

CASE STUDY REPORT #57
PLEASANT VALLEY DAM
OWENS RIVER

I. Project Description

Pleasant Valley Dam on the Owens River is on the east side of the Sierra Nevada near Bishop, California, and impounds the runoff of 574 square miles (see Figure 1). The Los Angeles Department of Water and Power (Los Angeles) erected the dam in 1955. Pleasant Valley Reservoir stores a maximum of 3,825 acre-feet covering 115 acres. It is operated by Los Angeles for power, municipal water and flow regulation. The reservoir modulates flow fluctuations caused by power production at plants in the Owens Gorge.

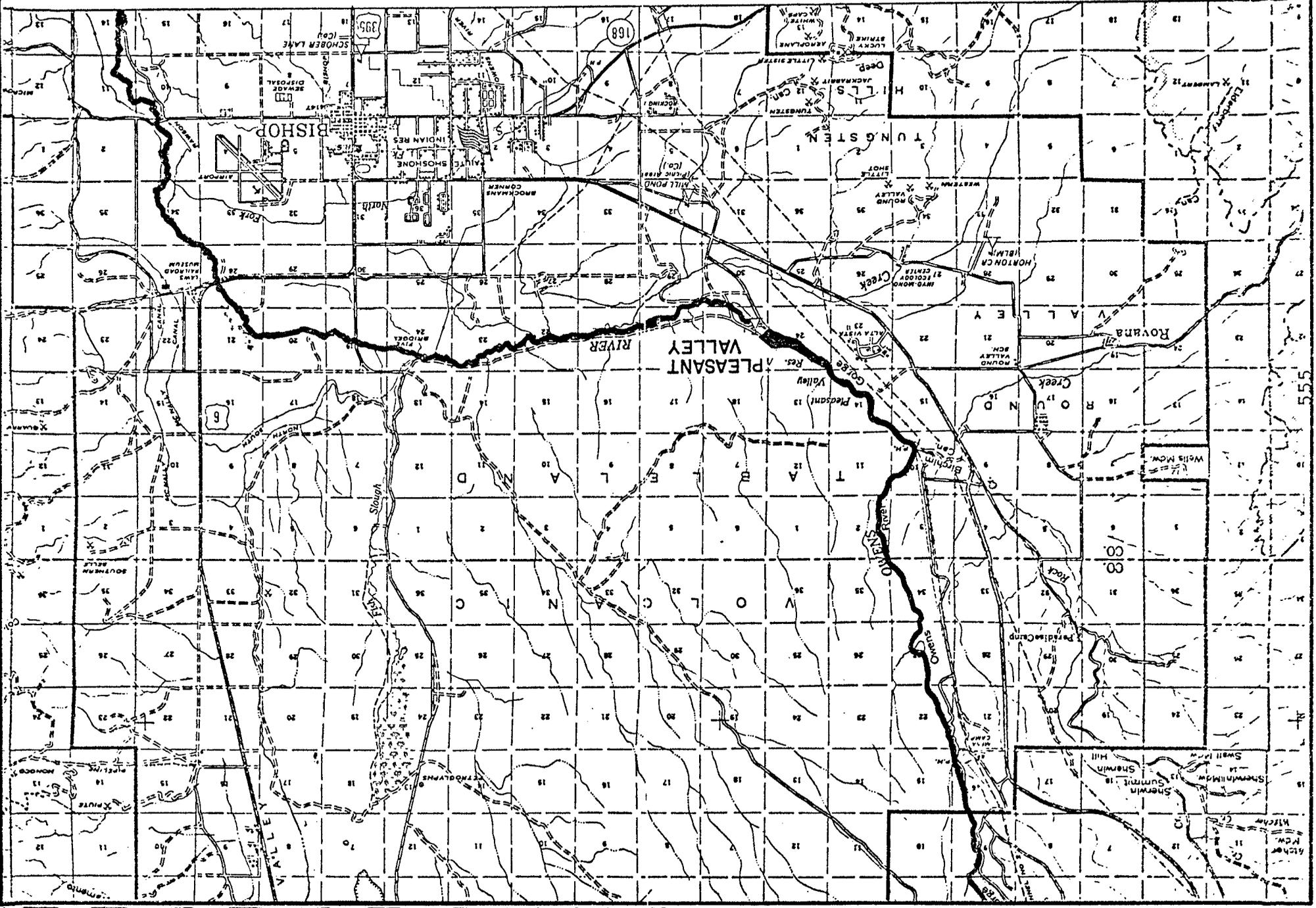
II. Pre-Project Condition

The streamflow pattern of the Owens River (Figure 2) exhibits peak mean monthly flows in June (480 cfs) and low average flows during winter (200 cfs). This instream flow pattern is influenced by water imported from the Mono Lake Basin and by the operation of Crowley Reservoir, both of which commenced in 1941.

