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INSTITUTE FOR FISHERIES RESEARCH  
UNIVERSITY MUSEUMS  
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REPORT NO. 374

EFFECT OF BEAVER DAM REMOVAL UPON TROUT FINGERLINGS  
AT THE FOX RIVER STATION

During the first week in May of this year, 28 beaver dams were removed from the Fox River which supplies the trout rearing ponds of the Fox River Station. Within one week of the removal of these dams, brook trout fingerlings were sent to the station from the Thompson Hatchery, shipments being concluded by the 15th of the month. Although the trout had been exceptionally vigorous and healthy up to the time they left the hatchery, they began to die in increasing numbers as soon as they arrived at the Fox River Station. The mortality mounted daily until of the 200,000 fish affected 7,100 had died by the end of May, and an additional 18,000 by the 9th of June. The mortality reached a peak on June 6 when 3,360 dead fish were counted. The epidemic still continues at the time of this writing (June 10), but has begun to abate somewhat.

When the writer arrived at the station on June 3 the water of the Fox River was so roily that the fish in the ponds could not easily be seen. According to Mr. Squires, who was in charge of the station, this condition had existed ever since the removal of the beaver dams, and was gradually subsiding. By June 9th the water was almost clear but the bottom of the ponds contained a thick layer of flocculent black sediment which had been carried down from the dams.

The epidemic was confined entirely to ponds 3 and 4 of the station. Ponds 1 and 2 are fed partly from a clear spring which flows about 700 gallons per minute, and partly from the river. Ponds 3 and 4 are fed entirely from the river below the outlet of ponds 1 and 2. Presumably on account of the spring water the fish in ponds 1 and 2 escaped injury. Pond 1 is constructed in such a way that the spring water enters near

its foot, and Mr. Squires reports that for the first two weeks of their occupancy of this pond the fish remained near the foot and in the spring water. By June 5 they no longer stayed in this position but moved up into the head of the pond into the undiluted river water, so that it may be concluded that the river water was by this time no longer injurious to them. Yet the mortality in ponds 3 and 4 had not yet abated by this date.

Examination of a number of helplessly drifting fish from pond 4 did not reveal any parasites or any known hatchery disease. Their gills appeared normal, and the intestines contained some wild food organisms as if the fish had tried to feed up to the end. They took very little interest in the food which was thrown into the ponds, however. No characteristic movements or gyrations took place in the dying fish.

In order to find out whether the fish had been injured by the beaver dam sediment and its accompanying chemical effects or by some pathogenic bacteria, three screen boxes, each containing 100 healthy fish from pond 1, were placed as follows: one in the undiluted river water at the head of pond 1, one in the spring water above pond 1, and one at the foot of pond 4. If the fish in the third situation become diseased and not those in the first, it will be fair to conclude that some new bacterial disease, rather than a toxic water supply, has caused the mortality. This experiment was set up on the evening of June 8, and no data regarding it is yet available.

It is a significant fact that the wild trout seem to have been driven out of the Fox River by the removal of the dams. Local fishermen report no fishing this season as compared with pretty fair catches in previous years. During the time the writer spent at the station, one expert fisherman fished a mile of the stream carefully but caught nothing. The same day he caught eight trout in a nearby stream.

While at the present writing the trouble is apparently subsiding, it is to be expected that a heavy rainfall will bring more sediment and perhaps aggravate the mortality once more. At present nothing can be done to prevent this. But while this particular situation will probably never again occur at this station, there are, nevertheless, several matters about the ponds which might well be improved. These matters are as follows:

1. The spring water should be conducted into the head of pond 1 rather than, as at present, into its foot.

2. There should be a sluice connecting pond 2 directly with pond 3 so that ponds 3 and 4 may also have the advantage of the spring water. The present connections for taking water directly from the river into pond 3 should be continued in addition to the proposed sluice.

The problem of the specific effect of the removal of old dams upon fish life has already received considerable attention from the Institute (Report 240). Possibly the effects in the case here described were produced by a lowering of the oxygen content of the water in consequence of the sudden release of a large amount of partly decomposed organic matter into the stream. But the continued death of the fish, even after the stream has almost regained its normally clear condition, indicates that some directly toxic agent had been released into the water. Fish which die of suffocation frequently show distended operculae and gill arches, and die with their mouths open. None of these symptoms were observed in the Fox River fish. Nor were any foul odors noticed in the water at any time during the fish mortality. While it is possible that the fish may have been injured by a lowering of the pH of the water (Report 240), it seems doubtful that such injury could continue for so long a period after the removal of the dams. No coagulation of the slime, in consequence of extremely low pH, was noticeable during the writer's investigation at the station. It is obvious that a number of problems connected with beaver dam removal might well be given further attention by the Institute.

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By: Louis E. Wolf

Addendum to Report on Fish Mortality at  
Fox River Trout Feeding  
Station

In a letter dated June 15 Mr. Stanley Shust, of the Thompson Hatchery, states that the mortality of the fish in the Fox River Station has continued to drop and that

the fish are once more beginning to take a normal interest in their food. He also states that as none of the fish in the screened boxes died all the boxes were removed and the experiment discontinued on June 15.

The fact that none of the healthy fish from Pond one died when placed either in the pure creek water or in the creek water at the foot of pond 4 shows that by the time the experiment was started the water was no longer inj<sup>u</sup>rious to the fish, and also that there was very probably no bacterial infection of any sort present. Even though fish were still dying in pond 4 none of the experimental fish placed therein contracted any sort of malady.

We can only conclude that the entire mortality was a result of some toxic matter being released into the stream by the removal of the beaver dams.

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