CHAPTER 3. PROBLEMS AND OPPORTUNITIES

Water resource problems and opportunities provide a framework for plan formulation and helps establish objectives that a project would attempt to meet. Water resource problems in the San Joaquin Valley are associated with changing water needs, hydrologic variations in water availability, and the capacity of current water storage and conveyance facilities. Problems and opportunities addressed by the Investigation were identified in the CALFED ROD and from stakeholder input.

As stated in Chapter 1, the CALFED ROD identified three primary purposes for developing additional water storage in the upper San Joaquin River basin. These purposes include: contributing to restoration of the San Joaquin River; improving water quality in the San Joaquin River; and facilitating conjunctive water management and water exchanges that improve the quality of water deliveries to urban communities. An initial list of problems to be addressed by the Investigation is based on these purposes.

CALFED documents also indicate that other regional water resources needs should be considered in the evaluation of potential projects. Table 3.1 of the CALFED EIS Implementation Plan states that local participation is desired in the Upper San Joaquin River Basin Storage Investigation to identify how additional storage would improve flood protection and improve conjunctive management utility. The study team interprets this direction to suggest that local needs should be addressed where possible. Local input indicated that additional surface water storage could also address flood damage reduction, power generation, and recreation needs.

Problems

- San Joaquin River ecosystem
- San Joaquin River water quality
- Water supply reliability

Opportunities

- Flood control
- Hydropower generation
- Recreation
- Delta inflow

The three problems of San Joaquin River ecosystem, San Joaquin River water quality, and water supply reliability form the basis for initial plan formulation. Opportunities will be evaluated as additional needs that also could be addressed through developing additional water storage. The following sections describe each problem and opportunity in greater detail.

San Joaquin River Ecosystem

The reach of the San Joaquin River from Friant Dam to the Merced River confluence does not currently support a continuous natural riparian and aquatic ecosystem. Since completion of Friant Dam, most of the water in the river has been diverted for agricultural and M&I uses, with the exceptions of releases to satisfy riparian water rights upstream of Gravelly Ford and flood releases. Consequently, the reach from Gravelly Ford to Mendota Pool is often dry.

Flows from Mendota Pool to Sack Dam contain Delta water for delivery to the San Luis Canal Company and wildlife refuges. Groundwater seepage is the primary source of flow below Sack Dam prior to the confluence with Salt Slough. The reach from Sack Dam to Bear Creek benefits from managed wetland development, whereas marshes have been drained between Bear Creek and the Merced River. Lack of reliable flows and poor water quality in the San Joaquin River result in ecosystem conditions that are generally considered unhealthy.

During the past few decades, societal views towards the ecosystem health of rivers in the Central Valley have changed. Today, many people would prefer a sustainable ecosystem along the upper San Joaquin River. This shift in viewpoint is evident in the numerous programs addressing ecosystem restoration in the Central Valley and along the San Joaquin River as well as ongoing litigation between a coalition of environmental interests represented by the NRDC, and Reclamation and the FWUA *(NRDC v. Rodgers)*.

For several years, NRDC and FWUA have discussed various river restoration ideas that could be used as part of a settlement of *NRDC v. Rodgers.* Resolution of *NRDC v. Rodgers* may include some degree of river restoration, including a flow requirement in the San Joaquin River below Friant Dam. To date, an agreement or a legal decision has not been made regarding flow requirements or restoration objectives for the San Joaquin River downstream of Friant Dam.

The San Joaquin River Resources Management Coalition (RMC), a group of local stakeholders, has recently begun to develop a restoration plan for the San Joaquin River. This effort, funded in part through the United States Environmental Protection Agency, will be developed in several phases. The initial phase, completed in August 2003, included a description of current ecosystem conditions in the San Joaquin River from Friant Dam to the confluence of the Merced River and a process for developing a restoration plan. In the next phase, the RMC restoration plan will identify the types of actions that would be required to attain a future desired ecosystem condition and the types of constraints that may limit the extent to which such actions could be implemented.

A demand on the Friant system for river restoration could be established at some time in the future, although one is not in place today. The Investigation began with the assumption that no specific flow is required, but will consider how additional storage could be used to provide water supplies to support restoration of the San Joaquin River. The Investigation will maintain flexibility so that planning efforts could be adjusted if a river restoration requirement were established during the course of the Investigation.

San Joaquin River Water Quality

Water quality in various segments of the San Joaquin River has been a problem for several decades due to low flow and discharges from agricultural areas, wildlife refuges, and M&I treatment plants. Initial locations of concern for water quality included areas near Stockton and at Vernalis, downstream of the Stanislaus River as the San Joaquin River enters the Delta. Over time, requirements for water quality in the river have become more stringent and the number of locations along the river at which specific water quality objectives are identified has increased.

In 1998, the Central Valley Regional Water Quality Control Board adopted a Water Quality Control Plan for the Sacramento and San Joaquin river basins (Basin Plan) as the regulatory reference for meeting the State and Federal requirements. The Basin Plan lists existing and potential beneficial uses of the lower San Joaquin River, including agricultural uses, M&I uses, recreation, fishery migration and spawning, and wildlife habitat. Specific water quality standards associated with the lower San Joaquin River apply to boron, molybdenum, selenium, dissolved oxygen, pH, pesticides, and salinity. The Basin Plan is undergoing a triennial review for beneficial use and water quality standard updates.

