CASE STUDY REPORT #77
SANTA FELICIA DAM
PIRU CREEK

I. Project Description

The Piru Creek drainage lies in the coastal mountains of Southern California in the Los Padres and Los Angeles National Forests (see Figure 1). The drainage area above Santa Felicia Dam is 1-1/2 miles above the mouth of the creek and impounds the runoff from the 422-square mile watershed. Considering the size of the watershed and the length of the creek (approximately 70 miles), Piru Creek is one of the major tributaries of the Santa Clara River.

The United Water Conservation District completed construction of the Santa Felicia project in 1955. The original project included scarification of the Santa Clara River channel to induce percolation within water district boundaries. The reservoir stores 100,000 acre-feet covering 1,240 acres for irrigation and groundwater recharge.

II. Pre-Project Condition

Unimpaired runoff in Piru Creek normally peaked in March with a mean monthly flow of 180 cfs. During the dry season average monthly streamflow was above 8 cfs (see Figure 2). There is a large variation in annual runoff that is most apparent in a minimum water year (see Figure 2). The lower reach of the stream (in the project area) was described by the DFG as a low gradient,

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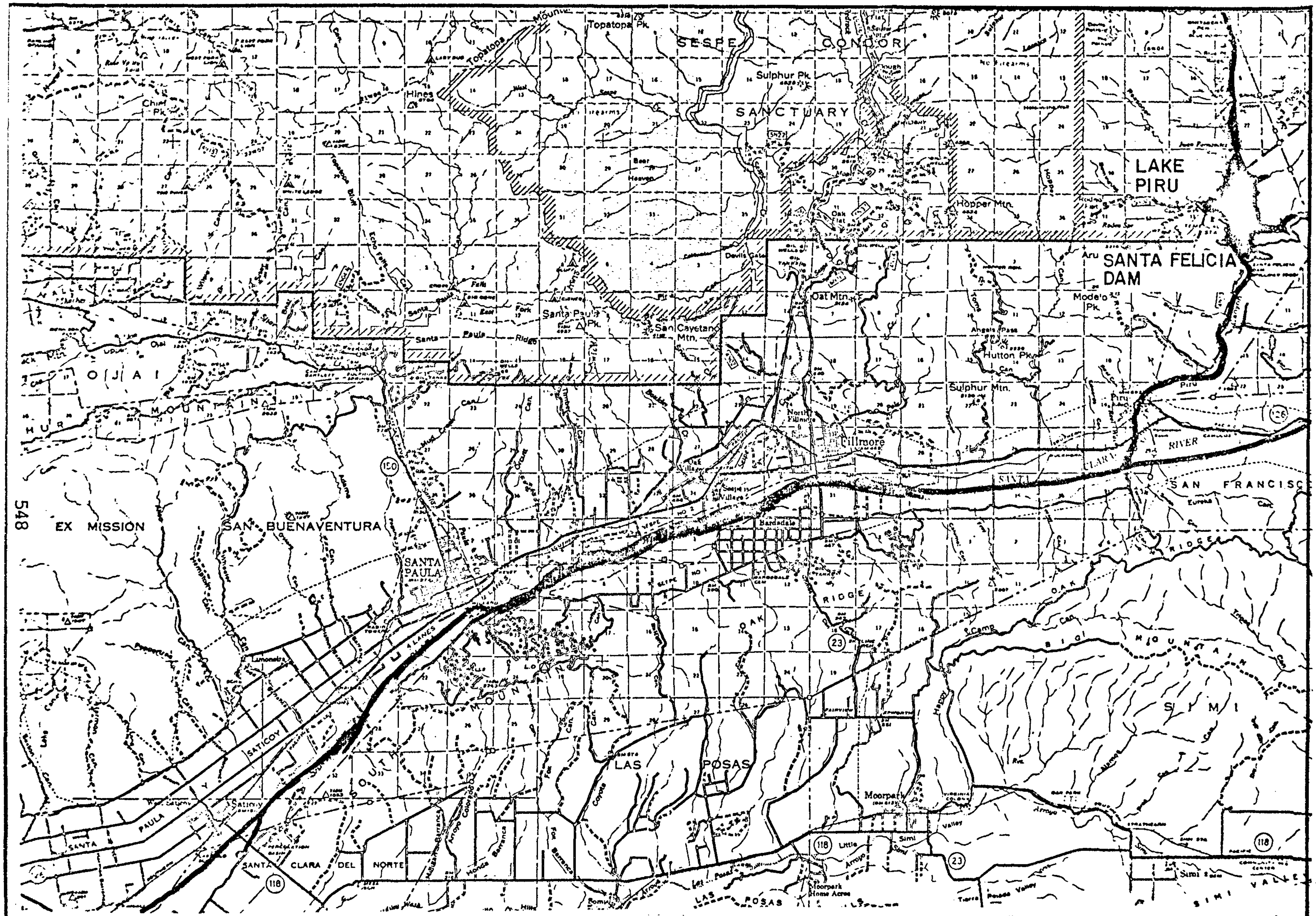

