



IN REPLY REFER TO:

United States Department of the Interior

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BUREAU OF RECLAMATION

Glen Canyon Environmental Studies
P.O. Box 22459
Flagstaff, Arizona 86002-2459

SEP 04 1996

August 30, 1996

Mr. Lester Snow
CALFED Bay-Delta Program
1416 Ninth Street
Suite 1155
Sacramento, CA 95814

Dear Mr. Snow:

It was a pleasure to meet with your staff and brief the CALFED Ecosystem Restoration Working Group on August 28th. I felt that the discussion was very beneficial and I hope that our discussion of the Glen Canyon Environmental Studies lessons learned was beneficial. The development of a workable and successful Adaptive Management Program must progress from the concept stage to implementation through a series of definitive steps. From my brief exposure to the Ecosystem Restoration Work Group it appears that you have many of the pieces necessary to make a successful run at Adaptive Management.

There were several specific elements that you may wish to take into consideration.

1. Two Specific Elements/Processes. To be successful, adaptive management programs must have two complementary processes going on concurrently. The first is the administrative activities which include the FACA group and the development of specific goals and objectives. The second process is the scientific. Without a scientifically credible monitoring and research program it will be impossible to ascertain if your adaptive management activities are actually making any difference.
2. Scientific Credibility. In our efforts on the Colorado River scientific information and data were essential to address specific resource concerns. To accomplish this we found it important to hire an outside Senior Scientist that could serve to assist our office in making decisions regarding scientific process and priority. A senior scientist coupled with outside peer review of the scientific process and individual programs has assisted us in reducing the risk of doing science that is not supportable or is necessary.
3. Scientific Information Management. To get over the hurdle of "their data" vs. "our data" it is best to have a centralized scientific information management system established, with defined

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metadata standards, that provide for a common spot for all scientific information to be disseminated from. Specific caveats on publication and use can be attached to preliminary data to protect it from wrong use is possible. A web site for dissemination of information and a consolidated Geographic Information System data base will save you time and money.

4. **Assurances and Indicators.** The development of specific assurances and/or indicators of ecosystem change (+ or -) is necessary. The indicators should include critical ecosystem elements (i.e. endangered species, water quality) and representative ecosystem elements and processes. Each indicator should have associated with it a set of thresholds or boundaries by which to gauge progress. A variety of approaches exist to develop these indices or assurances. This field is well documented in risk assessment protocols.

It is important to realize that ecosystems are healthy when they oscillate within a dynamic equilibrium. The challenge for the biologists and resource managers is to determine for the critical elements of the ecosystem how that dynamic equilibrium functions for the individual resources and the specific thresholds for the critical and representative components. Once those thresholds are determined, through an ecosystem approach, then an adaptive management approach that takes into consideration those limits can be designed and implemented. A scientific/ecological understanding of ecosystem function is imperative to get to this point.

5. **Right Tool for the Right Place.** Adaptive Management is not a panacea. The process, actions and feedback (follow up) are essential if Adaptive Management is to move from the concept stage to the implementation stage. The implementation of specific management actions should be viewed as experiments along with the scientific work. To maximize management and ecosystem restoration actions, clearly defined objectives/hypotheses must be developed, articulated and followed through on. Otherwise overlap of results may make the results uninterpretable from background actions and mask true relationships.

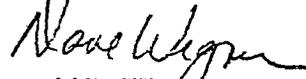
6. **Communication and Process.** This is an area that your group seems to be have well in control. Continual meetings and dissemination of the process and meeting information to the stakeholders is essential.

7. **Linkage to other Drivers.** In my experience there are three primary drivers in dealing with water management issues. Legal mandates, ecosystem requirements and management actions. These three components must be thoroughly understood, developed and process identified before meaningful and long lasting actions can occur. Management actions should be linked to legal requirements and to ecosystem needs.

8. **Coordination with Other Processes.** It was informative to listen to the discussion on the Sierra Project upstream and up slope from the CALFED efforts. I would suggest that you develop a linkage to their information bases and to the CVPIA actions if you have not already done so. Understanding processes and controls upstream can become common drivers to the solution to downstream concerns.

Thanks for inviting me out to give you some of my perspectives. The program at Glen Canyon Dam has provided an opportunity to test and evaluate different options for management of a water system. We have dealt with a more controllable process but similar problems. The lessons learned from our efforts may help you avoid some of the speed bumps that we had in developing the Adaptive Management Program for Glen Canyon Dam and the linkages to the science programs. Please let me know if there is anything else I can do. Regards.

Sincerely,



David L. Wegner
Glen Canyon Environmental Studies

cc. Mr. Roger Patterson, U.S. Bureau of Reclamation, Mid-Pacific Regional Director,
Sacramento, CA