

Original: Fish Division

cc: Dr. Leonard

Education-Game

Mr. Hamlin

**INSTITUTE FOR FISHERIES RESEARCH**

DIVISION OF FISHERIES

**MICHIGAN DEPARTMENT OF CONSERVATION**

COOPERATING WITH THE

**UNIVERSITY OF MICHIGAN**

Mr. Iverson

Mr. Fortney

Mr. Peterson

Mr. Dockham

Mr. Kelso

Mr. Aldrich

Mr. Allison **ADDRESS**  
**UNIVERSITY MUSEUMS**  
**ANN ARBOR, MICHIGAN**

**ALBERT S. HAZZARD, PH.D.**  
**DIRECTOR**

August 7, 1940

REPORT NO. 610

REPORT OF INVESTIGATION OF BROWN TROUT MORTALITY

IN THE WEST BRANCH OF BIG CREEK, VICINITY OF LUZERNE, THE AU SABLE,

VICINITY OF MIO, AND THE PERE MARQUETTE RIVER, VICINITY OF BALDWIN

by

Leonard N. Allison

On the morning of July 23rd, Officer Dockham of Mio took me to several points on the West Branch of Big Creek and Big Creek near Luzerne where the mortality had occurred. We saw no sick or dead fish from the bridges. We returned to Luzerne and talked to Jack Sweighardt at Jack's Tackle Shop about his observations this year. He reported little or no loss on the East Branch but a considerable one on the West Branch. Both men were of the opinion that pollen or weed seeds caused the mortality. Jack caught specimens of healthy brown trout from the pond at Luzerne and I took blood smears and preserved the internal organs for sectioning. Since there has been no disease in the East Branch, these fish are probably not afflicted with the West Branch "disease" and can be used for comparison with tissue from dead West Branch fish. The average temperature of the East Branch is lower than that of the West Branch. This may have some influence in limiting the mortality to the West Branch.

I returned Officer Dockham to Mio, went back to the spots designated by him and spent six hours on the West Branch and Big Creek proper. I found two dead brown trout (7" and 14") on the West Branch and none on Big Creek. No sick fish were seen.

Mr. C. E. Hamlin of Jackson, Michigan, who owns a cottage on the West Branch just north of Luzerne and has fished the stream for many years, stated that he had not noticed as many dead fish this year as he saw last year. Mr. Hamlin also said that the mortality began abruptly at the bridge due west of Luzerne. I examined the stream for some distance above this bridge and found one dead thirteen-inch brown trout about fifty yards above the bridge. Mr. Durfee has several cottages just above the bridge but there was not sufficient evidence of pollution present to be detrimental to fish life, as the abruptness of onset might indicate.

A fisherman at the Luzerne pond in the East Branch of Big Creek said that he thought rose-bugs (Macroductylus subspinosus) might be killing the trout because he knew that young ducks were killed when they ate them. Jack Sweighardt agreed that it might be possible since rose-bugs had been especially abundant last year and this year. He had tied a fly to look like one and caught brown trout with it. Dr. Leonard at the Hunt Creek Experimental Station said that he had encountered these insects in the stomachs of apparently normal and healthy brook and rainbow trout.

At Grayling, Mr. H. L. Peterson took me to several points on the Au Sable but no sick or dead fish were seen. Mr. Peterson had observed the sick fish closely and described their behavior as an erratic darting about, whirling, gasping at the surface of the water and periods of resting on the bottom. He had observed a similar behavior of brown trout at the hatchery after the fish had gorged themselves on grass seeds. On dissection of sick and dead fish, Peterson found the stomach empty of food but containing a thick, yellow mucous. The fish that I dissected confirmed

Peterson's observations. The intestine did contain food material, indicating feeding activity until shortly before death.

The peculiar behavior described by Peterson has not been observed in the Pere Marquette River, although many sick fish have been seen there. The sick brown trout in the Pere Marquette are said to lie quietly near the bottom in eddies behind some obstruction and in slowly moving waters. They seem to be entirely uninterested in the environment and can easily be picked up by hand. This may indicate inadequate observations and be the last stage as described by Peterson, or it may be a different sickness.

On the Pere Marquette River I cruised several stretches of the Middle Branch, South Branch and the Main River below Bowman's bridge. I found only two dead brown trout and they were poor specimens. Mr. Karl Kidder and I rode about one mile on the Pere Marquette River, west of M37 highway, in a canoe loaned to us by Mr. Brannon, caretaker of the Pere Marquette Club. We saw no sick or dead fish.

The first report of mortality came to Baldwin Conservation Headquarters on July 8th from Roller's Bridge, Middle Branch. At the present time, July 25, the mortality has nearly ceased, only an occasional sick or dead fish being found.

This mortality appears to be specific to brown trout since dead specimens of other species of trout are only rarely encountered during its period and the majority of these other species are just under legal size and probably represent "hooking loss." Although Mr. Brannon states that he has observed a kill of brown trout on the Pere Marquette River at this time of year for many years, it has only recently suddenly increased to large proportions and an extensive range.

On the basis of the data for the past two years, it was suggested by Dockham, Peterson, and Kidder that an investigator be on the job next year beginning the last week in June until the end of the second week in July. By so doing, the mortality would be observed from the beginning, specimens would be readily available and environmental conditions noted.

A solution to this problem is not now at hand in spite of several theories advanced. The pollen-seed theory is substantiated by Peterson's hatchery experience but, except for some extensive changes in the environment of the streams, the seeds and pollen were there before these mortalities began.

The rose-bug theory has no substantiation except that rose-bugs seem to have been more numerous during the past several years at this time of the year.

It has also <sup>been</sup> ~~be~~ suggested that exuviae of may-fly larvae eaten in large quantities by brown trout may be toxic to them. Blood smears taken last year of a sick trout at Baldwin exhibited anemia. This might be caused by a dietary deficiency of some kind, possibly prolonged feeding on food lacking in certain elements.

The problem is a complex one and more observations of food habits just prior to and during the mortality, and specimens of sick fish are essential to its solution. A histological comparison is being made of sections of the internal organs of dead and healthy fish in an effort to detect any pathological changes that might indicate a specific disease. This study will be reported when completed.

Dr. Hazzard brought two specimens of brown trout (approximately 10 and 15 inches) to me that were collected by a party consisting of himself

and W. A. Elkins and E. S. Iverson of the U. S. Forest Service on July 27 in the Pere Marquette River, T. 17 N., R. 14 W., Sect. 12, and T. 18 N., R. 14 W., Sect. 30. These trout exhibited external ulcers and pustules which he thought to be Furunculosis. Bacteriological examination confirmed his opinion.

INSTITUTE FOR FISHERIES RESEARCH  
A. S. Hazzard, Director

By: Leonard N. Allison  
Pathologist