

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.\*

NORTHVILLE, MICH., *October 31, 1885.*

## 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.

satisfactory results. Especially is this true of depositing too many kinds together, without reference to the present inhabitants and special conditions of the waters and to the requirements of the new-comers. Many of the early plantings, however, in the waters of Michigan were largely matters of experiment, and need not be repeated.

BATTLE CREEK, MICH., *October 26, 1886.*

**123.—NOTES ON THE NEW ENGLAND FISHERIES IN DECEMBER, 1886.**

**By W. A. WILCOX.**

As usual at this season of the year, most of the fishermen and fishing-vessels are either idle or engaged in other callings. The severe losses in December of 1885 and previous years wisely lead to a partial temporary suspension of the fisheries. During the month there were many severe storms and much rough weather, yet accompanied by comparatively few disasters.

A much reduced fleet from Gloucester has continued in the cod fisheries of George's Bank and the fresh-halibut fishery of the more distant fishing-banks.

A number of sail from Gloucester and other ports have also engaged in supplying the large demand for fresh fish. Vessels have also sailed for the Bay of Fundy and Newfoundland for cargoes of frozen herring.

The receipts of salt cod at Gloucester have been mostly from Western Bank, and the amount varies but little from that of the corresponding month of 1885, which was principally from La Have Bank.

The catch of codfish off Cape Ann and particularly in Ipswich Bay has been light, the fish having been late in striking in or near shore; while the fewer vessels and boats engaged, and much rough weather, all combined, accounts for decreased receipts from the shore catch. The schooner Arthur D. Story, the only vessel sent to the Bay of Islands, Newfoundland, for herring, arrived at Gloucester on December 2 with 800 barrels of fish.

Mackerel of large size and fine quality remained in the vicinity of Cape Cod up to the middle of the month, the vessels engaged in this fishery having all hauled up; and the catch was confined to gill-nets, weirs, and traps, which realized over \$50,000 from the late catch of mackerel.

The remaining weirs and traps along the Massachusetts coast were all taken up during the month. Owing to the abundance of bait on the fishing-grounds, the low prices obtained for it, and the scarcity of more valuable fish, their business has not shown much profit.

Squid continued very plentiful on Western Bank and George's Bank up to December 7. Many vessels left port without any bait, depend-