

Original: Fish Division
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Education-Game

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DIVISION OF FISHERIES
MICHIGAN DEPARTMENT OF CONSERVATION
COOPERATING WITH THE
UNIVERSITY OF MICHIGAN

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June 19, 1941

REPORT NO. 669

REPORT OF EXPERIMENTAL BRUSH SHELTER CONSTRUCTION

AT DOUGLAS LAKE, CHEBOYGAN COUNTY, MICHIGAN

SUMMER, 1940

by

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During the month of August, 1940, twelve hollow, square brush shelters were constructed and placed in Douglas Lake, Cheboygan County, Michigan. These devices were permanently placed to be observed during the following summer to discover how successful such shelters are in aiding to establish vegetation in parts of a lake where none existed before.

Construction: The twelve hollow square shelters were constructed as suggested in "The Improvement of Lakes for Fishing; A Method of Fish Management" by Dr. Carl L. Hubbs and R. W. Eschmeyer, pages 80 - 82, illustrated in figures 1 and 20.

These shelters were made with a twelve foot square opening in the center. The frames were made of poplar trees about 35 feet long and some five inches in diameter at the butt, so placed that the top of one tree was crossed by the butt of another. This allowed the top of a tree to protrude from each corner of the shelters. Two smaller poplars were used as braces across opposite corners. The frames were

spiked and then wired together with number 9 wire. Bundles of brush about a foot in diameter at the butt end and ten to twelve feet long, made up of poplar, maple, cherry, linden, ironwood, birch and beech were wired to the frame with the butt ends toward the center of the shelter. Placing the bunches of brush as close together as possible, six clumps were wired to each side. To prevent the tips of the brush from floating to the surface, a light poplar pole was laid over the top of the brush about two feet beyond the frame and fastened to the protruding ends of the frame. These poles tended to stabilize the brush and held it in a horizontal plane. A burlap bag, filled with sand was placed on each corner of a shelter to hold it on the bottom of the lake until it should become waterlogged.

Location of Shelters: The shelters were placed in Douglas Lake in areas where there was no aquatic vegetation and where the water deepens very gradually. An attempt was also made to place them in exposed parts of the lake. Eight of the constructions were placed in the shoal area along the south shore of Bryants Bay, just west of Grapevine Point. Four of the shelters were placed in five to six feet of water and four in 10 to 11 feet of water measured from the water level found in late August. The centers of the shelters were approximately 150 feet apart on each contour. The bottom in this region at the 5 to 6 and 10 to 11 foot depths consists almost entirely of clay and is devoid of vegetation. The other four shelters were placed on the big shoal in 6.5 to 7.5 feet of water. This part of the lake is exposed to winds from all directions. The bottom here is sandy.

Marking of Shelters: A piece of sheet metal 7 x 14 inches which had been painted white, with large black Roman numerals painted on the white surface,

was nailed to one of the cross bars as a marker on each shelter. This number may be read from a boat. To further aid in locating the installations, stakes were driven on the south shore of Bryants Bay directly south of each shelter. Each stake carries the corresponding Roman numeral of the shelter. Shelters I to IV were located in 10 to 11 feet of water in Bryants Bay running east to west. Numbers V to VIII were installed towards shore in 5 to 6 feet of water with number V between shelters III and IV, and running from east to west. Stakes were driven near the tip of Grapevine Point to indicate the location of the hollow squares on the Big Shoal. Here these devices lie in an approximate straight line 30 degrees north of east from the stakes on shore. The distance between these structures is approximately 150 feet, measured from center to center.

Treatment of Brush Shelters: One half of the shelters, or two at each depth, were installed and left for later observation to see if silt would gather in the protected central areas of the shelters and if vegetation would start here. In the core of each of the other six constructions, $3/4$ cubic yard of black dirt was emptied from boats into the center of each shelter. Shelters II and IV and V and VII in Bryants Bay, and numbers IX and XI on the Big Shoal had black dirt added in a similar manner. However, in these aquatic vegetation found growing elsewhere in the lake at the depth of the installations was planted. In shelters II and IV at the 10 to 11 foot depth 60 plants of wild celery (Vallisneria spiralis) were planted. In each of the 5 foot shelters numbered V and VII, 32 plants of Potamogeton natans, 28 plants of Potamogeton praelongus and 8 plants of Potamogeton Richardsonii were planted. In shelters IX and XI on the Big Shoal 20 plants of Potamogeton praelongus and 40 plants of wild celery (Vallisneria spiralis) were placed in each shelter.

All plants were taken by digging them from the bottom with long-handled garden rakes. Only plants with roots attached were used. The roots of four plants were placed in clumps of black dirt. The clumps were then tied with string to hold the roots intact. The clumps were dropped from a boat into the center of each shelter.

Acknowledgements: This work was planned under the direction of Dr. A. S. Hazzard. A crew of laborers was supplied by the Conservation Department through District Supervisor of Fisheries Operations, James T. Wilkinson. Valuable help was received from Dr. Carl L. Hubbs. The project was made possible by the splendid cooperation of Dr. A. H. Stockard, Director of the Biological Station. Professor W. F. Ramsdell's willing help with his truck and forestry boys made it possible to get the brush to the lake.

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