

Water Supply Reliability Objectives

The mission of the CALFED Bay-Delta Program is to develop a long-term comprehensive plan that will restore ecological health and improve water management for beneficial uses of the Bay-Delta system. To fulfill this mission, CALFED focused on solving problems in four resource areas; water quality, ecosystem quality, water supply reliability, and levee system integrity. Early in the Program, CALFED identified broad objectives for each of these resource areas:

- Provide good water quality for all beneficial uses
- Improve and increase aquatic and terrestrial habitats and improve ecological functions in the Bay-Delta to support sustainable populations of diverse and valuable plant and animal species
- **Reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses dependent on the Bay-Delta system**
- Reduce the risk to land use and associated economic activities, water supply, infrastructure and the ecosystem from catastrophic breaching of Delta levees

The water supply reliability objective to "reduce the mismatch between Bay-Delta water supplies and current and projected beneficial uses" was defined in more detail in CALFED's March 1996 report, *Problem/Objective Definition*. In its simplest form, the definition was based on two major needs:

1. **Reduce the conflict** among agricultural, urban, and environmental water users by maintaining adequate supply and timing
2. **Reduce the uncertainty** by improving the predictability of supplies and reducing the vulnerability from potential disasters

The purpose of this report is to define a set of more measurable objectives which build on reducing conflict and uncertainty as part of the CALFED Water Management Strategy.

Need for Improved Water Supply Reliability

The Bay-Delta system provides the water supply for a wide range of instream, riparian, and other beneficial water uses which are authorized by appropriative, riparian, and pre-1914 water rights. While some water users depend on the Delta system for only a portion of their water supply, others have become highly or totally dependent on Delta water supplies. As water use and competition among uses has increased during the past several decades, conflicts have increased among users of Delta water. Heightened competition and conflict during certain seasons or during water-short years has magnified the impact from natural fluctuations in the hydrologic

cycle.

During the past several decades, as water diversions and recognition of environmental water needs have both increased, conflicts between these water uses has also increased. In response to declining fish and wildlife populations, water flow and timing requirements have been established for certain fish and wildlife species. Over the past decade, a number of actions including the Central Valley Project Improvement Act and the Delta Accord have reallocated over 1 million acre-feet (MAF) of CVP/SWP water supply for environmental purposes during the driest years. These requirements have reduced the projects' flexibility to meet the water demand both in quantity and timing for exports from the Delta. Conflicts between protective environmental measures and Delta exports also reduce opportunities for market water transfers. There are concerns that additional restrictions that might be needed to protect species or for other regulatory purposes could increase the uncertainty of Delta water supplies. This basic disparity between water needs and water availability has created economic uncertainty in the water service areas and increased conflict over supplies.

A related concern is the vulnerability of the Delta water transport system of levees and channels to catastrophic failure due to earthquakes, structural failure, or overtopping during floods. This system is also vulnerable to general failure as a result of decreasing levee stability. Such failures in the system could result in interruptions in water use in the Delta or water transport across the Delta for periods that could vary in length from days to several months.

Water Supply Reliability Objectives

CALFED seeks to develop a set of measurable objectives for a water management strategy that will reverse the ongoing trend of heightened conflicts and unacceptable uncertainty in Bay-Delta water supplies. "Measurable" is not intended to require a set of specific water quantity numbers or other metrics, but a description of objectives which can be measured by obvious reversals of past negative trends.

The *Revised Phase II Report* (December 1998) listed five water management objectives but did not provide any detailed definitions. The objectives listed in the December report are:

- Reduce diversion conflicts
- Decrease drought impacts (environment, agriculture, & urban)
- Increase supply availability (drought & average)
- Increase operational flexibility
- Increase water supply utility (water quality)

Collectively meeting these objectives would reduce water user conflicts and uncertainty in Bay-Delta water supplies and improve overall water supply reliability. The "decrease drought impacts" appears to be redundant since each of the other four objectives must be successful for

both average and drought periods. These four objectives need to be defined in more detail before a viable water management strategy can be developed. Following are draft definitions and subobjectives for each:

Reduce diversion conflicts between water users and environmental needs during average and drought periods

- Reduce adverse effects of water diversions on ecosystem health while striving to maintain water supply availability.
- Reduce impacts of environmental protection constraints on water supply operations while striving to keep environmental impacts of water operations low.

Increase supply availability during average and drought periods to the extent it is economically feasible

- Increase urban conservation to the extent it is economically feasible.
- Increase agricultural conservation to the extent it is economically feasible.
- Increase water recycling to the extent it is economically feasible.
- Provide an institutional structure in which a properly regulated and protective water market will allow water to move between users, including environmental uses, on a voluntary and compensated basis.
- Modify water supply operations to contribute towards meeting Ecosystem Restoration Program objectives leading to large self-sustaining populations of at-risk native species, reduced need for additional Delta constraints on exports, and potentially contribute to elimination of some existing constraints.
- Allow no further uncompensated reduction in water diversions beyond those currently required (1999).

Increase water system operational flexibility so it is better suited to respond to biological and hydrological variability and be more resilient to potential disasters.

- Increase the ability to interrupt or shift diversions, without resulting in supply reduction, in response to biological conditions or unforeseen circumstances.
- Increase system ability to adapt to changing/variable conditions.
- Reduce risk of potential system outages from earthquakes, floods, and general deterioration of Delta levees.
- Improve capacity to export water from the Delta while protecting environmental needs.
- Improve water supply predictability so users can make economic commitments with increased confidence.
- Improve the system's ability to shift water from season to season and from year to year to respond to hydrologic variability.

Improve water quality so available water supplies are suitable for more uses and reuses.

- Reduce total dissolved solids (TDS) in Delta water supply to allow increasing the blending ratio between Delta water supply with other water supplies.
- Reduce TDS in Delta export water supply to allow increased opportunities for recycling.
- Reduce TDS in Delta export water supply to reduce need for additional treatment of industrial process water.
- Modify water supply operations, where possible, to contribute towards meeting major objectives of the CALFED Water Quality Program:
 - Water quality targets for constituents affecting ecosystem, agricultural, and recreational water uses
 - Water quality targets for drinking water supplies; public health protection equivalent to source quality of bromide less than 50 ppb, total organic carbon less than 3 ppm, and pathogens less than the national average