Fish historically present in the Owens River include brown trout, rainbow trout, tui chub, carp, suckers, and mosquito fish. Species which were widely distributed historically but have developed limited population numbers and distribution include the Owens River tui chub and the Owens River pupfish. The pupfish was adversely affected by competition from introduced fish and

Source: U. S. Forest Service,
1972.

Figure 1
LOCATION MAP



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elimination of habitat by drainage of marshy areas. The tui chub has been reduced by hybridization with other species of chub and streamflow alteration in the upper Owens River. A major sportfishery is supported by the brown trout populations in the river. Estimates of population size and angler use prior to the project were not found in the data reviewed, but the area had a reputation as a good sport fishery.

Each fall spawning migrations of brown trout would utilize some of the tributary streams in the Pleasant Valley area such as Rock and Pine Creeks.

III. Project Development

During the development of Pleasant Valley the project was vigorously protested by local sportsmen. They maintained that the spawning grounds and migration routes would be lost with inundation and blockage by the dam. Also it was felt that water releases would further damage the fishery.

The DFG decided that the construction of a fishway over the proposed dam would be impractical due to height (80 feet) and that alternate requirements for the operation of the dam would be withheld pending post-construction investigations.

When the dam became operative the department and Los Angeles engaged in a series of conferences regarding provisions for compensation. Subsequently an agreement resulted which provided that Los Angeles finance and construct an artificial spawning channel one-half mile below the dam.

The channel, completed in 1962, is 1,000 feet long, 15 feet wide and has 18 inches of gravel. DFG determined that a flow of 75 cfs was necessary for the operation of the channel and this minimum instream flow reservation is required at all times.

In 1966 it became apparent to the DFG that the operation of Pleasant Valley was creating some adverse streamflow conditions in the Owens River. In response to DFG requests Los Angeles informally agreed to adjust the project operation as much as possible to meet instream flows recommended by the DFG.

The DFG recommendations were based on observations and concerned with streamflows during the period of brown trout egg incubation and fry emergence (October 15 to April 15).

The instream flow recommended for this period (April 15 to May 15) was a constant or gradually fluctuating 200 cfs, although flows up to 500 cfs could be tolerated if changes are gradual. Instream flow during the remainder of the year was considered less important; however, it was requested that any changes in flow be made gradually to minimize scouring and avoid stranding fish in oxbows and vernal channels. Since this 1966 informal agreement the DFG has secured other agreements with Los Angeles to supply water to various sloughs and the Owens Valley pupfish sanctuary located on the Owens River Flood Plain. The Owens River pupfish, an endangered species (DFG, 1974), is protected from habitat dewatering by sanctuary.

