

interior, on account of the difficulty in transporting them in good condition to distant points, and because the Western markets are at the time glutted with cheaper fish from the Great Lakes. It would seem desirable to have some good fish, like the red snapper or striped bass, in such abundance during the winter months that the people of the South and West could depend upon a reasonably constant supply. The rapid exhaustion of the old red-snapper grounds leads me to believe that these fish are not holding their own against the inroads of man, and their habits and life history show that they cannot do so.

Aside from the work of ascertaining the best way to propagate Gulf fish, and of introducing new species there, the information so gained would be of value to the South Atlantic coast. The striped bass occurs in the Northern Gulf waters, but not abundantly. It is always in fine condition when captured, and is highly esteemed as food. Spawning adults and the young fish are occasionally taken. Besides trying to discover the best way to hatch the common native fishes and others, it would be well also to try to determine the results of the stocking with shad and salmon of the Southern rivers that empty into the Gulf. Probably an intelligent use of gill-nets at the mouths of these rivers at the proper season would be of value in that direction.

Any work of propagation done on the coast of Texas, or reliable information concerning the improvement of the fish supply of that State, would be heartily appreciated by a people who at present are in great need of good food-fish. While engaged in work of a practical nature, there would be opportunity for making large collections of specimens, and many things could be preserved that would be of scientific value to the National Museum, while a thorough study of the marine invertebrates would be of special value and interest, since so little has been done in that direction in these waters. The force at work would be qualified to make such collections. A small beam-trawl could be worked with good results, in the same manner as from the English sailing trawler; and if it was found advisable to have some hatching apparatus on board, there would be ample room for placing a small engine and hatching-jars.

PENSACOLA, FLA., April 20, 1885.

85.—PROPAGATION OF SALMON IN SALMON RIVER, OSWEGO COUNTY, NEW YORK.

By JOHN D. COLLINS.

I have been greatly interested in the spawning efforts of the *Salmo salar* in Salmon River for several years, and have wondered that the subject has not long ago attracted more attention. The following details are not upon personal knowledge, but were related to me by Mr. Cross, of Pulaski, N. Y., now deceased, who in his lifetime owned the

mill and dam there. The dam is 9 feet in height. My last conversation with him was about three years ago. I believe the information perfectly reliable.

Salmon River was long ago the spawning ground of salmon, up to the time this dam was built. The spearing of salmon was an important occupation of the residents all the way from near the mouth up as far as the High Falls (about 7 miles below the village of Redfield), a distance of some 25 or 30 miles by course of the river. This fall is a perpendicular drop of some 100 to 120 feet, and under it is a deep pool in the rocks of 200 or more feet in diameter. The stream is more or less rapid, varied with flat current; is crossed by the Rome, Watertown, and Ogdensburg Railroad at Sandy Bank, and probably at Pulaski. I think there is also a dam at Sand Bank. The water of the stream (a rather large one), as far as I have traveled it, is of exceeding clearness and transparency.

Mr. Cross about four or five years ago first informed me of the annual presence of salmon at his dam, and their efforts to get over it during the month of June; that their efforts were very persistent, and that some of the strongest males would even jump so as to go over it; also that annually many were caught in seines below the dam. I suggested to him that he should build a fishway, but it was found that the laws were so defective in respect to nets and seines that it was not expedient. In a later interview he told me it was proposed to cut a spillway or overflow around the dam, and that powder had been purchased for the blasting of rocks; still later that such a channel had been cut, and he thought a few had gone up it. This was about two years ago. Mr. Cross died soon after, and I have no later information.

From these facts it seems that this point is the only water in the State of New York where salmon have ever returned after their spawning places have been once broken up. I have supposed that this was on account of the fineness of the water, which in clearness would seem to resemble that of the Restigouche of Nova Scotia, where they abound. It would seem as if by a little public effort this stream could be reestablished as a spawning ground, especially by proper fishways and absolute protection for a year or two until once fairly established. To this end some special legislation would be required, among which would be the protection of "*black salmon*" at all times, under severe penalties, as in Canada. This salmon is a great protection to the spawning grounds.

The waters also of Fish Creek, in Lewis County, heading near those of Salmon River, were formerly the spawning ground of salmon, particularly at what is known as "Shaler's Hole," in the town of Lewis, but were broken up by many high dams on the streams. This stream empties into Lake Ontario through Oneida Lake. I hear of no attempts of salmon to ascend this stream, although it is possible.

UTICA, N. Y., May 22, 1885.