

7. CONCLUSIONS

General

This Chapter summarizes the draft findings and conclusions of the Matilija Dam Environmental Restoration Study.

Construction of the 190-foot high Matilija Dam was completed in 1947 by the Ventura County Flood Control District to provide water storage for agricultural needs and limited flood control. This concrete arch dam is located about 16 miles from the Pacific Ocean and just over half a mile upstream from the Matilija Creek confluence with the Ventura River.

Problems associated with the dam were soon evident. These problems include: large volumes of sediment deposited behind the dam and the loss of the majority of the water supply function and designed flood control capability; the deteriorating condition of the dam; the non-functional fish ladder and overall obstruction to fish passage; the loss of riparian and wildlife corridors between the Ventura River and Matilija Creek; and the loss of sediment transport and resulting erosion to downstream reaches of the Ventura River, the estuary and the sand-starved beaches along the Ventura County shoreline.

Sedimentation behind the dam rapidly reduced the ability to store a significant amount of water for future use. A relatively small and shallow reservoir remains behind the dam, presently estimated to be about 500 acre-feet or 7% of the original capacity. It is estimated that approximately 6 million cubic yards of sediment (silts, sands, gravels, cobbles and boulders) has accumulated behind the dam. Currently Matilija Dam is subject to overtopping during storm flows.

By year 2040, the reservoir is expected to have reached an equilibrium condition and be completely filled with sediment totaling over 9 million cubic yards. As the dam overflows, full sediment loads from the upstream watershed will be carried downstream.

Historically, the Ventura River system supported a substantial number (approximately 4,000 to 5,000 spawning fish) of southern California steelhead, an endangered species of migratory trout. NOAA Fisheries most recent population estimates for steelhead are less than 100 adults for the entire Ventura River system. The steelhead habitat upstream from Matilija Dam was historically the most productive spawning and rearing habitat in the Ventura River system. It is estimated that about 17.3 miles of prime steelhead habitat was lost due to the construction of Matilija Dam.

Other physical barriers to fish passage include the Robles Diversion Dam, less than two miles downstream of Matilija Dam on the Ventura River. This dam diverts water from Ventura River to Casitas Dam, the remaining significant surface water supply for the Ventura watershed and surrounding areas. The Casitas Municipal Water District is currently pursuing restoration for fish passage at the Robles Facility and implementation is expected by 2005.

The problems and opportunities identified in this study were used to describe specific planning objectives that represent desired positive changes in the without project conditions and provided focus for the formulation of alternative plans. The primary ecosystem restoration study objectives are:

- Improve aquatic and terrestrial habitat along Matilija Creek and the Ventura River to benefit native fish and wildlife species, including the endangered Southern California steelhead trout.
- Restore the hydrologic and sediment transport processes to support the riverine and coastal regime of the Ventura River Watershed.
- Create recreational opportunities along Matilija Creek and the downstream Ventura River system.

Planning constraints also have been identified through the study process, particularly during meetings with the Sponsor, resource agency representatives and other stakeholders. Some of the key constraints that were considered in formulating and evaluating alternatives included:

- ▶ Maintain the current level of flood protection along the Ventura River downstream of Matilija Dam.
- ▶ Limit adverse impacts to normal water supply quantity, quality and timing of delivery to Casitas Reservoir via Robles Diversion Dam
- ▶ Limit impacts to water quality in Lake Casitas by potentially turbid flows resulting from the release of Matilija Dam trapped finer sediments.

Preliminary studies considered a wide range of alternative measures to provide positive outputs to the planning objectives, as well as consideration of the impacts and mitigations needed to address the major constraints. The initial screening of alternative measures and plans led to the comparison and evaluation of seven action alternatives evaluated in detail, organized into alternatives 1 through 4, with alternatives 2, 3, and 4 formulated with “a” and “b” options. The alternatives involved various combinations for removing the dam and reservoir sediments. The cost for the plans ranged from \$104 million to \$129 million, and benefits measured as increases in average annual habitat units ranged from 554 to 731 AAHUs. The final alternatives were analyzed based on cost effectiveness, and incremental cost analysis, considering changes to national economic development, environmental quality, regional economic development and social and other impacts. The tradeoffs to these accounts and between the plans were identified, as well as consideration of other evaluation criteria required by Federal laws and policies. The Plan that optimizes the increase in environmental benefits as compared to minimizing economic costs was identified as the National Ecosystem Restoration Plan (NER). The NER Plan is Alternative 4b. The Locally Preferred Plan is Alternative 4b with the addition of a desilting basin as a project associated feature.

