

121.—DISADVANTAGE OF PLANTING SMALL FISH.

By FRANK N. CLARK.

[From a letter to Prof. S. F. Baird.]

I am not surprised at the negative results attending the planting of fry of various species of fish in Goguae Lake and in several other lakes in Michigan.* Not that these waters cannot be stocked with the varieties with which the attempt has been made, but I believe it can be done only by introducing yearling or adult fish instead of fry. For a long time I have been satisfied that the practice of planting larval fish in strange waters is a mistake, and that the chances of success would be much greater by using fish that had passed this stage. While I must admit that the planting of fry has, in exceptional instances, established a species, I think it has been only where the new waters were identical in every essential particular with the old.

It is all very well to return young fish at a very tender age to the waters whence the embryos were obtained, as the conditions in this case are all in accordance with the requirements of their nature, and they stand an equal chance with the fry from the spawning-beds. But their hold on life is too feeble to survive the changed conditions of food, temperature, &c., incident to strange waters. At partial maturity, however, their vitality is far greater than in infancy, and they are not only able to survive new conditions, but also to seek and appropriate those most congenial and best adapted to their requirements, and full acclimatization for themselves and posterity follows. In short, the adults are capable of adapting themselves to a far wider range of conditions than are the fry, and hence are more likely to survive the exigencies of pioneer life.

I think that the success which has attended the distribution and planting of carp is due very largely to the fact that they have not been

* *Battle Creek, Mich., October 9, 1885.*—W. D. Marks, superintendent of the Michigan fish-hatcheries at Paris, Mecosta County, has been making tests, in the interest of the State, in the lakes in this vicinity, to ascertain the result of fish-culture. One of the first lakes stocked with fish in Michigan was Goguae Lake, a summer resort one mile south of Battle Creek. This lake was planted ten years ago with the fry of the California salmon, landlocked salmon, carp, whitefish, eels, speckled trout, and grayling, and since that time has been repeatedly planted with thousands and thousands of fry. Our citizens and our local sportsmen's club have taken great pains to protect the fish in this lake, even securing a special act of the legislature forever prohibiting the spearing of fish in the lake, and as the law prohibits the catching of fish by nets in all inland lakes of Michigan, fishing by hook and line was the only mode allowed at Goguae. Superintendent Marks set 100 rods of gill-nets several nights, but did not catch a single variety of the fish planted ten years ago and since in the lake. He also tried the experiment in Metcalf's and Hamblin's Lake, and failed to find any signs of the fish. He also made the test in several of the lakes in the western part of the State, with the same result.—CHICAGO INTER-OCEAN.

transferred until they had passed the fry or larval stage. Of course it is not practical to treat whitefish, shad, &c., the same as carp, nor to rear the young in large numbers in ponds, but the adult fish could easily be transferred from native to new waters. In this way I believe that more than half the inland lakes and small waters of the Northern States could be stocked with whitefish, lake trout, or lake herring, or perhaps with all of these and other varieties. Elizabeth Lake, Oakland County, was formerly well stocked with whitefish, resulting from a plant of about 100 adult fish upwards of thirty years ago, which were hauled to the lake in casks from Lake Saint Clair by Mr. A. Whitehead, of Pontiac.*

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122.—PLANTING WHITEFISH AND OTHER SALMONOIDS IN INLAND LAKES.

By MARTIN METCALF.

All the salmonoids, including the brook trout, grayling, &c., breed in sheltered, rapidly-running water of low and even temperature (or the equivalent of these conditions), the eggs being deposited and fertilized near the head springs or at such points as will secure the conditions named and not subject the eggs to freezing, as a slight frosting, or even a sudden change of a few degrees in temperature, is sufficient for their destruction. So, also, exposure to the direct rays of the sun, or in water at rest for but a short time, will destroy the eggs.

Most of this family of fishes spawn in late autumn and early winter, while only a few, such as the grayling, California mountain trout, &c., cast their ova in early spring. The spawn of the last-mentioned varieties will endure a somewhat higher temperature, but is still more susceptible to sudden change and less tenacious of life than the fall spawners.

It will thus be seen that the expectation of the successful natural reproduction of the salmonoids in lakes having no considerable visible inlet or outlet must meet with disappointment. Adult trout may survive for a time along with pickerel and bass, but their successful reproduction and the growth of the fry is impossible, as the perch, pickerel, bass, and other predaceous shallow-water fish would quickly devour the fry. There are whitefish in some of the deep inland lakes of Michigan, and the species has been there beyond memory, but this is because the whitefish is a deep-water fish and thus escapes from his predatory neighbors.

The promiscuous planting of any kinds of fishes in all sorts of waters, in Michigan as well as elsewhere, has been and must always be without

* The Michigan fish commission 7th biennial report, December 1, 1884, to December 1, 1886, p. 76, states that whitefish were about exterminated there in 1881.