Source: U. S. Forest Service 1974.

Figure 1

LOCATION MAP

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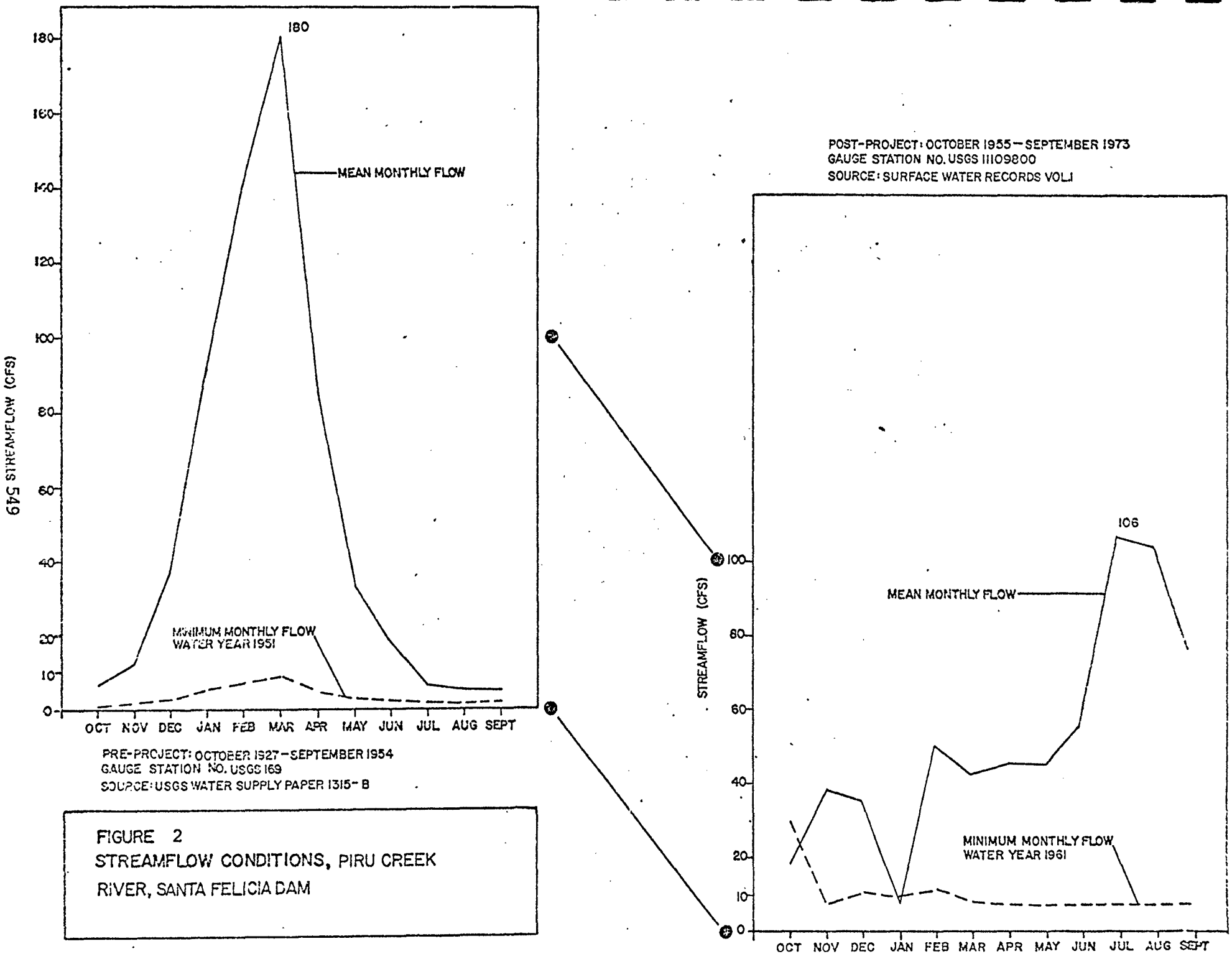

FIGURE 2
STREAMFLOW CONDITIONS, PIRU CREEK RIVER, SANTA FELICIA DAM

broad open stream with a lack of cover. Conditions were conducive to high surface water temperatures with recordings in May as high as 83°F.