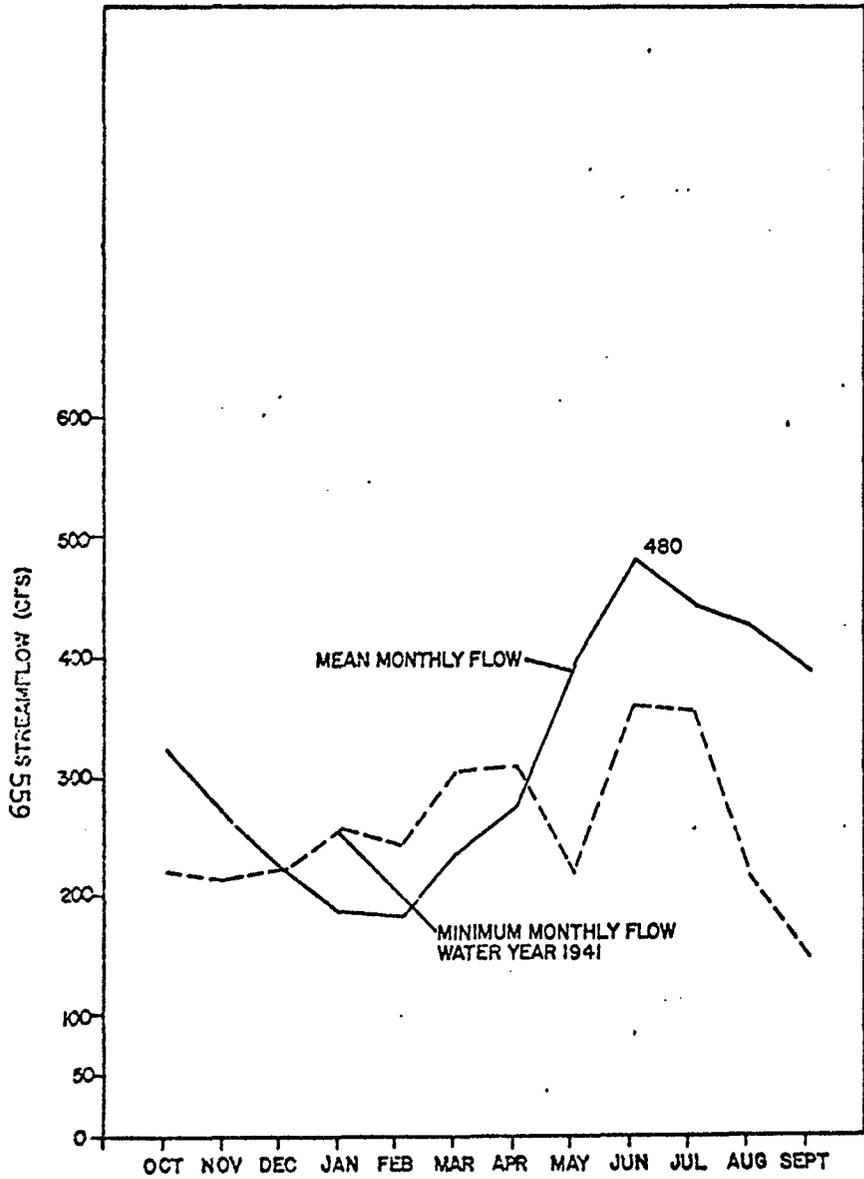
IV. Post-Project

The operation of Pleasant Valley Reservoir did not significantly alter the basic seasonal distribution of streamflow because of its small storage capacity and the operation of power facilities below the dam (see Figure 2). However, power production has caused some widely fluctuating flows in the lower river. Because of the 1966 informal agreement between Los Angeles and the DFG widely fluctuating flows have been smoothed (Pister, pers. comm.).

The lower Owens River has physically changed due to increased water developments. Increased summer flows and reduced winter flows have resulted from water export. A second export aqueduct was completed in 1970 and the USGS and the DFG initiated a study of erosion and sedimentation in the lower river caused by changes in streamflow patterns.

This study has shown that increased summer streamflow has accelerated the natural process of oxbow cutting. This cutting action has produced increased bedload and sedimentation that supplies gravel in areas where the bedload is blocked by dams (USGS, 1975).

