

Description of CALFED Ecosystem Restoration Strategy

Ecosystem Restoration Strategic Plan

The Strategic Plan is an integrated planning, scientific, and adaptive management framework by which to successfully implement and evaluate restoration of the large and complex Bay-Delta ecosystem. The plan will define the goals and performance standards for a rehabilitated ecosystem, the actions/projects to achieve the goals, and a process to monitor the health of the ecosystem and the effectiveness of the actions in improving the ecosystem.

The current draft of this document includes four goals which define success of the program. The goals are:

- A. Achieve recovery of the listed native species dependent on the Delta and Suisun Bay, support recovery of listed native species in the Bay-Delta estuary and its watershed, and provide for continued conservation of currently unlisted species.
- B. Rehabilitate the natural capacity of the Bay-Delta estuary and its watershed to support, with minimal ongoing human maintenance, native aquatic and associated terrestrial biological communities.
- C. Maintain and enhance populations of selected species for safe consumption and sustainable commercial and recreational harvest, consistent with goals A and B.
- D. Protect or restore a range of key, functional habitat types for biodiversity, scientific research, and other public values.

These goals are what we want to accomplish through ecosystem restoration. To further quantify these goals, there is a need to develop ecosystem performance standards (quantifiable objectives) which are the quantifiable end points of what we would like to accomplish for ecosystem recovery. Indicators of ecological health (performance indicators) are the things that are measured to determine if the performance standards have been met.

Indicators of Ecological Health

Indicators of ecological health are being developed to measure the ecological integrity of the Bay-Delta system. Indicators are the specific measures which determine whether the performance standards have been met. Indicators for the CALFED Program are being developed by a team of agency and stakeholder experts. The first step in indicator identification is development of conceptual ecosystem models. These conceptual models show the cause and effect relationships between different parts of the ecosystem. For example, they show how streamflows, riparian habitat, nutrients, and water temperature interact to affect species such as

salmon populations. These characteristics of the ecosystem identified in the conceptual models are then further defined and grouped in an ecosystem classification typology. The typology identifies the component pieces of the ecosystem for which specific indicators can be identified. Examples of indicators could include an index of the amount, quality, and distribution of habitat types, measurements of listed species, or some measure of the number of exotic species.

Ecosystem Performance Standards

Like individual projects, there is a need to develop performance standards to measure success for the entire CALFED ecosystem restoration program. We are developing ecosystem performance standards to quantify the four goals for ecosystem recovery. Through the development of the Strategic Plan, a team of independent scientists are working with agency and stakeholder experts to quantify these performance standards.

Monitoring and Assessment

A great deal of research and monitoring has occurred over the last 20 years that will form the basis for developing the performance standards and indicators of ecological health for the ecosystem restoration program. For example, the goals addressing recovery of species populations (A and B) have ongoing monitoring efforts in place. For many species, existing recovery plans identify the population recovery levels (performance standards) which are being considered in the CALFED Program. For the other goals additional work is needed to broaden the current monitoring efforts to ensure that all indicators are being adequately assessed and that the appropriate research is being undertaken to evaluate the effectiveness of restoration projects. CALFED is in the process of developing a comprehensive monitoring and evaluation program that will build on existing monitoring efforts to meet these new needs.

Figure 1.

Measuring Performance: Example

Ecosystem Restoration Goal A

Achieve recovery of the listed native species dependent on the Delta

Ecosystem Performance Standard

Recover spring-run chinook salmon to target population level

Indicators of Ecological Health

*Number of returning spawners
Quantity/quality of spawning gravels
Water temperature
Number of outmigrants
Timing of outmigration*

Ecosystem Monitoring

Project Effectiveness Objective

Reduce migration delays at Gorrill Dam

Project Implementation Monitoring

Satisfactory completion of construction