Original: Fish Division
cc: Education-Game
Mr. Rodeheffer
Mr. Walter Crowe

INSTITUTE FOR FISHERIES RESEARCH
DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

ALBERT S. HAZZARD, PH.D.
DIRECTOR

ADDRESS
UNIVERSITY MUSEUMS ANNEX
ANN ARBOR, MICHIGAN

June 19, 1940

REPORT NO. 670

REPORT OF EXPERIMENTAL SPAWNING BED CONSTRUCTION IN DOUGLAS LAKE, CHEBOYGAN COUNTY, MICHIGAN SUMMER, 1940

by

I. A. Rodeheffer

During the month of August, 1940, six distinct types of experimental spawning beds for smallmouthed bass were placed in Douglas Lake, Cheboygan County, Michigan. These were made according to directions given in "The Improvement of Lakes for Fishing; A Method of Fish Management," 1938", by Dr. Carl L. Hubbs and R. W. Eschmeyer, pages 98 to 103.

Description of the Area: The spawning beds were placed on the shoal of Douglas Lake, between the University of Michigan Biological Station boathouse and Grapevine Point. The bottom in this area generally is shifting sand, although in some places there is gravel mixed with the sand.

Along sections of the shore at the waters edge there are rocks from one to five inches in diameter. These larger rocks are not found in the water beyond the shore line. This is a somewhat protected area and some drift wood collects on the shoal from other parts of the lake. Occasionally if the wind is from the northeast when the ice break-up occurs, this shore is subject to some ice push, but generally there is less of this here than on other suitable parts of the lake.

Marking of Areas: The areas were marked with the tops of gallon pails which were painted white. On the white surface the letter A with the numbers from 1 to 6 were painted in black. These markers were nailed to trees on shore designating the southern and northern extremity of each spawning area. Thus the first area is marked by A-1 at the south end and by A-1 at the north end of this spawning area. The second type is marked with A-2 at the southern and northern ends. Similarly the third kind of spawning beds are marked by A-3 at both extremities, etc., for the other areas. Approximately 100 feet of shore lies between each area.

Description and Purpose of Types of Spawning Beds: Area A-1 lies about 300 feet north of the Biological Station boathouse channel. This area is made up of 50 piles of screened gravel. The gravel was twice screened, first through a 2 inch diameter screen to remove all stones larger than 2 inches in diameter, and then through a 1/3 inch screen to remove the sand. This resulted in clean gravel 1/3 to 2 inches in diameter. Two cubic feet (measured) of this gravel were placed in a pile. The piles were placed 10 feet apart on the contour line from center to center of piles. Ten piles were placed on the 1 foot contour, 10 piles on the 2 foot contour, 10 piles on the 4 foot contour, 10 piles on the 6 foot contour and 10 piles on the 8 foot contour. The purpose of these 50 piles of gravel is to discover if possible, at what depth smallmouth bass prefer to spawn if they have a choice. This information will be helpful in planning future spawning bed improvements in other lakes. Spawning piles were not put in deeper than 8 feet because it was impossible to see the bottom beyond this depth.

Area A-2 lies 100 feet north of A-1. Here 10 piles of bank run gravel were alternated with 10 piles of screened gravel (1/3 to 2 inches

in diameter). Each bed contained 2 cubic feet (measured) of gravel. All piles were placed at a depth of 2 feet and 10 feet apart. The purpose is to find out if possible if smallmouthed Bass show any preference for screened or bank run gravel. If possible, efforts should also be made to determine what percentage of eggs will hatch in each type of spawning bed.

Area A-3 is located 100 feet north of A-2. The materials here consist of 10 piles of crushed limestone 1/4 to 3/4 inches in diameter alternated with 10 piles of screened gravel 1/3 to 3/4 inches in diameter. All piles consisted of 2 cubic feet (measured) of gravel or crushed stone. They were placed 10 feet apart at a depth of 2 feet.

This procedure is an attempt to discover if smallmouthed bass will use crushed limestone as readily as gravel for spawning purposes. If crushed limestone should prove satisfactory, it may prove particularly valuable in lakes that are slightly acid.

Area A-4 is about 100 feet north of A-3, and consists of 20 piles of screened gravel (1/3 to 2 inch diameter), 2 cubic feet to a pile (measured) placed at a 2 foot depth, 10 feet apart. Ten brush mats about 4 feet square were woven of green soft maple and placed under 10 of the beds of gravel alternating these with the 10 beds of gravel placed directly on the sand.

The object of this experiment is to see if smallmouthed bass will show any preference for one or the other. Brush mats may be an effective and inexpensive means of putting spawning beds in bog lakes.

Area A-5, located approximately 100 feet north of A-4, is made up of 10 piles of screened gravel (1/3 to 2 inch diameter) and 10 beds of stone 2 to 4 inches in diameter. The stones have rounded edges due to wave action. All beds contain 2 cubic feet, are placed at a 2 foot depth and 10 feet apart. Stones and gravel are alternated.

It will be interesting to note if bass will use different sized stone or gravel when spawning. The proper size of gravel to be used in constructing spawning beds has been the subject of much controversy.

Area A-6, the farthest north of the designated spawning areas lies about 100 feet north of area A-5. This section consists of 15 spawning beds made of 4.5 cubic foot piles of gravel (1/3 to 2 inches diameter), placed at a 2 foot depth, 10 feet apart. Ten wooden boxes 3 x 3 x $\frac{1}{2}$ feet were constructed out of old lumber. Five of these boxes had protecting shields* put on two sides 18 inches high from the bottom of the box to form a high corner. The 15 beds were alternated, gravel pile, box, and box with back. The boxes with the high backs were placed with the high corner pointing to the shore. Each box was filled with 4.5 cubic feet of gravel. The piles of gravel were also 4.5 cubic feet. Time did not permit the installation of 10 of each kind here.

Wooden boxes will prove useful in lakes with a soft bottom. If shields prove of value, they are easily added to the boxes.

Future Observations: Observations should be made during the spawning season to see if bass or other species of fish will use these spawning devices.

If possible, eggs should be collected on some nests of each kind to find out how many good eggs are deposited in a nest. Collection of the actual yield of fry from nests of different materials and kinds should give valuable information regarding the effectiveness of these spawning devices.

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*Shields have been used by bass culturists for some time and are believed desirable in bass rearing ponds.

Acknowledgements: This work was under the direction of Dr. A. S. Hazzard, Director of the Institute for Fisheries Research. Dr. Carl L. Hubbs helped to plan the work so far accomplished. The work was made possible by the splendid cooperation of Dr. A. H. Stockard, Director of the University of Michigan Biological Station, in furnishing boats, trucks and other equipment.

INSTITUTE FOR FISHERIES RESEARCH

By I. A. Rodeheffer

Report approved by: A. S. Hazzard

Report typed by : M. Hoffman