State of California

The Resources Agency

# Memorandum

To: Water Projects Files, Region 3

Date: November 3, 1969

**From: Department of Fish and Game - Keith R. Anderson**

Subject: U. S. Soil Conservation Service, Anderson Valley Watershed Project, Mendocino County; Fish Population Estimate, Mill Creek.

The Anderson Valley Watershed Project as proposed by the Mendocino County Soil Conservation District calls for a multipurpose reservoir on Mill Creek near Boonville, diversion dams on Anderson Creek and Robinson Creek, and a conveyance system from the diversion dams to the proposed reservoir. The purposes of the proposed project are to develop a firm water supply for municipal and agricultural needs, flood control, and recreational development.

The project will have a significant impact on the fishery resources of the three above mentioned streams. Information from Regional files, local residents, and stream surveys indicate that steelhead utilize Mill Creek and Anderson Creek for spawning and nursery habitat. Robinson Creek is of little or no importance for steelhead production upstream from Mill Creek.

On June 24, 1969, fish populations in selected sections of upper and lower Mill Creek and a major tributary were sampled with a fish electro-shocker in an attempt to estimate the standing crop of juvenile Steelhead present. In addition to juvenile steelhead, minimal numbers of threespine sticklebacks were collected. Sticklebacks averaged about 10-20 per 100 feet of stream in Mill Creek. None were observed in the tributary. The yield from three 100 foot electro-fishing stations (selected to be representative of definite stream sections) and population expansion figures based on these yields are summarized as follows:

Juvenile Steelhead, Mill Creek, June, 1969:

| | Upper Mill Cr. | Lower Mill Cr. | Tributary |
|---|---|---|---|
| No. fish collected in 100 ft. station | 56 | 64 | 24 |
| Population expansion: | | | |
| No. fish per 100 ft. of stream* | 58 | 73 | 26 |
| Length of stream section (ft.) | 5,200 | 5,200 | 3,600 |
| Fish per stream section | 3,000 | 3,800 | 900 |

Total estimate for Mill Creek drainage: 7,700 juvenile steelhead

*Population expansion based on formula $N = \frac{(Y_1)^2 - Y_2}{Y_1 - Y_2}$

One must note that the above total is only an estimate of the standing crop of juvenile steelhead as of June 24, 1969. It is not an estimate of total production. Unknown factors such as hatching success, degree of downstream migration, and mortality make it impossible to reliably estimate annual production or estimate the size of the annual run of adult fish. The estimate of standing crop may, however, be used as a "ballpark estimate of production" in favor of relying solely on a subjective conjecture - keeping in mind the limitations inherent in such an estimate.

The juvenile steelhead collected in the Upper Mill Creek, Lower Mill Creek, and the tributary sampling stations averaged 2.2, 3.3, and 2.4 inches total length, respectively. The overall range in total lengths was 1.3 to 6.1 inches. The average weight was about 2.5 grams per fish by volumetric displacement.

Water temperatures ranged from 60 to 62° F. Stream flow at the Lower Mill Creek station (downstream from the tributary) was 0.092 cubic feet per second. A Cipolletti Weir was installed at this location. Periodic water depth (head) readings at the weir revealed a gradual decrease in stream flow to 0.03 c.f.s. by mid-July and a break in surface hydrologic continuity by mid-August. Underflow was sufficient to keep pools cool and fresh throughout September. Cooling weather and light rains resulted in a flow of 0.03 c.f.s. by mid-October, when the weir was removed.

Summary of fish population data available regarding the steelhead resource of the streams influenced by the proposed project:

Mill Creek

2.7 miles of stream available to steelhead
55 SH/100 ft. of stream (based on population sampling)
7,700 juvenile steelhead standing crop, June 1969.

Anderson Creek

7.0 miles of stream available to steelhead
(5.5 miles available upstream from dam site)
100 SH/100 ft. of stream (visual survey estimate)
36,400 juvenile steelhead standing crop, June 1969.

Soda Creek (tributary to Anderson Creek)

1.0 mile of stream available to steelhead
150 SH/100 ft. of stream (visual survey estimate)
7,800 juvenile steelhead standing crop, June 1969.

Robinson Creek

Small, isolated populations of resident rainbow trout. No apparent steelhead usage.

Total estimated June standing crop in project streams

51,900 juvenile steelhead

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