF MEETING SUMMARY

Trinity River Management Council
Evaluation Subcommittee
Meeting Summary

January 15-16, 2004
Trinity County Library
Weaverville

Background

On January 15th and 16th, 2004 the TMC subcommittee met with AEAM staff to obtain input regarding program status, progress and potential limiting factors inhibiting the Program from achieving the intent of the Implementation Plan contained in the Trinity River 2000 ROD. A comprehensive list of participants appears at the end of this document.

The following three questions were provided to the staff prior to the meeting so that they could prepare to address issues with program progress and challenges:

You've read the Implementation Plan and have heard Clair's presentation of its intent. For your position, please describe your staff duties, percent of time you spend on each task, what changes if any are needed to better achieve the intent of the Implementation Plan for your position.

What are the primary limiting factors inhibiting the Program from achieving the intent of the Implementation Plan and ROD?

Neglecting financial and institutional constraints, and based on your perspective and role in the Program, what recommendations do you have to better achieve these objectives of the Implementation Plan and the ROD?

The meeting was structured into four parts. Initially all staff met with the subcommittee. Clair Stalnaker (USGS-retired) presented the Implementation Plan of the ROD to the group to establish the basis for what the authors of the Implementation Plan envisioned for the Program. After Clair's presentation, each staff member was asked what their primary job duties were and what were the biggest challenges to achieving the objectives of the Implementation Plan. Following the discussion with the entire AEAM staff, separate discussions were held with the Restoration Implementation Group (RIG), the Technical Modeling Analysis Group (TMAG), and the Executive Director. These additional discussions were held to provide an opportunity to focus on activities and issues specific to the RIG, TMAG, and Executive Director.

Issues and concerns raised by AEAM staff during the meetings have been summarized into major issue areas or themes.

1. Program Vision

Trinity River restoration envisioned under the Implementation Plan was not sufficiently transferred to the Trinity River Restoration Program. This had led to conflicting interpretations of the Implementation Plan as well as supporting documents and has hampered integrated restoration program (impacting timelines, priorities, etc).

Strategic planning is necessary to identify broad program objectives and provide the guidance from the TMC.

Insufficient direction has been provided from the TMC as to what they want the AEAM team to focus on. This lack of direction has led to inefficient use of staff time, as they are operating in a reactive mode.

Staff have been unable to focus on programmatic needs, including planning efforts.

The program is shifting from a monitoring program (old restoration program) to one of assessment and management. However, the program still is functioning basically as a monitoring program. Some staff state there are monitoring efforts occurring that are not necessary. Much of the monitoring is similar to what was conducted under the old program.

Project funding is substantially supporting a continuation of previous work. Current information needs may not be met through these projects.

Due to the lack of a permanent decision on instream flow releases there is some hesitancy for commitment to restoration efforts from partner agencies, especially in dealing with permitting issues.

AEAM team perceives resistance from partner (TMC and TAMWG) agencies and these agencies need to actively support the program.

2. Implementation Constraints (administrative/process)

Regulatory

Implementation of infrastructure modifications, channel rehabilitation, and gravel supplementation requires a CEQA lead agency. Presently, CEQA leadership is insufficient.

Need TMC guidance as it pertains to permitting issue. Permitting issues associated with infrastructure modifications, channel rehabilitation, and gravel supplementation require careful coordination with regulatory agencies including: FEMA, State Water Quality Control Board, California Department of Fish and Game, Corps of Engineers, NOAA-Fisheries and others. As the rehabilitation and science projects are improving environmental conditions, permitting should be planned strategically in support of early implementation.

Channel Rehabilitation

Twenty-four rehab site projects in three years is too optimistic a schedule. Staff are not on that schedule right now. No construction has yet begun. Under the current regulatory/permitting constraints it will take 10-12 years to meet this target. Under an accelerated effort, staff could put together a plan for getting 8 sites done by May 2006.

AEAM team has not been able to start implementing channel restoration because of bridges.

Focusing channel rehabilitation efforts on areas below Canyon Creek has thus far avoided some concerns about uncertainty of high flows. However this reach may not be the most important area in which to construct rehab sites.

AEAM team needs to be setting up the floodplain for high flows. Cannot release high flows until these are dealt with. We have yet to deal with floodplain infrastructure such as driveways, roads, and outbuildings that have to be addressed. Staff need to deal with the public/landowners on a case-by-case basis.

Intent of program was to have TMAG provide direction to RIG concerning channel rehabilitation activities (sites, design criteria, prioritization, etc.) but this has not occurred.

