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Status of the Fisheries and Research  
Carried out in Subarea 5 in 1971

by

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Pertinent Documents

Reports on research have been received from Canada, France, Fed. Rep. Germany, Japan, Poland, Spain, USSR, UK and USA. The following documents report matters of interest to Subarea 5.

Res. Docs. 72/1, 5, 6, 7, 8, 9, 13, 20, 22, 23, 24, 27, 28, 29, 33, 36, 37, 39, 41, 42, 43, 44, 45, 46, 51, 52, 55, 57, 62, 63, 89, 92, 94, 97, 101, 103, 112, 113, 115, 116, 117, 118, 119, 120, 123, 124.

The latest information regarding the state of fish stocks and most recent assessments are given in the Report of the Assessments Subcommittee (Redbook 1971, Part I) and in the report of its Mid-Year Meeting (Res.Doc. 72/1).

(1) Status of the Fisheries

Total catches of all species, excluding catches by non-member countries, increased about 18% from 659,000 tons in 1970 to 778,000 tons in 1971. Increased catches were recorded by Canada (47,000 to 61,000 tons); Japan (11,000 to 15,000 tons); Poland (102,000 to 125,000 tons); Spain (8,000 to 9,000 tons); and USSR (166,000 to 293,000 tons); catches by Romania remained the same (2,000 tons in 1970 and 1971); and decreased catches by Fed. Rep. Germany (92,000 to 58,000 tons); and USA (230,000 to 213,000 tons).

Cod catches increased slightly from 33,000 tons in 1970 to 35,000 tons in 1971 due to stable catches by Canada (3,000 tons both years); Spain (7,000 tons both years); and slight increases for USSR (about 1,000 tons in 1971); and USA (22,000 to 23,000 tons).

Haddock catches remained at the limitation level of 12,000 tons set by the Commission, with catches of about 1,700 tons by Canada; 1,300 tons by Spain; 8,500 tons by USA and less than 500 tons by Romania and USSR.

Redfish catches continued to increase (17,000 to 20,000 tons). Most were taken by the USA (16,000 tons) but with catches by the USSR increasing from 0 in 1970 to 3,000 tons in 1971. Increases appear to result from increased effort.

Silver hake catches continued their wide fluctuations and increased from 48,000 tons in 1970 to 95,000 tons in 1971. Catches by the USA declined (19,000 to 13,000 tons) but the USSR catches increased (28,000 to 82,000 tons). The decline for the USA was mainly in the industrial fishery. The increase for the USSR is attributed to increased commercial concentrations and high fishing effort.

Red hake catches increased sharply from 11,000 tons in 1970 to 28,000 tons in 1971, but did not reach the level of 1969 (50,000 tons). USSR catch increased (7,000 to 25,000 tons); USA catch declined (4,000 to 3,000 tons). Increased catches are attributable to increased effort mainly from May through October.

Yellowtail Flounder landings were 23,000 tons but total take including discards was estimated to be about 30,000 tons.

Total reported catch for the regulatory area west of 69° Long. reached 14,300 tons, exceeding somewhat the 13,000 ton limit set by the Commission for that region. Total reported catches for the regulatory area east of 69° Long. at 16,600 tons exceeded slightly the 16,000 ton limit set by the Commission.

Herring catches by member countries increased from 220,000 tons in 1970 to 247,000 tons in 1971. Fed. Rep. Germany catches declined sharply (88,000 to 56,000 tons), while catches increased for Canada (5,000 to 20,000 tons); Poland (11,000 to 69,000 tons); USSR (56,000 to 64,000 tons); USA (3,000 to 34,000 tons mainly from Div. 5Y). Catches by non-member countries declined from 300,000 tons in 1970 to 17,000 tons in 1971. US catches in Div. 5Y were about 75% adults (age 4+ and older) in contrast to the period prior to 1967 when the fishery was almost all juvenile fish. Age composition of herring caught in Div. 5Z fluctuated somewhat with season. The 1966 and 1967 year-classes predominated although the 1968 year-class was important particularly in the early season fishery by both Fed. Rep. Germany and Poland. USSR studies indicate that all year-classes available to the fishery were poor and that no strong year-classes are likely to be recruited in 1972.