The Recommended Plan is Alternative 4b. The Recommended Plan includes full dam removal in one phase. Portions of the trapped sediment will be removed by slurry line to

a downstream 97-acre disposal site, in the proximity of Highway 150 Bridge, and the remaining two-thirds of trapped sediment will be contoured to restore a fish passage channel, allowing storms to naturally erode sediments downstream. Four sediment storage sites will be used in conjunction with the construction of the fish passage channel, and soil cement will protect these sites from erosion for the more frequent storm flows (less than 10 year return periods). These actions will lessen turbidity levels downstream, except for larger storm events, reducing potential adverse impacts to fish migration and water diversion activities along the Ventura River.

Removal of Matilija Dam will cause erosion trends downstream to reverse and become depositional trends, eventually restoring more stable (equilibrium) conditions to the Ventura River reaches. The deposition would recreate a riverine morphology, in terms of channel and riverbed materials characteristics, similar to pre-dam conditions. The estimated timeframe to reach equilibrium is approximately 10 years for the Recommended Plan.

The process of returning the river to pre-dam conditions will increase the flooding risk to infrastructure that has developed along the river corridor since the construction of the dam. The Recommended Plan includes features to mitigate the induced flood risk including removal of structures, replacement of a bridge, and raising and extending downstream levees and floodwalls.

The removal of Matilija Dam will also cause impacts to downstream water supply facilities. A sediment bypass structure and sediment desilting basin is proposed to reduce impacts to the Robles Diversion and Lake Casitas facilities, while construction of two wells at Foster Park is included to reduce impacts to City of Ventura facilities.

Ecosystem restoration measures also include exotic and invasive species removal and planting of native species in the downstream reaches. Recreation measures will also be implemented involving a system of trails and interpretive centers.

Ecosystem restoration benefits for this study have been prepared using a modified Habitat Evaluation Procedure (HEP) analysis. The Average Annual Habitat Units (AAHUs) have been computed over a 50-year period. The Recommended Plan will restore the Matilija Creek ecosystem to natural riverine predam conditions, thereby providing fish passage for the steelhead to over 17 miles of critical habitat. It is estimated that this can result in restoration of a healthy and sustainable adult steelhead population, similar to what existed prior to the construction of Matilija Dam.

The first cost for implementing the recommended plan is estimated to be \$123,777,000 (Fiscal Year 2004 Price Levels), which includes costs for lands, easements, rights-of-way, relocations, and material disposal site; construction costs for the restoration and mitigation features, monitoring and adaptive management plan, associated costs for purchasing mitigation water, and recreation features. The estimate of first costs also includes the cost for preconstruction, engineering, and design (PED) and construction management. Operation and maintenance costs are estimated to be about \$350,000 per

year, and include rip rap protection for downstream levees, some sediment and debris removal around Robles Dam to maintain water supply diversions, and Arundo removal and control.

An economic analysis comparing the average annual costs of the recommended plan to the project outputs as defined by the increase in average annual habitat units, indicates a cost of about \$10,130 per average annual habitat unit. The recommended plan would improve about 2,814 acres of the Matilija and Ventura River ecosystem. This reflects a first cost per acre of about \$44,000. The recommended plan is considered justified when considering the significance of the output benefits as compared to project costs.

The environmental impacts of the recommended plan were evaluated in accordance with the requirements of the National Environmental Policy Act (NEPA) and California Environmental Quality Act (CEQA). The findings reflect the positive benefits of restoring the natural ecosystem to pre dam conditions. It also reflects that significant adverse impacts will occur to those areas affected by flood control and water supply mitigation measures. These generally include impacts to affected and adjacent habitats, aesthetics and vistas due to levee and floodwall construction, and other impacts associated with construction activities, and operation and maintenance requirements.

The non-Federal share of the cost of implementing the project is 35 percent of the first cost for implementing the project and 100 percent of the OMRRR costs. The project sponsor is responsible for providing 100 percent of the LERRDs for the project and will get credit for their value towards their 35 percent of the project. The sponsor is also responsible for 50 percent of the cost for implementing the recreation features and 100 percent of the OMRRR cost for the recreation features. There are a number of other items of local cooperation required by the non-Federal Sponsor, which is outlined in the report. At this time, the Ventura County Watershed Protection District has indicated their interest in proceeding with the Recommended Plan for authorization for construction.

A number of Federal, State, County, and local agencies as well as some other interests participated in the study as part of the Study Task Force or Working Group members. In general, there is strong support for the Recommended Plan.