Review of CALFED Ecosystem Restoration Program Proposal
Scientific and Technical Review

Proposal 2001-K220-4

Proposal Title: Reintroduction of Native Salmonids in Central Valley Headwaters: Bioengineering Requirements and Social Acceptability

Summary of the Proposal

The proposal evaluates the bioengineering and social acceptability of reintroducing steelhead and spring-run chinook into watershed areas upstream of major Central Valley Reservoirs (called Valley rim dams). The approach is based upon the fact that the great majority of the spawning and rearing habitat necessary for steelhead and spring-run chinook to complete early life history stages is present upstream of major reservoirs ringing the Central Valley. The proposal also recognizes that while modified temperature regimes in the rivers below the major dams may provide some amount of suitable spawning and rearing habitat for salmon and steelhead and that removal of small dams in the smaller tributaries can increase the amount of available habitat, that overall the amount of habitat provided remains small compared to what was once available upstream of the large reservoirs. The conclusion is drawn from these facts that without substantially increasing the amount of spawning and rearing habitat for steelhead and spring-run chinook, it will not be possible to recover their populations resulting in continuing water management conflicts in the Central Valley and the Sacramento-San Joaquin Delta. This proposal uses a three stage analysis: 1) examine previous studies of fish passage around Valley rim dams and around major dams in the Pacific Northwest; 2) conduct a screening analysis on 11 rivers with rim dams to identify their relative potential for reintroduction, and 3) select three dams based upon the screening analysis results for further scrutiny to determine the feasibility of headwater reintroductions to recover wild populations of steelhead and spring-run chinook.

1. Scientific Merit

1a. Clearly State Objectives and Hypotheses

The objectives are clearly stated and the hypotheses are sound. It is a well-documented fact that most of the historic spawning and rearing habitat that supported Central Valley steelhead and spring-run chinook salmon is located upstream of major Central Valley Reservoirs. It seems logical that to recover wild populations of spring-run chinook and steelhead an overall increase in spawning and rearing habitat is necessary.

Five hypotheses are presented in the proposal:
1. Significant amounts suitable quality habitat is present upstream of the rim dams that would meet spring-run chinook and steelhead early life history stage requirements.

2. Public ownership of areas potentially supporting these species is particularly valuable.
3. There are feasible engineering solutions to facilitate up and downstream passage.
4. Reintroductions of target species to these areas would substantially contribute to recovery of naturally reproducing populations.
5. It is feasible to conduct a systematic analysis and planning process to undertake a cost effective pilot project.

The quality of the information required to address each hypothesis varies. There is too much detail in the information collected on available habitat for this level analysis under Hypothesis 1. For instance there does not seem to be a need to collect data on the surface area of spawning beds. Merely knowing of the presence and location of spawning areas is all that is needed at this level.

For Hypothesis 2, knowing that various public agencies are managing portions of these upper watersheds is of value. However, until other feasibility questions are addressed it seems premature to expend effort to delineate how much ownership each agency has.

The information needed to test Hypothesis 3 is vague. Reviews of fish passage solutions implemented in other regions should be well-known to the investigators based upon their qualifications. Not included in this statement of the information required is an assessment of the operations of the reservoir systems or of water or power supply dams located upstream of the major rim dams. This is identified later in the proposal.

The information to test Hypothesis 4 is derived from the habitat information acquired to test Hypothesis 1 which is then incorporated into a salmon and/or steelhead population model, including some factor for passage mortality and then compared to existing production estimates. This description is missing several key pieces of information.

The information required to test Hypothesis 5 is not provided. This is a complex task and the proposal would benefit from better discourse on this Hypothesis.

1b. Sound approach (Conceptual model, study design, methods, analysis and interpretation)

The conceptual model presented in the proposal is pretty straightforward. Central Valley steelhead and spring-run chinook salmon populations have been greatly depressed due to the loss of upstream habitat. Providing access to and from these watershed areas will assist in rebuilding these populations. The causal mechanism is one of reduced spawning and rearing habitat limiting the production of outmigrating juvenile fish. The conceptual model recognizes the roles played by diminished habitat quality in reaches downstream of major reservoirs, entrainment losses and problems associated with altered flow regimes and recognizes that these are being addressed by other CalFed restoration actions. The conceptual model described in the second paragraph on page 4 references Figure 1 which was not included my packet.