Mackerel catches remained high and increased slightly from 102,000 tons in 1970 to 117,000 tons in 1971 and most were taken by Poland (44,000 tons); and USSR (59,000 tons). The large catches are attributed to both abundance and a continuing high effort. Alewife catches declined again from 14,000 tons in 1970 to 9,000 tons in 1971.

Sea scallop catches remained stable in both 1970 and 1971 at 47,000 tons, of which Canada took 33,000 tons and USA 14,000 tons.

(2) Work carried out

- (a) Canada: Population estimates, gear selectivity and mortality rates due to dredges on sea scallop. Analysis of herring larval surveys. Investigations of heavy metal contamination in swordfish as related to size, distribution and food.
- (b) Fed. Rep. Germany: Studies of catch, effort, catch per unit effort, length and age composition of herring catches by commercial vessels. Studies of herring maturity stages. Population dynamics of Georges Bank herring. Studies of herring spawning time, place and some related environmental conditions from the fishery protection vessel Poseidon. Hydrographic studies and herring larval surveys from RV Walther Herwig.
- (c) France: Participation in joint ICNAF study of herring larval distribution with RV Cryos. Hydrographic observations. Studies to distinguish two species of Merluccius.
- (d) Japan: Obtained records of catch effort from commercial vessels. Length composition of butterfish, argentine and squids from commercial catches.
- (e) Poland: Length and age composition of herring and mackerel samples. Distribution and abundance of herring larvae. Fishing studies for herring and mackerel. Hydrographic and plankton studies on Georges Bank in autumn.
- (f) UK: Continuous plankton recorder sampling, 1,258 miles, with analysis of collected data.
- (g) USSR: Length and age composition studies of silver hake, red hake, herring and mackerel. Egg and larval surveys for silver hake, red hake, and herring. Age analysis for silver hake. Spawning stock estimates. Groundfish trawl surveys and abundance indices estimates for main species. Hydrographic and hydrochemical

(h) USA: Length and age composition for catches of haddock, cod, silver hake, yellowtail flounder and herring. Herring larvae, plankton and groundfish bottom trawl surveys. Environmental studies from cruises of Albatross IV, Coast Guard vessels and shore stations. Population studies on haddock, cod, silver hake, red hake, yellowtail flounder and herring. Food studies of groundfish and research on benthic invertebrate communities. Use of a submersible in studying herring spawning and larval survival.

(3) Hydrographic and Plankton studies

USSR standard hydrographic sections show higher subsurface temperatures in 1971 in the East Channel region and the southern Georges Bank area. In the northern Georges Bank region, temperatures were higher only in the near-bottom layer. Hydrographic studies by Poland in October distinguished five types of water masses in Subarea 5. Mean surface temperature at Boothbay Harbour was slightly lower ( $0.2^{\circ}\text{C}$ ) than in 1969, continuing the break in the upward trend begun in 1967. US data from Coast Guard surveys and records from lightships and light stations are being analyzed.

An atlas which will include monthly distribution of common fish eggs and larvae in Continental Shelf waters from Long Island to Nova Scotia is being prepared by the USA. The USA is also developing equipment for shipboard operation in resolution by type and continuous flow sampling of various plankton types.

According to USSR studies, the biomass of zooplankton over Georges Bank as a whole has recently followed a downward trend and this may affect both strength of year-classes for various fish species as well as directly affecting plankton feeding adults.

Polish researches (September to November) showed copepods as the main component of the zooplankton, followed by Euphausiidae.

(4) Cod

Landings in 1971 fell within the 30,000-40,000 tons estimated maximum sustained yield level. The fishery appears to be fully exploited at this time. Estimates of the abundance of commercial stock for 1972-1974, based on USA research vessel sampling of pre-recruit sizes, suggest that, if fishing effort remains constant, the level of commercial stock abundance should remain relatively unchanged.

