CASE STUDY REPORT #68
BLACK BUTTE RESERVOIR
STONY CREEK

I. Project Description

Stony Creek originates near the crest of the Coastal Range mountains in Glenn County at elevations of about 7,000 feet. It drains an area of 800 square miles discharging into the Sacramento River near Hamilton City (Figure 1). The Black Butte project, completed in 1962 by the U. S. Army Corps of Engineers, is located on Stony Creek approximately 25 miles upstream from where it enters the Sacramento River. The operation of Black Butte Reservoir, for flood control and water conservation, is under the jurisdiction of the U. S. Bureau of Reclamation. It also provides for municipal and recreational uses. The reservoir has a storage capacity of 160,000 acre-feet and covers 1,530 acres.

The inflow to Black Butte Reservoir is partially regulated by Stony Gorge and East Park Reservoirs which are operated by the Orland Water Users Association for municipal and agricultural purposes (Figure 1). The water released from Black Butte Dam is diverted from the stream about 22 miles below the dam by a gravel diversion dam installed each irrigation season by the Glenn-Colusa Irrigation District.

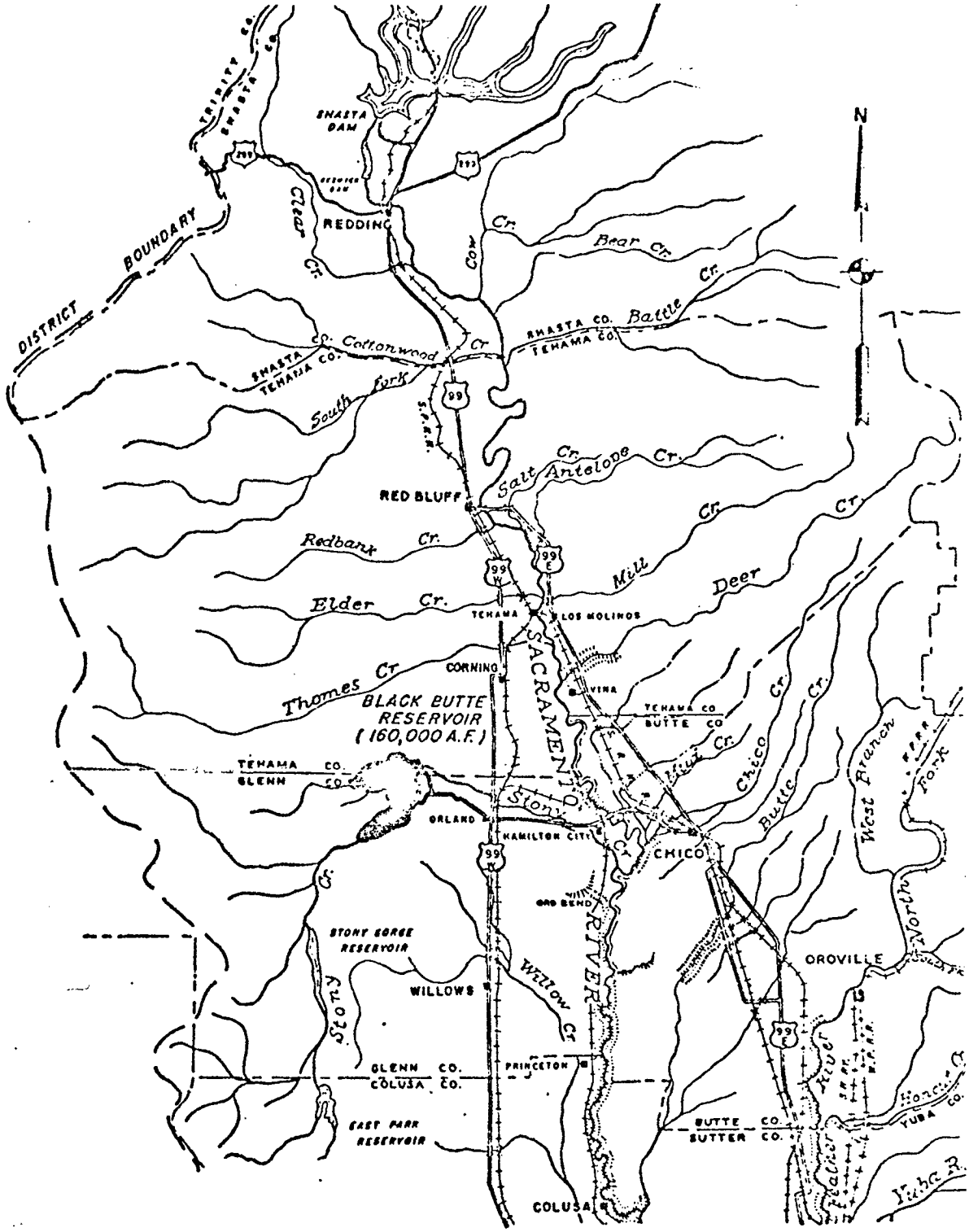

Figure 1

LOCALITY MAP

BLACK BUTTE RESERVOIR

SCALE IN MILES

10 5 0 10

SOURCE: U.S. ARMY CORPS OF ENGINEERS, 1973.

