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INSTITUTE FOR FISHERIES RESEARCH  
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EXAMINATION OF DEAD BROOK TROUT FROM DR. J. CLINTON FOSHEE'S ESTATE,  
GRAND RAPIDS

On November 21, 1934, 5 brook trout were received from Dr. J. Clinton Foshee, Lorraine Bldg., Grand Rapids, during a visit to Dr. Foshee's trout stream a few miles east of Grand Rapids. A single specimen was received on November 24. Dr. Foshee's estate encloses about 1/4 mile of a small stream which originates as a spring on his grounds and has a flow of about 60 g.p.m. The normal bed of this stream is about 2 to 3 feet wide and 2 to 3 inches deep. Three ponds have been made by damming the stream, the upper pond being several hundred feet below the origin of the stream. These ponds are, roughly, 30 to 40 feet long, 10 to 20 feet wide and 3 to 5 feet deep. About 160 brook trout, of the size range represented by the following six specimens are confined to the two upper ponds and the sections of stream above them. On November 21, spawning trout were numerous in the stream above the ponds.

The trout were fed liver, bread, etc. according to Dr. Foshee.

3 dead trout were found on November 19, 4 on the 20th, and 5 on the 21st. The latter were obtained. The last specimen received apparently died sometime between the 21st and 24th.

Data on these six fish are included in the following table.

Table 1.

Specimen No.	Sex & Condition	Age years	Color condition	Stomach contents	Total length inches	Comments
1	Male spent	3	Brilliant spawning colors	31 trout eggs	9 1/4	Emaciated; poor condition and spawning were probable causes of death.
2	Male spent	2	"	Large piece of liver	8 3/4	Injury marks, almost certainly the marks of teeth or claws of some animal.
3	Female, partially spent	3	"	8 trout eggs	8 3/4	Gill injury causing a pre-lethal fungus infection over body.
4	Female spent	3	"	Stomach empty	8 1/2	Deep gash on side behind the dorsal fin.
5	Female spent	2	Color dull, possibly a nutritional deficiency	Small piece of liver	8 1/4	Injury marks, almost certainly the marks left by teeth or claws of some animal.
6	Male spent	2	"	21 trout eggs	8 3/4	Apparently good condition, no injuries. Death probably a post-spawning mortality.

Since the stomachs of these six fish contained liver in two instances, trout eggs in three instances, and the remaining stomach was empty, the possibility of these fish dying from some poisonous food seems remote. Since the span of the life of the brook trout is about 5 years, the death of these fish can hardly be attributed to old age. It is our belief that the death of trout in this stream has been due to a combination of at least two factors. Post-spawning mortality has been recognized to be high in the salmonoid fishes in general. The strenuous efforts of the fish during the spawning season greatly reduces its vitality, and the fish is unusually subjected to injuries at this time. Such fish often become emaciated by the end of the spawning season, as was the case of specimen number 1 in the above table.

The section of this stream in which the trout are spawning is abnormally small for trout as large as those in the stream. The fact that I was able to catch two of these 8 to 9 inch trout with my hands strongly suggests that they are easy prey for prowling quadrupeds. Three of the six specimens examined had external injuries, and two of these three cases were definitely due to the teeth or claws of some animal, probably a prowling house-cat, a mink or raccoon. From the examination of

of these specimens we believe that the loss of brook trout has been due mostly to these two factors: post-spawning mortality and predatory mammals. None of the external scars on these fish could be identified as the work of predatory birds.

Relative to the large numbers of trout eggs contained in the stomachs of three of the trout, a word of explanation seems necessary. Normally trout lay their eggs at the bottom of a pocket which the fish has made in the gravel on the stream bottom. After deposition of the eggs they are immediately covered with gravel by the fish. Stray eggs floating from the nest before they are covered are often eaten by other fish. This is not a serious matter however, since these stray eggs probably would not hatch anyway. It is quite probable that these 8 to 9 inch trout, spawning in water less than 3 inches deep, have difficulty in excavating a deep nest or in covering the eggs, and an abnormally large number of the eggs are lost. During my observations on the stream I observed no large, well-defined nests similar to those which are typical in other streams made by trout of this size.

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