(5) Haddock

Bi-weekly reports of haddock catches reaching the Commission Secretariat did not reach 80% of the quota and the fishery was not closed. However, final tabulation shows a nominal catch of 215 tons above the quota. The stock of haddock remains low with fish 8 years and older (mainly 1963 and 1962 year-classes) representing about 50% of the catch. Autumn groundfish surveys by the USA and USSR indicate that the 1971 year-class is only slightly better than that of 1970. Recruitment to the fishery through at least 1973 will be low. Studies show haddock spawning on Georges Bank to begin in late February and to be 50% completed by mid-April.

(6) Herring- The dramatic decline in herring catches from the peak landing in 1968 led to special emphasis on assessment of these stocks and a mid-term meeting of the Commission, at which both total and national quotas were recommended to be applicable in 1972. In Div. 5Y the fishery is primarily harvesting adults (4+ and older) whereas prior to 1967 the fishery was mainly for juveniles. Exploitation levels are high and because of poor recruitment the adult stock will decrease. A further decline in adult stock may reduce the probability of getting a good new year class.

In the Georges Bank area Div. 5Z, the 1968 and 1967 year-classes apparently predominated with some variation in proportions according to time. In the early part of the spawning season (September) older fish were important (5, 4 and 3 year old fish) while later in the season the younger fish (3 year olds) became more important. FRG studies indicate that spawning of herring is located in a narrow band of 10° - 13° C water along the northern edge of Georges Bank. USSR studies continue to show a much reduced spawning stock, however, commercial and scouting vessels reported large concentrations of juvenile herring on Georges Bank and adjacent waters in February and March, 1972.

A joint ICNAF herring larval survey was carried out in 1971 with a number of countries participating. The studies included distribution, abundance, sizes, feeding, etc. Biochemical studies were also pursued in an effort to separate stocks and relate larvae to three possible parent populations.

(7) Yellowtail Flounder- Landings per day fished declined on both major fishing grounds (5Ze and 5Zw). Survey cruise data also reflect lower abundance, particularly for 5ZW. Three and four years old fish made up about 65% of the landings. Assessments based on fall survey cruises and 1971 catches suggest that 1972 abundance will be about the same or slightly less than in 1971.

In 1971 the yellowtail fishery in east of 69°-long. was closed by mid-November when 80% of the quota was reached.

(8) Silver Hake- In offshore catches of silver hake (5Z) fish of three to four years of age predominated and fall surveys by the USSR indicated that the silver hake stock was somewhat more abundant than in 1970. Inshore landings and catch per unit effort were again reduced. Research vessel surveys indicate that pre-recruit numbers were more abundant (1971 year class) and suggest that in 1974 when these fish reach commercial age the harvestable stock is likely to increase. Eggs and larvae of silver hake on the main spawning grounds on the southern slope of Georges Bank were found to be much higher than in previous years. Studies show that the food of the larvae is mainly nauplii, copepodites and adult copepods. Race analysis based on a variety of parameters have delineated a number of stocks of silver hake within the subarea 5 and 6 regions.

9. Red Hake- USSR studies indicate that two principal stocks exist, a 5ZE stock and a 5ZW-subarea 6 stock. During winter, the stocks may be relatively discrete, but in summer during extensive inshore migrations the stocks may be intermixed in some areas.

USSR studies indicate a high natural mortality rate for older ages in red hake stocks and the extremely important role of recruitment in determination of the commercial stock of red hake. Good recruitment of the 1971 year class (determined from trawl surveys) is expected in 1973-74.

10. Sea Scallops - Although landings of scallops remained stable this apparently was possible only because of exploitation of young scallops at about 3 years of age. Fishing mortality is high and Canadian researches indicate important incidental mortality resulting from the action of the dredges used in the fishery.