The streamflow in Piru Creek during a wet cycle supported a significant steelhead fishery. Steelhead trout migrated to spawning grounds in the headwaters of the stream approximately 60 miles above the damsite. The last run of steelhead in Piru Creek occurred in 1946. Since that time a succession of low flow conditions prevented migration.

The resident fish in Piru Creek included native chubs, suckers and possibly unarmored, three-spined stickleback (DFG, 1974). A managed rainbow trout fishery was present in the spring and summer months and was supported by DFG stocking operations. Summer temperatures and low streamflow in the lower reach of the creek were often lethal for rainbow trout.

III. Project Development

In February, 1954, the United Water Conservation District filed a water right application for the construction of Santa Felicia Dam. The DFG sent a letter (July 1952) to the State Engineer on the "water requirements for the protection and maintenance of fishlife". The DFG was primarily concerned about steelhead spawning populations entering the Santa Clara River, but they concluded that a fishway over the Piru Creek Dam was impractical. The department considered taking action through Sections 526 or 530

of the Fish and Game Code (harmful or deleterious effects on the environment), but no action was taken. Requests for instream flow reservations were not discovered in the file data reviewed, and there is no fish release agreement in the terms of the state water rights permit issued for the project. However, there is a downstream water release for riparian water rights and groundwater recharge. The District tries to maintain a minimum instream flow release of 10 cfs for these purposes and to maintain a live stream below the dam year round as part of an informal agreement with the DFG (Thompson, pers. comm.).

IV. Post-Project

The natural seasonal streamflow pattern in Piru Creek has been drastically altered by the operations of Santa Felicia Dam (see Figure 2). Early spring streamflows are reduced to less than one-half of the average unimpaired flows while summer flows are greatly increased.

Variations in the amount of annual runoff are reflected in reservoir operation records. The reservoir became dry on one occasion (water year 1961) and during most years there are daily records showing zero instream flow in Piru Creek. The inflow to Santa Felicia Reservoir was stabilized and regulated by the construction of Pyramid Dam (capacity 179,000 acre-feet) in 1973.

During the 1961 water year when Santa Felicia Reservoir went dry, the DFG salvaged a total of 1,200 pounds of fish from the reservoir in late October. Also the pool below the dam was seined

and a number of channel catfish, largemouth bass, redear sunfish and suckers were recovered showing that primarily a warmwater fishery was present below the dam.

DFG correspondence indicates that streamflow and temperature conditions in Piru Creek are somewhat improved for supporting a coldwater fishery due to high summer discharges from the hypolimnion of the reservoir. The potential trout fishery along this reach of Piru Creek has not been developed by stocking operations because the creek flows through private land. The reservoir is stocked with catchable rainbow trout (about 100,000 per year) and it may be possible that some rainbow trout could have escaped into the stream through the unscreened outlet of the dam.

Information regarding the effect of the operation of the Santa Felicia project upon the unarmored, three-spined stickleback population in the Santa Clara River was not discovered. This species of fish is presently considered endangered by the DFG (DFG 1974). Also the Santa Felicia project is located on the boundary of the California Condor Preserve. However, no data on the impact of the reservoir upon this endangered population were revealed.

V. Conclusions

The operation of Santa Felicia Dam altered the pre-project flow by providing high stream discharges during the irrigation season and storing natural runoff during the wet season. None

of the storage in the reservoir was officially allocated to fish and wildlife conservation and as a result the altered flow regime and the barrier presented by the dam eliminated populations of steelhead trout that had annually spawned in Piru Creek.

Investigations to determine instream flow needs were not conducted because fish and wildlife conservation was not a project objective.

The maintenance of fish life by the minimum instream flow release informally agreed upon by the DFG and the water district is difficult to analyze because post-project investigations on Piru Creek were not discovered.

BIBLIOGRAPHY

Personal Communications

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