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United States Research in the Convention Area During 1958

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SUBAREA 5

Haddock (Melanogrammus aeglefinus (L.))

The Fishery. U.S. haddock landings were lower than in 1957. The Boston landings for 1958 were approximately 12 percent less than landings for 1957, with only about 1 percent difference in effort. A trend toward higher proportions of larger fish over the past few years continued in 1958, which was the first year since 1949 that more large than scrod haddock was landed. The total haddock catch-per-trip was 5,000 pounds less in 1958 than in 1957.

Preliminary analysis of Georges Bank age composition in 1958 shows the 1954 year-class continued to dominate the fishery. The 1952 year-class is no longer important in the fishery and the 1956 year-class was weak, thus ending the cycle of alternating large and small year-classes which began in 1947. With weak year-classes in 1955 and 1956, the outlook for the 1959 haddock fishery is poor. A young-of-the-year census cruise aboard Albatross III suggests that the 1958 year-class is of greater than average strength and may contribute substantially to 1960 landings at age two.

Tagging. The haddock tagging program in Subdivisions 4X, 5Y, and 5Z continued in 1958. Tagging was conducted at four widely separated areas in spring and fall cruises. The plastic tube ("spaghetti") tag attached dorsally was used exclusively in the program in which about 2,600 otter-trawl-caught fish were tagged.

Returns analyzed by season tagged show spring tagging most successful, fall and winter tagging only moderately successful and summer tagging least successful.

Ecology. A program to study the relationship of haddock to its environment was conducted in 1958. A small haddock ground off Cape Cod was fished by a chartered commercial otter trawler once each month. Bathythermograph drops were made on each trip and a sample of 50 male and 50 female haddock was returned to the laboratory. This sample was examined for age, growth, weight, and to determine the seasonal changes in gonad development. Stomachs were collected from the 100 fish for analysis of food habit changes throughout the year.

Abundance data indicate that although some haddock are present on the ground throughout the year, they tend to congregate there in the spring for spawning.

Age Determination. Special studies of otoliths, scales, and fin rays designed to refine age readings continue.

Effects of Mesh Regulation. The increase in average weight of landed haddock at ages 2 and 3 which was observed shortly after enactment of mesh regulation in Subarea 5 continues and is now observed in fish 4 and 5 years of age. The persistence of this increase well beyond the 100 percent selection point of the 4½-inch mesh net

may indicate a greater-than-predicted saving of small fish, substantially a reduced fishing effort on early ages.

Growth studies covering the period 1953 to 1958 eliminate the possibility of the increase in weight having resulted from an increase in rate of growth.

Cod (Gadus callarias L.)

The Fishery. A definite increase in abundance of cod in Subarea 5 occurred in 1958 due to successful recruitment of one or more year-classes into the fishery of what are tentatively considered two- and three-year-old fish.

Research. Study of age and growth of cod on Georges Bank and adjacent areas showed that scales are of very limited value for this work but that otoliths are apparently easily read. Rough growth rates calculated from otolith readings agree with earlier Bureau of Fisheries work in that this is a very rapidly growing stock of fish, attaining sizes on the order of 50 centimeters in three years.

Some preliminary exploration of the possibility of identifying subspecific groups of cod by paper chromatography of muscle tissue has been made. This work indicates that degenerative changes in the muscle of fish stored for two or three days on ice are probably not serious.

Examination of data on infestation with the parasite Lernaeocera has been completed and the evidence thus obtained bears out previous theories about distribution of stocks of fish in Subarea 5.

Accumulation of material on a cod bibliography continues and it is expected to have this substantially completed by the autumn of 1959.

Flounder

Extensive age and growth studies of the yellowtail flounder (Limanda ferruginea (Storer)) from three principal New England fishing grounds are completed. Tagging data have been analyzed for all returns through 1958.

The yellowtail flounder appears to be increasing in abundance on southern New England grounds and the southeast part of Georges Bank. Catches in 1958 were the best since 1949. Fish from the 1955 and 1956 year-classes contributed substantially to the landings.

During 1958, monthly samples of the dab (Hippoglossoides platessoides (Fabr.)) were obtained for age-growth and life history studies.

Industrial Fishery

Species composition studies of industrial fish landings were extended and analyzed to determine the role of bottom temperature in the distribution and relative abundance of various species in specific areas.

Industrial fish generally was not as abundant in 1958. The red hake (Urophycis chuss (Walb.)) in particular was in short supply relative to the prior three years.

Silver Hake (Merluccius bilinearis (Mitchill))

Research. Annual summaries presenting biostatistical data are being prepared for the years 1956 through 1958. The summaries will

include landing statistics for all major New England ports, the percentage utilization of landings (food, reduction, etc.) and the age-length composition of these landings.

A study of the feeding habits of the silver hake indicates that invertebrates, especially euphausiids and decapod shrimp, are the principal food in the New England area.

The Fishery. Landings of silver hake were generally off compared with 1957. The decrease appeared to be associated more with the colder water conditions inshore than with a decrease in absolute abundance.

Redfish (Sebastes marinus (L.))

The Fishery. Abundance in the Gulf of Maine held steady, as did landings.

Research. Biological data were collected regularly from the commercial catch. These data include length, age, abundance, size at maturity, time of spawning, and incidence of parasites.

Racial studies were intensified in preparation for the Redfish Symposium to be held in October. For these studies collections were received from many areas in the North Atlantic.

The vertical distribution of larval and postlarval redfish was described for the Gulf of Maine.

Certain phases of the growth and migration studies of the Eastport stock were completed and will be reported at the symposium.

Sea Scallops (Placopecten magellanicus Gmelin)

The Fishery. U.S. landings from Subarea 5 in 1958 were 14.4 million pounds, compared to 17.3 million pounds in 1957. The decrease was entirely due to a decrease in effort from 10,500 days fished in 1957 to 8770 days in 1958.

Research. Two cruises were made to collect data to be used in estimating growth and mortality rates and to conduct tagging experiments. Routine collection of catch, effort, and size composition data continued at all ports of landings. Catch and effort statistics tabulated by 10-minute squares were forwarded monthly to Commission headquarters at Halifax. Results of analyses of data are reported elsewhere in Commission documents.

Plankton Ecology

A study of the vertical distribution of larval and juvenile haddock in the Gulf of Maine-Georges Bank area indicates that young haddock remain in the upper layers for a considerable period. Maximum numbers of prolarval and postlarval haddock (4.5-20.0 mm.) occurred in the upper 20 meters in all areas. Maximum numbers of juvenile haddock (50-90 mm.) were found at the 20-meter level. No diurnal migration pattern was indicated. A study of the vertical distribution of larval and juvenile haddock in relation to the distribution of zooplankton has been initiated.

OTHER SUBAREAS

Most of the United States research was restricted to Subarea 5. Co-operative studies with Canada of Subarea 4 haddock continued. Redfish abundance and racial studies extended to catches from other areas as in past years.