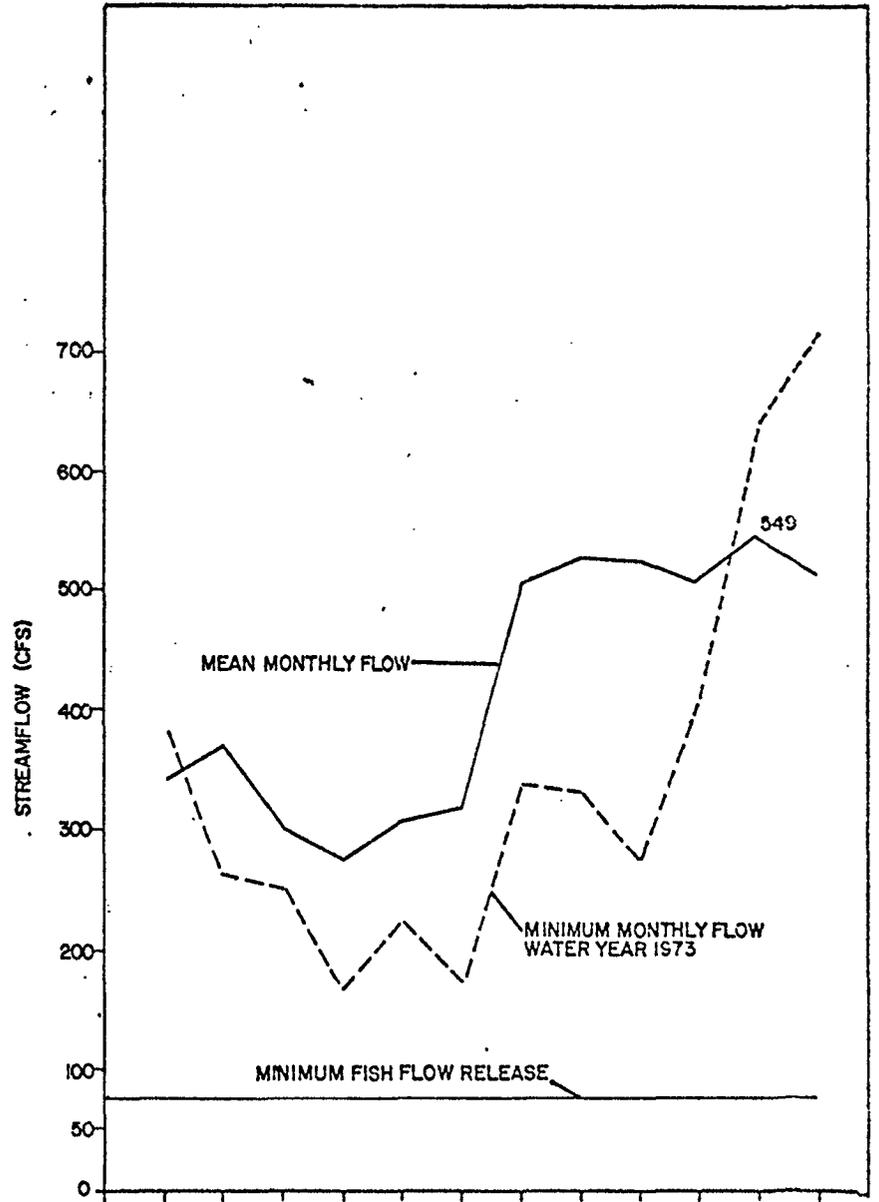
The lower Owens River below Pleasant Valley Reservoir presently supports a self-sustaining population of brown trout. There was one recorded fish kill, resulting in a large number of brown trout mortalities due to depressed dissolved oxygen. Department personnel have observed 118 trout nests in the spawning



PRE-PROJECT: OCTOBER 1941-SEPTEMBER 1950
 GAUGE STATION NO.
 SOURCE: CITY OF LOS ANGELES DEPARTMENT OF WATER AND POWER

FIGURE 2
 STREAMFLOW CONDITIONS, OWENS RIVER
 PLEASANT VALLEY RESERVOIR

POST-PROJECT: OCTOBER 1965-SEPTEMBER 1974
 GAUGE STATION NO.
 SOURCE: L.A.D.W.P.



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channel during the years 1962-1964. The majority of the spawning activity occurred in 1963 as a result of planting surplus hatchery brood stock (DFG, 1966). Since 1967 the seven-mile section of the river below the dam has been included in the DFG wild brown trout management program. The status of this fishery was reviewed during 1970, 1972 and 1974 and compared to the 1967, 1968 base line survey. During the 1970 to 1974 period fishing success declined somewhat in the spring but remained relatively constant in the summer and fall. However, the number of brown trout caught over 10 inches in length increased by 10 percent over the original survey. Other studies conducted on the lower Owens River include age, growth, food habits and other life history characteristics. The trapping of spawners at the entrance to the Pleasant Valley spawning channel and making weekly counts at the nests has shown a two-fold increase in the spawning runs between 1967 and 1974.

V. Conclusions

The operation of Pleasant Valley Reservoir did not significantly alter the basic seasonal distribution of streamflow because of its small storage capacity and the operation of power facilities below the dam (see Figure 2).

During the initial development of the project there was a great deal of public concern expressed over the blockage of brown trout migration routes by the dam. The method used by the DFG

to preserve fishlife consisted of a post-project instream study which determined that a spawning channel and a minimum instream release of 75 cfs (which was required for the spawning channel) would be required. Subsequent observations by the DFG indicated that the methods to preserve fish and wildlife were ineffective, mainly because they had not anticipated the adverse effects of flow fluctuation and instream flows less than 200 cfs during the period of brown trout egg incubation and fry emergence. In response to this problem the DFG and Los Angeles entered into an informal agreement providing minimum instream flow requirements for brown trout populations. With this agreement the resulting operation of the dam has effectively maintained brown trout populations in the lower Owens River as indicated by data collected by the DFG since the stream entered the Wild Trout Management Program.

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Personal Communications

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