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Results of Investigation of Fish Kill - Petaluma River,  
Sonoma - Marin Counties

On June 14, 1961, the fish kill in the Petaluma River was reported to Warden George Nelson by the Skipper of the "Sea Scouts" Mr. Curly Acorn. Mr. Acorn reported that striped bass averaging 10 inches in length were observed dead in large numbers throughout the entire Petaluma River.

Warden Nelson reported this fish kill to Captain Shea, but Warden Nelson felt that the kill was a normal condition brought about by extreme hot weather accompanied by a minus tide. This type of fish kill has happened in previous years whenever these two conditions happen simultaneously. Having received Warden Nelson's report, Captain Shea reported this situation to the regional headquarters' office.

On Saturday, June 17th, this writer received a telephone call from Mr. Walt Christensen, outdoor writer for the local Press Democrat. He wanted to know all about the fish kill and thought that it may have been caused by pollution from two tallow works which are located on Petaluma Creek. His thinking was brought about because of the increased number of dead chickens in the area due to the hot weather. These chickens are utilized by the tallow works. After talking with Mr. Christensen, this writer then contacted the addressee to determine if the situation should be investigated. The addressee thought the situation should be looked into; therefore, two investigations were conducted.

The first investigation was conducted on the afternoon of June 17th. This writer, in the company of Warden George Nelson, checked out four spots along the Petaluma River which might give some indication as to whether or not the first kill was caused by pollution. The points checked were:

1. The Petaluma River at Black Point.
2. Gentilly's approximately half way between Hack Point and Petaluma.
3. The outfall of the Royal Tallow Works.
4. The River in the area 800 yards downstream from the Washington Street Bridge at Petaluma.

In this investigation, surface dissolved oxygen and temperatures were recorded. The number of dead fish in each area was also recorded.

The results of this first investigation are found in the attached Table No. 1.

The second investigation was conducted on June 19th by this writer and Warden George Nelson. However, during this investigation a more comprehensive search was undertaken.

The area investigated ranged, from 200 yards upstream from the Washington Street Bridge, downstream to the Petaluma River at Black Point, a distance of approximately 12 miles. This stretch of the River was covered by boat and a series of dissolved oxygen temperatures were taken at the four stations. Number of dead fish was also recorded.

The results of the dissolved oxygen temperature recordings are found in the attached Table #2.

The number of dead fish counted were 150 striped bass, Roccus saxatilis, averaging 10 inches in length were counted in the entire river. No other species were found to be dead.

The results of these investigations seemed to indicate that the dissolved oxygen was lower two days previous to the investigation on June 19th. This may be an indication that the dissolved oxygen was much lower four days previous to Saturday, which was Wednesday, June 14th, the day after an extremely hot day. The D.O.'s do not appear to be as high as one would expect. On Saturday when the air temperature was 68° and the water temperature was 75° and yet the D.O. had a highest reading of 5.4. Heavy winds were blowing at the time the dissolved oxygens were recorded. Out of pure curiosity, the D.O. was taken 10 yards downstream from the sewage outfall from the sewage plant in Petaluma. This reading registered 6.6 parts per million, which was more favorable than this writer had expected. It is of real interest to note the high dissolved oxygen recorded on the surface at Station #4 in Petaluma. Evidently, this water is supersaturated with oxygen which could be seen by the numerous small bubbles in the sample of water which was taken on the surface. Why the sudden change within five feet is unknown except that the possible presence of stratification due to salt and fresh water could have caused this demarcation as radical as 19 ppm. (Just to prove if this reading was correct, a sample was taken and fixed and hydrated at the Santa Rosa sewage treatment plant the following day. A similar recording was registered there.) Two water samples were also taken in the vicinity of the Royal Tallow Works' outfall, one was taken in the immediate area of the outfall, and another approximately 50 yards upstream from the outfall because the tide was moving in. All in all, it is felt by this writer that this fish kill in the Petaluma River was the result of hot weather, low tide, a large plankton bloom on a hot Tuesday causing an oxygen deficiency during the night producing the fish kill observed on Wednesday morning.

From this investigation, it can be concluded that there was a fish kill of some magnitude in the Petaluma River on Wednesday, June 14th, and that the fish were killed by oxygen-deficient water.

It is recommended that a surveillance of this area be undertaken for an extremely high temperature accompanied by low tides.

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Petaluma River  
Fish Kill report

TABLE 1

FISH Kill Investigation Results  
Petaluma River - 6/17/61

Station No.	D.O.	H <sub>2</sub> O Temp.	Time	Remarks
1	Surface 5.0, 5.2, 5.4 ppm	76°F	1530	13 dead striped bass - Ave. 10" water turbid - slight wind
2	Surface 4.8 ppm	75°F	1600	11 dead striped bass - Ave. 10" Air temp 67°F - Windy
3	Surface 1.8 ppm	77°F	1700	No dead fish - Air temp 67°F
4	Surface 5.0 ppm	76°F	1730	No outfall flowing into river

Station #1 - Petaluma River - Blackpoint

" #2 - Gentilly's Boat Ramp about halfway from Blackpoint to Petaluma

" #3 - Petaluma, 300 yds d/s from Washington St. Bridge

" #4 - Outfall location of Royal Tallow Works, Petaluma

Petaluma River  
Fish Kill Report

## TABLE 2

D.O. - Temp. Results vs Fish Kill Petaluma  
River  
6/19/61

Depth	Station 1	Station 2	Station 3	Station 4
0	77°F 5.8 ppm	78°F 6.8 ppm	78°F 6.6 ppm	78°F 20.8 ppm
5 ft.	77°F 5.6 ppm	76°F 6.6 ppm	-	76°F 2.2 ppm
9 ft. (1 ft. from bottom)				75°F 0.2 ppm
12 ft. (1 ft. from bottom)		72°F 4.2 ppm		
15 ft. (1 ft. from bottom)	76°F 5.0 ppm			

Station 1 = Petaluma River Blackpoint

" 2 = Gentilly's Boat Ramp: about half way from Blackpoint to Petaluma

" 3 = 10 yds below Petaluma Sewage Plant outfall

" 4 = Petaluma 800 yds N/S from Washington St. bridge