

Franz Creek

Warden Tom Kasnick

August 30, 1983

- Region 3

Franz Creek, Sonoma County - Fish Kill and Pollution Incident

On August 3, 1983, you requested that I investigate a reported fish kill and water pollution incident on Franz Creek near Franz Valley School Road. I arrived at the creek at about 1500 hours and found at the Franz Valley School Road bridge and downstream of the Kettle well swimming hole that the stream was highly discolored, the color being that of strong tea. I also found several dead trout ranging from 2½-3" long (young-of-the-year) to 6-8" long (one year or older) and one individual about 12" long.

I traced the discolored water upstream to a fork one-tenth of a mile above the Franz Valley School Road bridge. The mainstem (or western branch) of the creek was clear of discoloration, the smaller tributary forming the east branch was discolored. I followed the stream through the Blakeley property, but could find no discharge points (I suspected a winery discharge). I met Ed Blakeley at his house and explained the situation, asking if he knew of any wineries in the watershed. He said he did not, but offered that the problem may be with his father's pile of chicken manure, He said that the manure pile had caught fire by spontaneous combustion, and in the preceding few days sprinklers had been set up to put out the fire. He gave me directions to the manure site.

I found that the manure pile, consisting of about 150 to 200 cubic yards, was located within about 18 feet of the stream. A track was readily visible where leachate from the manure pile had flowed into the stream. Above the point where the leachate entered the stream, the stream was not discolored and live fish were present.

On August 4, I returned to Franz Creek with you and Sue Mann of our Water Quality Lab. After showing you the site and while you and Ms. Mann collected water quality samples, I surveyed the stream by electrofishing to assess the impact on aquatic life. Nine sampling sites were established, each site being a measured 50 feet long (except one at Franz Valley School Road bridge which was 150 feet long). Each site was electrofished in a single pass from the downstream end. All fish and crayfish were counted as they were stunned. A count made on only a single pass would give a highly conservative population estimate. Dead organisms within each site were counted, but the data has little meaning as the water was so turbid as to make it hard to see the bottom (live fish were still easy to see as they came to the surface when stunned and rolled over, flashing silver), and raccoons would have removed

most of the dead fish (several sets of raccoon tracks were seen). Sampling sites are shown on the attached map.

Highly discolored water was found as far downstream as site #7; a slight discoloration was found at site #9. A few dead and dying fish were found in and near site #9; these are believed to be fish that were stressed from upstream which had drifted down.

Electrofishing results by site:

13 y-o-y (young-of-the-year) trout  
6 1+ (one year or older) trout

40 y-o-y trout  
1 1+ trout

1 dead y-o-y trout  
2 dead riffle sculpin  
1 dead crayfish

5 dead y-o-y trout

26 y-o-y trout  
10 1+ trout  
4 riffle sculpin  
1 crayfish

1 y-o-y trout (150-foot section)  
1 riffle sculpin  
5 dead y-o-y trout

17 y-o-y trout  
2 1+ trout  
1 riffle sculpin  
1 green sunfish

10 y-o-y trout  
5 1+ trout  
18 western roach

13 y-o-y trout  
3 dead y-o-y trout  
22 western roach

sites #3 and #4 show that all fish in the east branch below the discharge point (0.3 mile) were killed. If sites #1 and #2 are assumed to be typical of the lower reach, the stream supported 53 y-o-y trout and 7 1+ trout (total 60 trout) per 100 feet. The loss in this reach of stream was, therefore, 950 trout (60 trout/100 ft x 0.3 mile x 5,280 ft mile).

For the mainstem portion of Franz Creek, the results of electrofishing at sites #5, 7, 8, and 9 were averaged to determine the carrying capacity of the affected portion of that reach of stream -- 33 y-o-y trout and 6 1+ trout (total 39 trout), 20 roach, and 3 sculpin per 100 feet. The mortality at least as far downstream as the Kettle well swimming hole (0.3 mile below the confluence of the east branch) was complete for a loss of 618 trout (39 trout/100 ft x 0.3 mile x 5,280 ft/mile), 317 roach, and 48 sculpin.

In the 0.45 mile reach from Kettle well swimming hole to site #7, the mortality declined from 100% to a low level (I'll assume zero); therefore, I'll assume a 50% mortality over that reach. The fish loss is then 463 trout (39 trout/100 ft x 0.45 mile x 5,280 ft/mile x 50% mortality), 237 roach, and 36 sculpin.

My total estimated loss for this incident is 2,031 trout, 554 roach, and 84 sculpin. In addition, there were some crayfish, tadpoles, and aquatic insects which I was not able to enumerate. I feel this estimated loss is very conservative.

#### ECONOMIC LOSS

The economic loss resulting from a fish kill may be determined from the replacement costs for the species involved plus an estimation of the value to consumptive and non-consumptive users of the fishery resource and the value to the public at large derived from the knowledge that those organisms are there. In this case, only the replacement costs and values to consumptive users will be evaluated. There has nonetheless been a loss to local residents as non-consumptive users.