One of the high priority issues of the Basin Plan review is the regulatory guidance for total maximum daily load (TMDL) standards at locations along the San Joaquin River. Section 303(d) of the Federal Clean Water Act (CWA) requires the identification of water bodies that do not meet, or are not expected to meet, water quality standards, or are considered impaired. The current 303(d) list (1998) identifies Mud and Salt sloughs and the San Joaquin River from Mendota Pool downstream to Vernalis as impaired water bodies. The CWA further requires developing a TMDL for each listing. The Basin Plan (including TMDL allocation) is subject to future review and revision. Although it is likely that future versions will address more restrictive water quality objectives than the current version, existing water quality objectives will be used in the Investigation.

Surface Water Supply Reliability

The CALFED Bay-Delta Program identified water supply reliability as a key problem due to a mismatch between Bay-Delta supplies and beneficial uses dependent on the Bay-Delta system. As described in Chapter 2, the Friant Division of the CVP was authorized and is operated to provide surface water supplies to areas with a high use of groundwater. Groundwater basins in the eastern San Joaquin Valley are overdrafted in most years (i.e., more groundwater is pumped out than is replenished either naturally or artificially). Although water deliveries from Friant Dam help reduce groundwater pumping and contribute to groundwater recharge, the continued general downward trends of groundwater levels reveal that significant water supply reliability problems remain.

Future operations of the Friant Division are anticipated to be similar to recent historic operations. Water supply reliability in some areas of the Central Valley will continue to be lower than historical levels and future long-term average water deliveries will likely be less than full contract amounts. Additional storage in the upper San Joaquin River basin could increase the reliability of deliveries to CVP contractors or other water users who could receive water through CVP facilities, resulting in a reduction in groundwater overdraft. This improved supply reliability would provide opportunities for exchanges with urban water users that improve the quality of urban water deliveries.

Flood Control

Flood operations at Friant Dam are based on anticipated precipitation and snowmelt runoff and the operations of upstream reservoirs. During flood operations, releases from Friant Dam are maintained when possible at flow levels that could be safely conveyed through the San Joaquin River and Eastside Bypass. Generally, flood operations target releases at or below 8,000 cubic feet per second (cfs) downstream of Friant Dam. Major storms during the past two decades have demonstrated that Friant Dam, among many other dams in the Central Valley, may not provide the level of flood protection that was intended at the time the flood management system was designed. In January 1997, flood flows from Friant Dam resulted in levee failures and extensive flooding in downstream areas.

Increased water storage capacity in the upper San Joaquin River basin would capture additional flood volume and reduce the frequency and magnitude of damaging flood releases from Friant Dam. The United States Army Corps of Engineers (Corps) recently evaluated changes in flood management operations at Friant Dam and other reservoirs in the Central Valley. Preliminary studies considered individual and combined affects of changes in flood

reservoir space and objective flows. These results show that increasing flood storage capacity in Millerton Lake or elsewhere in the upper San Joaquin River basin would have a significant effect on the magnitude and frequency of damaging flood flows downstream of Friant Dam. Although additional study is needed to quantify the economic benefits of additional flood regulation, an opportunity is present for flood damage reduction as part of new surface water storage development in the upper San Joaquin River basin.

Hydropower

Hydropower has long been an important element of power supply in California. Due to its ability to rapidly increase and decrease power generation rates, hydropower often has been used to support peak power loads in addition to base power loads. As reservoir operations have changed during the past two decades to accommodate environmental and changing water demands, the ability to rely on hydropower for meeting peak demands has decreased.

Electricity demands are expected to increase in the future. Although some new power generation capacity will likely come on-line, it is reasonable to expect that new generation capacity will still be required. Although the economic feasibility of hydropower-only projects may be limited, developing new storage for water supply, water quality, ecosystem restoration, and flood damage reduction creates opportunities to add hydropower features.

Recreation

Demands for water-oriented recreational opportunities in the San Joaquin River basin are high. Some of these demands are served by reservoirs on the western slope of the Sierra Nevada Mountains. As population increases in the San Joaquin Valley, recreational demands are expected to increase.

Additional storage in the upper San Joaquin River basin could provide opportunities to increase water-oriented recreation facilities, such as swimming, access points for various types of boating, and trail use. In addition, the release of water from Friant Dam to the San Joaquin River for ecosystem restoration or water quality purposes could also increase recreation opportunities along the river.

Delta Inflows

The primary goals of the CALFED Bay-Delta Program are to improve ecosystem conditions in the Bay-Delta and the reliability of water supplies dependent on the Bay-Delta. Several actions are needed to accomplish these goals, including increasing Delta inflow and reducing Delta export pumping that adversely impacts sensitive species. Additional storage in the upper San Joaquin River basin could change the magnitude, duration, or frequency of inflows to the Delta due to river releases intended to improve the San Joaquin River ecosystem or water quality. The ability of water released from Friant Dam to reach the Delta would depend on water use at Mendota Pool and seepage to groundwater along the San Joaquin River.

Because of the great distance from Friant Dam to the Delta, it is unlikely that new storage in the upper San Joaquin River basin would be operated specifically to meet Delta flow and water quality objectives. However, water released for other purposes, such as water quality or river restoration, could improve the magnitude of Delta inflow at times when additional flow would be beneficial ecological conditions in the Delta.