

ANNUAL MEETING - JUNE 1954UNITED STATES RESEARCH IN CONVENTION AREA DURING 1953.

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SUBAREA 5HADDOCK:

Georges Bank Population in 1953. The 1950 year class which dominated the fishery in 1952 as two-year-olds, causing a preponderance of scrod over large haddock, continued its dominance throughout 1953. The preceding dominant year class (1948) contributed about 17 percent of the catch. In spite of this, the quantity of scrod landed was still slightly more than the quantity of large haddock. This was the fourth consecutive year in which scrod exceeded large.

Total haddock landings from Georges Bank during 1953 were 71 million pounds, which is 11 million pounds less than the quantity taken during the preceding year. Part of this drop is attributed to a decrease in effort of 12 percent. The quantity landed was within 4 percent of the figure predicted last year.

For the coming year the predicted catch is 74 million pounds if the amount of fishing is the same as in 1953. The 1952 year class promises to be a strong one. If it does not come up to expectations there will be a serious decline in the Georges Bank fishery in 1954.

Effects of Mesh Regulation. The 4½ inch mesh was legally adopted June 1, 1953, but complete conversion was not effected until October 1. Eight vessels were licensed during that period to fish with the old small mesh gear in order to assess the effects of the regulation. A comparison of size distribution of samples taken regularly by observers at sea on both large and small mesh vessels demonstrated that the two sizes of nets were selecting haddock precisely as had been predicted by our experimental studies.

The anticipated initial decrease in landings occasioned by the loss of some small marketable fish the first year, however, was more than compensated for by an increase in the efficiency of the large mesh in the capture of larger fish. The net result during that period was an advantage to the regulated vessels of about 10 percent (See Annual Meeting 1954, Document No. 15, App. I).

Effects of Exemptions. A study was made of the effects exempting part of the fleet would have on the benefits of the mesh regulation for haddock fishing on Georges Bank. A report of these studies is contained in Ann. Meet. 1954, Doc. 15, with App. II.

Certification of Nets. In order to arrive at the measurement of new nets which could be certified for haddock fishing in Subarea 5 it was necessary to study the shrinkage and stretching of cod ends with use. A series of nets were measured before use and after varying amounts of use in regular fishing operations. The U.S. Government decided to certify new cod ends constructed of 45 yard doubled twine measuring 5-½ inches between knot centers since this size stabilized at about 4-½ inches inside dimension at the half life of the average cod end.

Food Habits. The first year of haddock stomach collections has been completed. Information obtained so far suggests there are three food-type areas on eastern Georges Bank as follows:

- (1) Southeast Part - characterized by:

Echinarachnius (sand dollar)  
Byblis (amphipod)  
Leptocuma (cumacean)

- (2) Northeast Peak - characterized by:

Ophiopholis (brittlestar)  
Hyas (toad crab)  
Marphysa (annelid)

- (3) Northern Edge - characterized by:

Ethemisto (amphipod)  
Meganyctiphanes (euphausiid)  
Cuspidaria (pelecypod)

Seasonal and annual fluctuations in the bottom fauna may have great importance in the abundance and migration of ground-fish. A continuance of food habits studies for a period of five years should decide this question.

Drift of Eggs and Larvae. Four cruises of the Albatross III were devoted to the study of the fate of haddock eggs spawned on Georges Bank. Hardy plankton recorders were used as collecting instruments. Results indicate that the 1953 spawn drifted westward as anticipated, but got caught up in the Gulf Stream before assuming the demersal habit so that most were lost to the fishery. Almost no young of the year were found on the bottom on Georges Bank during the fall cruise. Drift bottle returns corroborate the conclusion that the 1953 spawn was mostly lost. A test of this hypothesis will come next year when the 1953 year class is due to enter the fishery.

#### REDFISH:

Age and Growth. Periodical sampling of a single population of redfish in the Gulf of Maine throughout the year provided material for demonstrating the growth of the fish and increments on otoliths. The opaque zone at the edge of the otoliths increases progressively during the year and is followed by a clear zone laid down between November and February. The principal growth of the fish corresponds to the growth of the opaque zone. Thus, one ring is formed annually. However, the age at which the first clear zone is formed has yet to be determined. The assigned ages may have to be adjusted by one year when this point has been clarified. Thus, we now feel certain that our original concept of the redfish as a very slowly growing fish is correct.

Abundance. With the problem of the growth rate of the redfish largely settled and a method of aging at hand it is now possible to investigate mortality rates and other aspects of the biology of the species with a view toward assessing the effect of fishing on the productivity of stocks. Age analysis of samples of the commercial catch will be intensified and work will be concentrated on catches from selected areas.

The overall abundance of redfish in the Gulf of Maine as shown by catch per day's fishing appears to have stabilized but the catch per day on the very productive grounds on the Grand Banks showed a decrease of 15 percent in 1953.

#### SUBAREAS OTHER THAN 5

Haddock of Subarea 4. United States vessels increased their fishing effort on Nova Scotian Banks in 1953. In 1953, 34 percent of the catch came from Subarea 4 while in 1952 only 29 percent came from that area. This trend continued in the early part of 1954. U.S. biologists have been sampling catches from Nova Scotian Banks since 1930. In this report year an analysis of the collected data was started. Attention for the present is being concentrated on the stock on Sable Island Bank, since records from this area are more complete. These studies are designed to shed light on the amount of fishing which should be applied to this stock in order to produce the optimum yield.

Observers on commercial vessels made nine trips to Subarea 4 sampling fish retained and fish discarded on vessels with regulation nets as well as on vessels licensed to fish with small mesh nets.

Haddock: Egg and Larva Drift. The results of the Albatross III plankton studies emphasize the importance of the drift of eggs and larvae in the biology of groundfish. Although there may be little intermingling of adult populations of haddock on Georges Bank in Subarea 5 with those on Browns Bank in Subarea 4, there is the possibility that Georges Bank populations are derived at least in part from eggs spawned on Browns Bank.

Future plankton surveys will be designed to follow the drift of Browns Bank eggs and larvae as well as those spawned on Georges Bank.

Cod. Sampling of the commercial catch of cod principally from Browns Bank for length frequencies was started this year. These records will be useful to Canadian biologists doing intensive work on Nova Scotian stocks.

Redfish. Market samples are taken from all vessels landing in U.S. ports. Since a large proportion of U.S. landings of redfish come from Subarea 3 and 4, a good sample of redfish from these areas was obtained. These redfish were used for the abundance studies mentioned above.

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