

**SCIENTIFIC REVIEW PANEL
OCTOBER 1997
KEY POINTS AND RECOMMENDATIONS**

A) **In revising the ERPP, CALFED should clearly state whether the goal of the project is restoration or rehabilitation and name the document accurately.** The term ecosystem restoration, as commonly used by ecologists, involves reverting to the extent possible to historic conditions. Another option, and perhaps a more realistic one, is to rehabilitate the ecosystem. This could involve improving habitat for native and exotic species. The ecosystem enhancement activities that encourage exotic fish species constitute rehabilitation and not restoration. The decision to restore or rehabilitate need not be made on a system-wide level – it could be made for individual watersheds or ecological zones. One example of this choice would be to restore diked wetlands to tidal marsh downstream (restoration) as opposed to creating many impoundments upstream (such as rice fields) for upstream waterfowl habitat (rehabilitation).

This distinction between “rehabilitation” and “restoration” is one among several examples of the need for refining the use of phrases and terms in the ERPP, as indicated at other points in this summary report.

B) **Simplify and focus the presentation of the program and its goals on the basis of conceptual models.** The goals should be explicit, quantifiable, and attainable. The panel agrees with CALFED’s tiering approach. The use of conceptual models will be essential to determine the allocation of effort to each tier. However, a coherent defense of the tiering decision, based on ecological and other policy arguments still needs to be articulated to explain the approach to stakeholders.

C) **From the outset, the Program should embed outside scientific expertise in the adaptive management process.** This requires continuous involvement of independent science in the formulation and implementation of the ERPP. Involvement should include: 1) reviewing the rationale, methods, results, and analyses; 2) developing and reviewing recommendations and funding proposals; and 3) pointing out new opportunities. Later portions of this report provide additional guidance on how to accomplish this involvement.

D) **In order to utilize science as a basis for the adaptive management system, there is a need for the development and use of models of physical and biotic ecosystem processes with links to key biotic components.** There are several kinds of models that may be useful in the ERPP. Some are large scale, qualitative, conceptual and concerned with expressing ecosystem operation. An example of such a model is found in the U.S. Forest Service’s Northwest Forest Plan. A second type is a more focused model, which may or may not be quantitative, that addresses selected aspects of ecosystem operation. It should present hypotheses that can be tested through measurements and experiments. A third type of model is a quantitative

simulation which can be useful for making predictions. As an example of the second type of model, the panel developed a sample qualitative input-output model which can be quantified as data are obtained.

E) The ERPP report wisely promises that the program will involve an adaptive management framework incorporating decisions that are based incrementally in scientific analysis, hypothesis testing, and monitoring. Therefore the monitoring component of the adaptive management framework should be developed from testable hypotheses. Information from monitoring should guide management of resources in the following manner: 1) The program would propose a management action to improve the ecosystem; 2) Managers would formulate alternative hypotheses that describe the outcomes of the management action; 3) The action would be conducted as an experiment, and 4) Results would be monitored by gathering data to determine which alternatives are most plausible. The panel acknowledges that not all management actions can be structured as experiments, but recommends that this method be applied wherever practicable.

F) The recommendations the panel has made above will require continual interaction of agency managers, agency scientists, and independent scientists. Part of this interaction should entail the creation of a standing science body, a scientific and technical advisory board, composed of agency scientists, stakeholder scientists, and scientists independent of the program. The body would facilitate the introduction of science into long-term management. The panel notes that other efforts of this kind and scale have failed due to the lack of independent scientific review. Activities to be carried out by the science body would include generating and reviewing hypotheses, formulating monitoring schemes, and reviewing and interpreting data. Another function of this body could be to resolve technical conflicts over data, analyses, interpretations, and conclusions. Designing the terms of reference and modes of operation for such a body could involve another round of review and discussions between this panel and CALFED staff.