II. Pre-Project Conditions

Prior to the completion of the Black Butte project, the streamflow on Stony Creek was regulated by East Park Dam, completed in 1910, Stony Gorge Dam, completed in 1928, and the temporary gravel dam which has been constructed on lower Stony Creek each year since 1914 by the Glenn-Colusa Irrigation District. It is usually constructed in April when the demand for rice flooding water begins. The lower section of Stony Creek remains dewatered until late fall-early winter when flows greater than 500 cfs top the gravel dam and wash it out (Figure 2).

Since the start of the Glenn-Colusa Irrigation District operation, salmon runs have never reached the stock size that the stream could carry. The Department of Fish and Game has considered building a fishway bypassing the canal, but the cost is prohibitive. The U. S. Fish and Wildlife Service has estimated an average annual run of 400 king salmon. King salmon and steelhead have been recorded as far as 10 miles upstream of the present Black Butte dam site.

During years of successful spawning in Stony Creek, the production and downstream migration of juvenile salmon and steelhead has been impaired by the complete diversion of the creek.

Creek; (2) to be in a favorable position for bargaining should a possible solution to the problem develop before the hearing". The department also stated in the letter that:

> "It is not likely that the fishery in Stony Creek can be enhanced with water from the Black Butte project. The Fish and Wildlife Service has estimated that minimum flows would have to exceed 100 cfs. Flows of this magnitude probably would not be available for fish. We do not anticipate that the Water Rights Board will give much consideration for the present Stony Creek fishery resource."

An argument submitted by the bureau in response to the Department of Fish and Game protest stated that the action requested by the Department of Fish and Game constituted an enhancement of any existing salmon habitat and was therefore an inadequate basis for protest. Consequently, the Department of Fish and Game withdrew their protest before the date of the scheduled Water Rights Board hearing. The department decided that the best course of action would be to endorse a U. S. Fish and Wildlife Service plan for Stony Creek, because it appeared to be a feasible solution to the problems of rehabilitating the salmon fishery.

The U. S. Fish and Wildlife Service plan proposed to release water from the bureau's Tehama-Colusa canal to augment streamflows in lower Stony Creek. This canal crosses Stony Creek seven miles above the Glenn-Colusa Irrigation District's dam site.

During the preliminary investigation of the U. S. Fish and Wildlife Service plan, it was anticipated that a release of 550 cfs from October to April from the Tehama-Colusa Canal into Stony Creek would provide the water for the Glenn-Colusa Irrigation District without the use of a gravel diversion dam. The U. S. Fish and Wildlife Service determined that this condition would accommodate an annual run of approximately 7,000 salmon and steelhead in lower Stony Creek.

The U. S. Fish and Wildlife Service plan which was agreed to by the Department of Fish and Game was apparently never adopted. Further studies indicated that spawning gravel quality had deteriorated and salmon restoration was no longer feasible. Presently there is no live stream below the Glenn-Colusa Irrigation Dam during the diversion season and the Black Butte project does not incorporate any mitigative or minimum release requirements for the preservation or enhancement of the fishery resources of Stony Creek. There is a release of 30 cfs for downstream groundwater recharge when the water is available in Black Butte Reservoir.

IV. Post-Project

The operation of the Black Butte project has increased the streamflow during the late spring and summer months (see Figure 1). During dry years, such as the present water year (1976), the water for the 30 cfs release is not available during the spring storage phase of the reservoir (Schuster, pers. comm.).

Studies showing the effects of the post-project flow regime on the fishery resources of Stony Creek were not discovered. The creek does support a warmwater stream fishery. Salmon and steelhead found on Stony Creek are generally considered strays from Sacramento River production (Gerstung, pers. comm.).

The fishery resources of Black Butte Reservoir have been developed by the Department of Fish and Game through the planting of striped bass. The reservoir does not support trout, but good warmwater fish populations are present.

The Department of Fish and Game has, on occasion, requested the bureau to stabilize reservoir levels during the spring in order to permit successful bass and crappie spawning.

V. Conclusion

Because of downstream diversion made during the irrigation season (April through November), there is often no instream flow at the mouth of Stony Creek. This condition has existed since 1914 and has greatly impaired utilization of the stream by salmon and steelhead.

During project development, the Department of Fish and Game attempted to acquire an instream flow reservation, but it became apparent that flows of the magnitude needed would not be available. The limited pre-project fishery resources of the stream were also a consideration, and thereafter the

Department of Fish and Game withdrew their protest. Determinations of the minimum instream flows needed in lower Stony Creek were made by the U. S. Fish and Wildlife Service using reconnaissance-level investigations. Alternate methods of instream flow preservation were also explored. However, none of the alternate plans for minimum instream flow requirements were ever adopted, because the U. S. Bureau of Reclamation determined that such actions constituted enhancement. There is a minimum release of 30 cfs made at the dam to provide downstream groundwater recharge and this flow supports fish, including a few salmon and steelhead in some years. The streamflow regime in Stony Creek is generally ineffective in maintaining anadromous fish except for strays from Sacramento River production.

BIBLIOGRAPHY

Personal Communications

Gerstung, Eric. 1976. Associate Fishery Biologist, California Department of Fish and Game, Region 2, Sacramento.

References

California. Department of Fish and Game. 1960. Department of Fish and Game file correspondence. 4 pp.

California. State Water Resources Control Board. 1962. Decision 1100, Black Butte project.