The AEAM team desires direction from the TMC as to the level of design necessary for the channel rehabilitation projects. Level of design detail necessary for the restoration sites has yet to be established. Competing views on this are slowing progress. This relates to leadership on rehabilitation site construction projects, interaction between the RIG and TMAG staff, and has permitting implications. Concern was expressed that the RIG is moving forward without input/direction from the TMAG – but they must move forward with implementation of rehabilitation activities and cannot wait for the TMAG to get its assessment and monitoring program established.

There is a narrow window of opportunity for implementing construction activities along the river. There are conflicting elements (flow release scheduling, bridge construction, gravel introduction, etc.) which complicates issues. Need to look for ways to optimize these opportunities.

Sources of large volumes of gravel need to be identified. Gravel supplies must be sufficient to support habitat rehabilitation and sediment management projects.

Science Based Assessment Program

There appears to be little urgency in development of the modeling and assessment aspect of the program. Instead, this has been displaced by need to support contract management and bridge construction activities. With little time devoted to this element, the science program has advanced little. There are conflicting views within the office regarding the priority of science program development versus contracting and bridge construction.

Capping of flow releases by federal judge has delayed need for science program. This is the case because most modeling and assessment activities will only take place once rehab sites have been built, and have begun to receive wet year high flow releases.

An effective assessment program has yet to be established. Staff need clear guidance as to what information is needed. This would be used to direct funding toward priority monitoring/assessment projects.

Program resources are insufficient to meet modeling and analysis needs. TMAG staff resources have been directed away from the science program to support contracting and bridge construction. Funding for modeling and assessment activities is limited, as funding has for the most part supported ongoing monitoring projects.

A contract for assistance in developing the science framework contract is in place. Staff are expecting to have an effective science program in place by WY 2006.

Flow Management

A formal planning process has yet to be developed. Flow management decisions (spring and fall flows) were made in WY 2003 without sufficient time to ensure that monitoring was in place to fully assess management actions. To be effective, modeling and assessment must be incorporated to annual flow planning.

3. Program Structure and Coordination

Internal

Coordination of TMAG and RIG activities has been a challenge. Roles and responsibilities are understood differently by various individuals. There are competing visions of priorities, and how the teams are to interact.

In reference to channel rehabilitation project development, integration between the RIG and TMAG has been a challenge. While there was substantial interaction of staff during the design of the Hocker Flat restoration site, individual responsibilities of participants were not clearly established.

The annual RFP process has not been driven by a clear set of priorities. Information needs associated with the science program must first be identified, and then receive adequate funding.

Information transfer needs to be improved. Important information is not being shared among staff, or among restoration program components such as TMC, TAMWG, and AEAM staff.

External Issues

AEAM staff needs to access data that has been collected over the years, and is currently being collected, to support science program as well as rehabilitation site design. Some

information is difficult or impossible to access. In some cases, required reports have yet to be completed. In other cases, data have yet to be transferred to the AEAM staff.

Ability of TMC to meet its responsibilities is limited, as meetings are too infrequent. One-day meetings do not provide adequate time for the varied and complex issues confronting the program.

Technical discussions at TMC and TAMWG meetings are in some instances insufficient.

Technically complex subjects do not lend themselves easily to discussion and action by these bodies.

4. Staffing Constraints/needs

General Office

Identified need for:

- outreach coordinator
- GIS/AutoCAD position
- data management position

RIG

Identified need for:

- additional engineer

TMAG

Identified need for:

- 2-3 contracting/agreement support staff (to free up staff for science program development)
- fish biologist
- wildlife/riparian biologist
- data management position

5. Other

Individual, enclosed offices would be much better than existing facilities (cubicles), as distractions are severe.

Phone system provides ineffective conference call capabilities.

A library needs to be established.

Those in attendance - January 15-16, 2004:

Bureau of Reclamation
Rod Wittler
Russell Smith

California Department of Water Resources
Curtis Anderson

County of Trinity
Janet Clements

Hoopa Valley Tribe
Robert Franklin
George Kautsky
Scott McBain

TAMWG
Richard Lorenz
Tom Weseloh

Trinity River Restoration Program
Doug Schleusner
Ed Solbos
Daryl Peterson
Lori Kliefgen
Brandt Gutermuth
Noelyn Habana
Bob Sullivan
Rich Miller
Andreas Krause
Deanna Jackson

U.S. Fish and Wildlife Service Office
Joe Polos

USGS (Retired)
Clair Stalnaker

Yurok Tribe
Tim Hayden