

immature fish. As the main fishery has shifted to a position farther north, there should be no great obstacle to the application of adequate measures to the older banks.

In addition to propositions discussed privately, there has been a strong effort to pass a measure designed to meet the urgent need for the protection of the banks. This has resulted in the introduction into the Congress of the United States, and its passage by the Senate, but not by the House, of a Bill (S. 4586), establishing a close season for halibut during the months of December and January, and a nursery of approximately 200 square miles near Hecate and Noyes Islands, Alaska. The enforcement of this was to be dependent on the enactment of similar regulations by the Canadian Government. It was the present author's opinion, as expressed in a previous communication to the Provincial Fisheries Department, that the remedy for the depleted condition of the banks "would be to materially restrict the fishery (1) by stopping fishing entirely over large areas, such as Hecate Strait; (2) by making a close season of, at the very least, twice the length suggested; or (3) by limiting the number of boats and men employed."

The provisions of the Bill and the above alternatives are here discussed in greater detail, with the exception of the question of limiting the "number of boats and men employed," which cannot be seriously considered in view of the necessarily international aspect of the proposed remedies. Brief comment on an additional means of combating depletion—namely, artificial propagation—is also given.

ARTIFICIAL PROPAGATION.

The contemplation of experiments in hatching the halibut must lead simply to ill-founded optimism on the part of the fishermen. The hatching of cod and plaice has been carried on by several Governments with results which are local and limited, and have been disputed. These species are much smaller, more easily handled, come to maturity at a smaller size, and the near-ripe fish are obtainable in greater numbers than is the case with the halibut. The latter's ova are shed gradually, so that to get quantities of ripe ova it would be necessary to keep fish in breeding enclosures, and, as they reach maturity at a considerable size, this would be difficult and expensive. It is also very doubtful whether, on the long sea voyages of the fishing-boats, enough ripe spawn could be captured to make the attempt profitable. As the number of eggs produced by a female during its lifetime is supposed to be proportional to the difficulties encountered in survival after being laid, the value of such ripe eggs as are obtained from this species would be less than that of those from less "prolific" forms. The number of ova laid in each of the spawning periods of a halibut is about 300,000 when 35 inches long, and 1,000,000 when 50 inches, and there must be about ten such periods in the normal life of a twenty-year-old fish. So the value of hatched eggs cannot be great unless the resultant young are carried through more of the precarious stages than is usual, or possible without great expense. Hence, in the face of the wholesale reduction in numbers of halibut on the banks, the establishment of hatcheries cannot be regarded as anything but exceedingly expensive experimental work. Its results, unlikely as they are to be of value, could not be known for many years, and those years might mean the ruin of the industry if action were delayed pending the arrival at a conclusion.

CLOSE SEASON.

Recognizing the urgency of the situation, there has been, among fishermen and dealers, a strong sentiment in favour of the imposition of a close season of two months, December and January. This has been perhaps the most widely approved measure of any proposed, and in view of the widespread adoption of closed seasons in conserving other species is worthy of careful consideration.

To be worthy of adoption, however, it is imperative that a measure be shown capable of conserving the numbers of the species as a whole or in threatened areas, or adequate to increase the number of spawning fish where it has fallen below the margin of safety. The question in any case is simply one of ensuring the existence of a sufficient number of breeding males and females in those large areas now lacking them.

It is a serious question whether the closed season would not simply result in a more intense fishery during the open portions of the year. It must be remembered that the cold-storage facilities now available render it possible to deliver a supply of halibut all the year round, with or without a close season. There is no question, then, of an interruption of the demand from