

By Professor Reighard's ingenious starch method the kinds represented by the adhesive pickerel's (or dore's) egg can be successfully handled and a larger percentage incubated than by any other method; but such eggs as those of the black bass are specially difficult to treat by any of these methods. The female bass even when in a ripe condition is able to retain her eggs by strong muscular effort, so that they do not flow freely when the hand of the fish culturist is gently pressed along the underside of the body. In many fishes it is impossible for the female to retain the eggs, when they are fully ripe, especially if pressure be applied; but in the case of the female black bass the case is entirely different. The male, too, presents a similar difficulty, and whereas a male salmon, or trout or whitefish, when ripe, is easily handled, and a supply of sperms or milt readily obtained, the male black bass is very obstinate in this respect.

Indeed some authorities state that the only reliable method is to secure the parent fish of both sexes, at the spawning time, and after killing them to remove the ripe eggs and milt from each. It is often found that specimens of male and female bass when obtained are not ripe at the same time, and disturbing them often prevents the process of spawning, so that the ripe reproductive elements are not discharged. No doubt great losses occur in some waters, especially in shallow creeks, which become partially or wholly dry in the months of June and July and later. These are precisely the months which are the most important in regard to the supply of black bass, for the eggs are then undergoing incubation and the fry are hatching out.

A plan was adopted some years ago by the State of Wisconsin for saving these imperilled ova and young fish, and in the report of the Fish Commissioners for the year 1893-4, they give the following details of the steps which they took:—

"The commissioners became satisfied in the summer of 1893 that great benefit would result to the state by the saving of the bass fry in the sloughs of the Mississippi River. That river overflows its banks in times of floods, forming shallow lakes and sloughs along the banks and on the islands. Into this shallow water the bass go to deposit their eggs. On the subsidence of the waters the parent fish return to the channel waters. The eggs hatch by the millions and the young fish are left to perish, either by the sloughs drying up in summer or freezing in winter. Mr. Nevin made careful examination, and after correspondence with Hon. Marshall McDonald, the United States commissioner, the work of rescuing these young fish, depositing the common varieties in the nearest channel waters and saving the bass and pike for distribution to other portions of the state, was begun in the month of September, 1893. The work was new to Mr. Nevin and his assistants when commenced, and experiments in methods were necessary. But it is believed that excellent results will follow this work. Superintendent Nevin, in his report, says: "I regard the rescuing and distribution of fish from these low places along the river, where they would otherwise inevitably perish, as one of the most economical and practical methods of re-stocking our inland lakes. All the fish so planted are adapted to any of the waters of the state; and the cost of taking and planting them is very small compared with the cost of the artificial propagation of the same species, since we now have a fish car for transporting the live fish." Hon. Marshall McDonald, the United States commissioner of fisheries, writes that "in no other way can so valuable results be accomplished from so small an expenditure."

The removal of adult black bass requires special care at the breeding time, as it may happen that the fish have already prepared their nests and placed their eggs therein, or even hatched their young. These young fry if left without parental protection, as a rule, fall a prey to predacious enemies. The Vermont commissioners, in their Fisheries Report for 1888, quote the experience of Mr. C. F. Holt with a batch of these forsaken black bass, who says: "When I went out in the morning the mother fish was gone. I thought I would secure the young fish (they were just hatched), and take them to the house and 'bring them up by hand.' So, putting on my wading boots, I walked out to the bed, and there I found, not the young fry, but three or four crayfish and some minnows, which had evidently devoured every fish on the bed. At another time, under similar circumstances, except that the eggs