

INSTITUTE FOR FISHERIES RESEARCH
UNIVERSITY MUSEUMS
UNIVERSITY OF MICHIGAN
ANN ARBOR, MICHIGAN
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BY CARL L. HUBBS

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During the greater part of the biennium, the investigations of the lakes and streams and of the fish life of the state were carried on by the biological staff of the Department. In February, 1930, by arrangement with the University of Michigan, the fishery research work of the state was taken over by that institution. The Regents of the University established ~~as~~ a new unit for this purpose, known as the Institute for Fisheries Research. The funds for the operation of the institute are provided largely by the Department of Conservation. Additional financial assistance, for special work on the productivity of inland lakes, has been furnished the Institute by the Isaac Walton League of America.

The biological staff of the Division of Fisheries, prior to the organization of the Institute for Fisheries Research, consisted of Dr. Jan Metzelaar and Mr. Thomas H. Langlois. Mr. Langlois, ranking as Fish Pathologist, carried on investigations into the disease of fish, especially in the hatcheries. He also assisted the United States Bureau of Fisheries in an investigation of effects of the fishing gear used in Saginaw Bay. He also carried on some lake and stream survey work, and some special biological problems, as the food of the gar. Mr. Langlois has recently been placed in charge of the fish hatcheries of Ohio.

Dr. Jan Metzelaar faithfully carried on fish investigations until October 4, 1929, when he was drowned in Grand Lake, Presque Isle County. Dying on duty, he became before his thirty-eighth year a martyr to science and conservation. He came, well trained, to America, and to his position as Fishery Expert for the Department, in November 1923. He carried on his labors with a tremendous

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enthusiasm, too real to doubt. His staunch loyalty to his associates and to the state, and to his adopted country, of which he became a citizen just two ^{days} ~~years~~ before his death, made for him a host of friends.

Dr. Metzelaar's work during the biennium covered by this report included the vigorous continuation of the lake and stream survey of the state; a thorough study of the food and inter-relations of the three species of trout; a study by tagging experiments of the migrations of trout; a study of the age, growth, food and proper environment of the wall-eyed pike; a study of the improvement of trout streams by the introduction of snags, and numerous minor investigations. The work of Dr. Metzelaar laid a foundation on which the current investigations are being built.

The fish and fishery investigations have been in Michigan materially expanded since the organization of the Institute for Fisheries Research of the University of Michigan under the direction of Dr. Carl L. Hubbs. The work of the Institute may be briefly summarized under several headings.

1. Hatchery diseases. Much attention has been given to an investigation of the diseases of fish in the various fish hatcheries and rearing stations. The epidemics which have developed have been diagnosed, and some progress made in determining methods of treatment. Several new fish diseases, of a bacterial nature, have been discovered. This work has been done by Wendell H. Krull, Fish Pathologist.

2. Death of fishes in natural waters. Numerous investigations have been made to determine the cause of fish mortality in nature, by Mr. Krull and Dr. Hubbs.

3. Health conditions in hatcheries and rearing stations. Some time has been available for observations on the chemical, sanitary and productive and operative conditions of existing, proposed and possible hatcheries or hatchery sites, and rearing stations. This work has also been done by Mr. Krull and Dr. Hubbs.

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4. Lake and stream survey. A more detailed lake survey was conducted in 1930 than in previous years. A party of three to eight men, under the immediate charge of R. W. Eschmeyer, made a study during the summer of all the lakes in Kalkaska County. This work was made possible by the very substantial financial support given by the Michigan chapter of the Isaac Walton League. Maps were prepared showing the depths, the vegetations and the bottom material of each lake. The water was investigated at different depths as to temperature, color, transparency, dissolved gases, alkalinity, hardness, etc. The fish life and fishing conditions were determined for the present season, and as far as possible for previous years. From these data, recommendations for the fish management of the lakes is to be made. The several men trained in this work will be available for further lake surveys and for more detailed investigations of means to increase the fish productivity of lakes. Similar work, developing into the special problems, is being continued over the winter about Ann Arbor. A survey was made by Dr. Koelz of all the lakes in Isle Royale.

Some stream survey work was also done, in Lake, Manistee, Kalkaska, Livingston, Washtenaw and other counties, by Dr. Hubbs and Dr. Greeley.

5. Species of ciscoes. The investigation of Walter Koelz on the species of ciscoes on lake herring inhabiting the inland lakes, was completed during the short period when Dr. Koelz acted as Ichthyologist of the Institute.

6. Fish Predators. Much work has been done on the food of fish enemies, and their effect on the fish supply. The investigation of the effect of the terns and gulls on the commercial fisheries of Saginaw Bay was continued and carried well toward a conclusive end by Cannto Manuel. The services of another man, J. Clark Salyer, have been obtained to study the effects of enemies of trout and other game fishes, and the need for and possibilities of the control of fish predators.

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7. Trout migrations. The experimental investigation of the movement of trout, by the tagging method, has been actively continued. Further returns indicate the free crossing of Lake Michigan by the rainbow trout spawning in the Manistee River, but show little movement for the brook trout. An extension of this work has been made to determine the ^{movements of} trout into and from nursery waters — a matter of special import in relation to the closing of nursery streams. This work has been done under the direction of Dr. Hubbs, since Dr. Metzelaar's death.

8. The dwarfing of fishes, especially perch. A start has been made on this problem, of prime importance in the development ^{ment} of the inland lake fisheries. Samuel N. Jones will carry on this study.

9. Growth and age and size at maturity of game fishes. Much material for these studies has been collected by the several field parties. Related experimental work, on the production of the seasonal marks on the scales, has been done by Dr. Hubbs.

10. Forced growth of fish over winter and increased growth in fish hybrids. Studies of these subjects, of possible importance in increasing the growth of game fishes, have been continued by Dr. Hubbs.

11. Environmental control. Investigative work has been carried on also, on the promising possibilities of environmental control in increasing the fish productivity of our lakes and streams. Most progress was made on the ^{attempt} ~~problem~~ _{or} stated by Dr. Metzelaar, of increasing trout production by resnagging the streams. More than 200 hole-producing barriers were made in the Little Manistee River. These and nearly 300 others, either naturally placed, or put in by Dr. Metzelaar, were carefully studied and tagged with numbered plates for future observation. The effects of the barriers on the stream and on the food and the fish supply is being investigated by Clarence Tarzwell.

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A start has been made on the possible increase of fish production in inland lakes by introducing weeds for protection and food production; of brush for protection, especially of fry, and of gravel, for spawning beds.

12. Creel Census. The Creel Census has been markedly expanded, and the returns for the past as well as the present are being analyzed in detail, so as to obtain a better measure of the increase or depletion of the game fish supply, both generally and locally.

Other lines of work of the Institute for Fisheries Research include: (1) A study of bait minnows, in relation to their depletion, and to the ~~the~~ possible effects ^{of} the use of carp minnows. (2) Cooperation in the clam investigations. (3) General educational work on fish and fishing subjects. (4) Cooperation in determining and listing lake and stream names, and in correcting maps as to lake outlines, etc. (5) Investigation of the problems of size limits for game fish. (6) Determination of parasites in market fish, for the Board of Health, and parasites in game fish, for the general public.

By these many lines of investigations carried on by The Institute for Fisheries Research, it is expected that the game fish supply of the waters of Michigan can be greatly increased.