The project is a research and planning project and the core of the approach is set forth in Figure 5. The approach is sound and contains a well-thought out approach incorporating the use of an Advisory Committee to direct the approach and documenting data collection and assessment methods. I am confused somewhat by the study design. Task 3C, Final Study Design occurs in month 10 of the project after stakeholder interviews have been evaluated. However tasks 3d through 3l are already defined and laid in the proposal. How will this study design change as a result of task 3c?

This proposal, by its nature, does not fit well into the Adaptive Management approach and the text addressing this attribute is vague and confusing, perhaps because some of the Figures were not included. For instance, it is not clear what the Healey ladder principles are, but I assume it does not relate to fish passage. The proposal makes an effort to incorporate new information along the way.

The type of project is not a type applicable for a monitoring approach.

This proposal justifies its selection as Targeted Research. There is great uncertainty regarding the restoration value of providing fish passage over any given Central Valley Reservoir.

2. Adequacy of information assessment and reporting plans.

The process as outlined in the proposal is well-documented and would result in interim and final reports documenting the process taken, the information evaluated and any basis for recommendations coming out of this process. Source information is identified (GIS layers, interpretation of air photos, agency contacts). However the extensive data assessments necessary are only described in general. There is no description of data collection protocols, QA/QC procedures or data analysis procedures except to defer to the experience of the proposal team. Handling and data storage is described and expected products are listed.

Two comments on the assessment process. There may be an over-emphasis on fish passage when more substantial issues might be controlling possible reintroductions. There was no assessment of the economic cost or a cost/benefit analysis of the resource values gained. I believe this is a very important element because the direct and indirect costs of providing fish passage could be substantial.

3. Technical Feasibility

The approach appears feasible and can be conducted within the timeframe of the proposed work. Some of the comparisons to Columbia River issues might be questioned. because there are differences between fish passage in the Columbia River system compared to Central Valley Reservoirs. Flows are much more seasonally variable and more is stored and less released downstream compared to Columbia River dams. Few, if any, reservoirs have surface releases, except during flood events. Central Valley reservoirs are operated primarily for water supply and flood control, and secondarily

generate electricity. Many of the watersheds upstream of the Valley rim reservoirs have numerous dams and flow regulation that would also have to be addressed.

Unless there are drastic changes to upstream watersheds, there should be no reason to expect that weather related events would alter the schedule. The only contigency might be in task 3c, Final Study Design. As with all stakeholder processes, unless the schedule is driven by an aggressive project manager, it will likely occur at a slower pace than conceived.

4. Qualifications

The project team appears well-qualified to conduct the proposed work. Harza has not been in California that long, and there may be a need to supplement their knowledge of the 11 river systems with some local knowledge, but I would expect that PCLF team members as well as Mr. Hashagen should be able to fill that need.

Issues and comments that have not fitted into above categories.

The overall cost for this proposal seems high and it might be possible to focus the effort on what is already known about some of the rivers that are better candidates than others. The proposal could select two or three watersheds to be quickly identified as candidates (the Merced and American Rivers come immediately to mind) eliminating a lot of data gathering and assessing. In this way, a pilot project could be on the ground earlier. The remaining rivers could then be evaluated.

There are presently no other stakeholders or interest groups involved with this proposal, although the proposal notes they are seeking others. As proposed, the organization of the team demonstrates it is mostly a Harza project with the assistance of PCLF and Ken Hashagen.

Reintroducing steelhead and spring-run chinook to upper watersheds would not eliminate ongoing conflicts in water management within the state, but may acerbate problems with water management in those reintroduced watersheds as well as downstream.

Overall Evaluation. GOOD. The proposal, in general is a good approach, but it has a few deficiencies.