#### REPLACEMENT VALUE

Purchase price of rainbow trout at Smith's Mt. St. Helena Trout Farm is \$0.24 each for 4-inch fish when purchased in lots of 1,000. Therefore, the value of trout killed is:

$$2,031 \text{ trout} \times \$0.24/\text{trout} = \$487.44$$

Purchase price of mosquitofish, which may be comparable to western roach, at Funez Brothers Fish Farm in Sebastopol is \$0.20. Therefore, the value of roach is:

$$554 \text{ roach} \times \$0.20/\text{roach} = \$110.80$$

Purchase price of yellow bullhead, which may be comparable to riffle sculpin, at Funez Brothers is \$0.50. Therefore, the value of sculpin killed is:

$$84 \text{ sculpin} \times \$0.50/\text{sculpin} = \$42.00$$

The total replacement value of the fish kill in Franz Creek due to the runoff from the chicken manure, excluding that for consumptive and non-consumptive uses and existence value, is:

|                         |              |
|-------------------------|--------------|
| Trout                   | \$ 487.44    |
| Western roach           | 110.80       |
| Riffle sculpin          | <u>42.00</u> |
| Total Replacement Value | \$ 640.24    |

## CONSUMPTIVE VALUE

The loss of consumptive value as a result of the kill in Franz Creek would be on the steelhead trout as they returned from the ocean. The economic loss would be determined by the rate of survival to adult, the percentage of returning adults caught, the value of an angler day (i.e., how much the average angler would be willing to spend for a day of river fishing for steelhead) and the number of days required for the average angler to catch a steelhead.

In a 1970 report, "Economic Evaluation of 1967 Sport Fisheries of Washington", for the Washington Department of Fisheries, Mathews and Brown reported that steelhead anglers were willing to pay \$32 per day to fish in rivers; updated to 1983 values, this is \$88.64. Nine years of study on Waddel Creek by Leo Shapovalov showed a survival rate to first spawning of 2.5%. Studies on the upper Sacramento River by Richard Halleck over the last several years show that an average of about 1% of adult steelhead returning to the river are caught by anglers. Studies from Washington, Oregon, and California show that 2.5 to 4 days of angling effort are required for each steelhead caught. This area is at the high end of the range while more northerly areas are at the low end of the range.

Consumptive value lost is, therefore:

$$(2,031 \text{ juvenile steelhead lost}) \times (0.025 \text{ return rate as adults}) \times (0.01 \text{ catch rate of returning adults}) \times (\$88.64 \text{ willingness to pay per day}) \times (4 \text{ angler days effort required per fish caught}) = \$180.03.$$

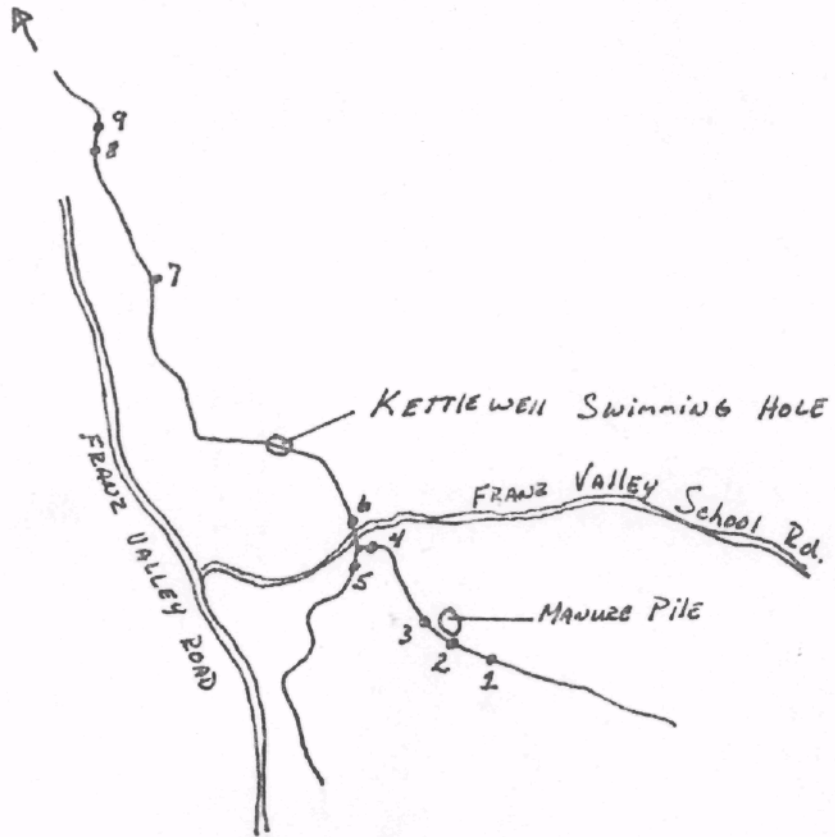
The total economic loss in Franz Creek from the fish kill caused by run-off from the chicken manure pile is \$640.24 for replacement value and \$180.03 for loss of consumptive value for a total of \$820.27.

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Region 3

WGC:tf

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# FRANZ CREEK



2 } — ELECTRO-FISHING SITES

1 MILE