

State of California

The Resources Agency

Memorandum

To : Regional Manager, Region 3

Date: July 3, 1972

From : Department of Fish and Game
Water Pollution Control Lab

Subject : Soda Creek, Mendocino County-Fish Kill
Investigation Analytical Results

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Water and fish samples collected during a fish kill investigation on Soda Creek, Mendocino County were delivered to the WPCL on May 18, 1972 for analyses. Description of the samples are as follows :

Sample #1 - Collected, on May 11, 1972 at 12:20 p.m. from Soda Creek at Soyster Ranch. Sample of water from hole at the confluence of Soda Creek and Bell Valley Creeks believed to contain a large amount of copper sulfates.

Sample #2 - Collected on May 11, 1972 at 11:30 a.m. at approximately 100 feet upstream from Sample #1 on the east side of culvert under Soyster Ranch Road. Possible copper sulfates in sample.

Sample #3 - Collected on May 11, 1972 at 11:35 a.m. at approximately 100 feet upstream from sample #2. This sample not believed to contain any copper sulfates.

Sample #4. - Collected on May 11, 1972 at 11:48 a.m. from Bell Valley Creek at north end of culvert, approximately 50 feet north of confluence with Soda Creek.

Sample #5 - Four dead rainbow trout from Soda Creek pond below dam.

Sample #6 - Twenty rainbow trout from Soda Creek.

The water samples were analyzed for both total copper and dissolved copper concentrations. The following are the results of our findings;

WPCL#	Identification #	Dissolved Copper ppm	Total Copper ppm
L-569-72-1	Sample #1	17.	37.
L-569-72-2	Sample #2	0.10	0.46
L-569-72-3	Sample #3	0.00	0.00
L-569-72-4	Sample #4	0.00	0.00

The concentration of dissolved copper found in water Sample #1 and Sample #2 are above the reported 96-hour TL_m 0.02 ppm and would cause rapid fish mortalities.

The gill tissue of the dead rainbow trout collected from Soda Creek were analyzed for copper with the following results :

WPCL#	Description of Samples	No. in Comp.	Ave. Wt.	Ave. Lgth.	Copper ppm
L-569-72-5	Four dead rainbow trout from Soda Creek below darn.	3	127 gr.	22 cm.	1200
L-569-72-6	Twenty rainbow trout from Soda Creek.	6	64 gr.	17 cm.	24.

The copper concentrations found were reported on a dry weight basis. The average copper levels found on rainbow trout gill tissue taken from the hatcheries is 7-8 ppm. The 1200 ppm of copper found in the three fish composite is a definite indication that those rainbow trout had been subjected to high concentrations of copper.

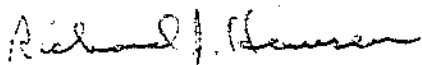
In addition to the chemical tests, acute toxicity bioassay tests on the four water samples were conducted at the Water Pollution Control Lab. Due to the small quantity of sample collected, standard bioassay procedures to determine the median tolerance limit (TL_m) were not possible. Bioassays were performed on samples as submitted to the laboratory with no dilutions made.

Regional Manager, Region 3
July 3, 1972

-3-

Temperature of samples were equated to 15°C before adding three king salmon fingerling to each of the four samples. Dissolved oxygen was maintained above 5 ppm. All fish in Sample #1 were dead within 1 1/2 hours. No mortalities occurred in the other three samples during the 96-hour test period.

The analytical results obtained, in the chemical and biological tests lead us to conclude that the trout collected from Soda Creek pond below the dam were killed by a lethal concentration of copper.



Richard J. Bansen
Laboratory Director

RJH:gl

cc: K. Bain