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STUDY SHAD PROBLEMS IN SOUTHERN WATERS

Analyses of experimental catches of shad eggs and larvae to determine their significant relations to spawning and escapement problems are now being undertaken in southern waters, the Fish and Wildlife Service today reported to Secretary of the Interior Harold L. Ickes.

Scale markings on shad heretofore have proved to be a reliable tool for measuring the spawning escapement of shad in the Hudson River, N. Y. They appear to be unreliable in southern waters, however, and other methods must be employed here, it is pointed out in Service field reports.

Data for this purpose have been obtained from collections of shad eggs and larvae taken from the Hudson River last spring by the Fish and Wildlife Service working in cooperation with the State of New York Conservation Department. In the Hudson River, where the fishery has been increased enormously in recent years, scale studies have shown the spawning escapement to be 40 to 50 percent of the annual run of shad. This escapement appears to be adequate to maintain the fishery at its present level of abundance.

"If, then, for the sake of comparison, the escapement of 50 percent of the annual run is considered 100 percent adequate, we may compare catches of shad eggs and larvae on the same basis. This is now being done in the case of the Edisto River, in South Carolina, for which data are at hand.

"The total seasonal catch of eggs per unit of gear in the Edisto amounts to about 1/20 of that in the Hudson River. The spawning escapement in the Edisto River, therefore, being but 1/20 of 50 percent, or 2.5 percent of the annual run, is wholly inadequate to maintain the fishery. The catch of larvae in the Edisto bears the same ratio to the catch in the Hudson as does the catch of eggs--i.e., 1:20. In addition, the maximum monthly catch and the maximum weekly catch of both eggs and larvae in the Edisto and Hudson rivers show this same relationship to each other," the report continues.

"The method outlined above for calculating the spawning escapement of shad can be extended to a number of other shad rivers."

During May and early June of this year, a preliminary survey of the spawning grounds of the shad in the Hudson River was undertaken by the Service cooperating with the State of New York Conservation Department. It was the purpose of the survey to learn everything possible concerning the extent of the spawning areas, the duration of spawning, the rate of survival of the eggs and larvae, also, their development and distribution throughout the spawning range.

In a report on this survey it is stated that spawning of shad in the Hudson occurs in a section of the river from the Mid-Hudson highway bridge to Shad Island, but that the principal spawning is between Kingston and a point just north of Catskill. The greatest concentration of eggs was found in the vicinity of North Germantown. The spawning area is well above the main commercial fishery. But, since the shad must pass the commercial fishery to reach their spawning grounds, it is imperative that the fishery be so regulated as to allow large numbers of fish to pass up the river to spawn. Many spawners are required because the survival rate of the eggs is extremely low.

"Shad eggs that had reached the hatching stage," according to that report, "were found to comprise 0.8 of one percent of the total catch of eggs for the river as a whole. Evidently there is a high rate of mortality when the eggs are passing through the various stages of development for nearly 33 percent of the eggs were alive when taken, yet, only 13 percent of the live eggs had reached the blastula, gastrula, and primitive streak stages of development, and 2 percent of the live eggs, or 0.8 percent of the total catch contained embryos ready to hatch."

Approximately 66 percent of the eggs were dead when taken. A high percentage of the dead eggs seem never to have been fertilized as there is no evidence that development had started before the eggs perished. Some of them had not expanded fully on contact with water at spawning, and may have been immature eggs.

The spawning season in the Hudson River extended from about the middle of May until about the middle of June this year. However, the weather was cold later than usual this spring and the beginning of spawning may have been, for this reason, somewhat delayed as shad do not begin to spawn until the temperature of the water has reached at least 53° F.

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