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Status of fisheries and research carried out in Subarea 3 in 1975

by

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The following Summary and Research Documents contain information relating to the status of the fisheries and research carried out in Subarea 3 in 1975:

Summary Documents: 76/I/1, 76/VI/8, 12, 13, 14, 15, 16, 17, 18, 19, 20, 22 (Report of Assessments Subcommittee), 23, 27, 28, 29, 31, 32, 33, 35, 36, 37, 38;

Research Documents: 76/VI/2, 3, 5, 6, 7, 8, 9, 18, 20, 23, 27, 28, 29, 32, 33, 39, 51, 52, 53, 54, 62, 67, 69, 70, 72, 73, 74, 88, 89, 91, 100, 108, 109, 112.

1. Status of the fisheries

Nominal catches for all countries combined for the main species exploited in Subarea 3 in the years 1970-1975 are given in Table 1, and by country for the two years 1974-1975 in Table 2.

These provisional data show that the total catch of all species combined in Subarea 3 in 1975 was approximately 100,000 tons lower than in 1974. This was due principally to a drop of about 96,000 tons in the cod catch, most of which occurred in the fishery in the northern Div. 3KL (and in Div. 2J) and, to a lesser extent, in the fishery in Div. 3NO. With the exception of Canada, whose cod catch in Div. 3KL increased in 1975, the catch of all of the main country fisheries in the northern Divisions were lower than in 1974, but the decrease was most marked in the Portuguese and Spanish fisheries in which the cod catches dropped by 44% and 31%, respectively, and were much below the allocations for this stock in the

Table 1. Nominal catches of main species caught in Subarea 3 in 1970-1975 ('000 tons).

	1970	1971	1972	1973	1974	1975 ¹
All species	971	954	958	996	936	825
Cod	533	514	524	464	410	314
Redfish	81	102	123	110	116	88
Greenland halibut	26	14	18	15	12	7
American plaice	89	80	71	72	60	54
Witch	22	31	28	33	23	18
Yellowtail flounder	27	38	40	34	25	23
Roundnose grenadier	23	18	21	11	23	16
Herring	135	118	52	17	18	24
Capelin	3	3	53	209	202	220

¹ Provisional figures.

1975 quota regulations. The decrease in catch in Div. 3N0 was mainly due to a 55% decrease in the Spanish catch, from 38,300 tons in 1974 to 16,600 tons in 1975, which was again considerably below the quota allocation for that stock. These decreases in cod catch were due partly to a reduction of fishing effort by the main trawl fleets fishing in the Subarea - part of which was diverted to the northern Divisions of Subarea 2, where the catch increased in 1975 - and partly to reduced catch-per-unit-effort.

The total redfish catch in Subarea 3 in 1975 was 28,000 tons lower than in 1974. This was due to a decrease in the USSR catch, from 85,000 tons in 1974 to 54,000 tons in 1975, which is in conformity with the lower USSR redfish quotas in 1975. The Canadian redfish catch, mostly taken in Subdiv. 3Ps and 3Pn increased by 12,000 tons in 1975. USSR data indicate that, following the recent introduction of midwater trawling, catch rates of deep water redfish (Sebastes mentella) increased in 1975, especially on the offshore grounds in Div. 3K, 3N and 3M.

The catches of the principal flatfish species in the Subarea in 1975 were at the same general level as in 1974, which is in conformity with the limitations

TABLE 2 Nominal Catches of Main Species in Subarea 3 by Country in 1974 and 1975 ('000 Tons)
 (to nearest thousand tons)

SPECIES	YEAR	BUL	CAN	DEN	FRA	FRG	GDR	ICE	JAP	NOR	POL	POR	ROM	SPA	USSR	UK	USA
Cod	1974	+	59	6	12	8	6	-	-	3	9	85	-	110	109	4	-
	1975	-	58	5	9	10	11	-	-	1	7	56	?	69	87	1	-
Redfish	1974	-	10	-	1	6	1	-	1	-	3	4	-	-	85	5	+
	1975	-	22	-	1	1	1	-	+	+	3	6	?	+	54	1	-
Greenland Halibut	1974	-	6	-	+	+	1	-	-	+	2	+	-	-	3	+	-
	1975	-	8	-	+	+	1	-	-	+	5	-	?	-	3	+	-
American Plaice	1974	-	42	-	1	+	+	-	-	-	1	-	-	-	15	1	-
	1975	-	39	-	1	-	+	-	-	-	1	1	?	+	12	+	-
Witch	1974	-	7	-	+	1	+	-	-	-	2	+	-	-	12	+	-
	1975	-	4	-	+	+	+	-	-	-	4	1	?	-	10	-	-
Yellowtail Flounder	1974	-	18	-	+	-	-	-	-	-	-	+	-	-	7	-	-
	1975	-	19	-	+	-	-	-	-	-	-	+	?	-	4	-	-
Roundnose Grenadier	1974	-	-	-	-	+	+	-	-	-	+	-	-	-	23	-	-
	1975	-	-	-	-	-	-	-	-	-	1	-	?	-	14	-	-
Herring	1974	-	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	1975	-	23	-	-	-	-	-	-	-	-	-	?	-	-	-	-
Capelin	1974	-	15	-	-	-	-	-	-	44	7	4	-	4	129	-	-
	1975	-	5	-	-	-	+	16	3	36	5	1	?	4	151	-	-

+ = less than 500 tons

on catch set by the quota regulations for them.

The catch of roundnose grenadier dropped from 23,000 tons in 1974 to 16,000 tons in 1975, due to a substantial decrease in the USSR catch in Div. 3K. This was largely due to a shift in some of the effort on this species to more northerly grounds in Subarea 2, where the catch increased from 5,600 tons in 1974 to 11,800 tons in 1975.

The total capelin catch in the Subarea increased by 18,000 tons in 1975. Of the main country fisheries, the USSR catch increased by 22,000 tons, while those of Canada and Norway decreased by 10,000 tons and 8,000 tons, respectively. The higher USSR catch was due to a substantial increase in the northern part of the Subarea (Div. 3K and the adjacent Div. 2J) and in Div. 30. (The USSR catches in Div. 3L and 3N were lower than in 1974.) All of the reduced Norwegian catch in 1975 was taken in Div. 3N, while Canada took smaller catches in all of the Divisions in which she fished for capelin. Iceland reported, for the first time, a catch of 15,800 tons of capelin, from Div. 3N in the Subarea in 1975.

The increased herring catch in 1975 was due to increased effort in the Canadian fishery, especially in Div. 3K and 3L, but the total catch remained low compared with earlier years (in the years 1968-1971 annual catch exceeded 100,000 tons). The haddock catch also remained very low.

2. Research carried out in Subarea 3

(a) Environmental studies

Hydrographic observations were made in the Subarea in 1975 by Canada, France, FRG, GDR, USSR, UK, and USA. They showed that in the first half of the year temperatures in the surface-200 m depth layer on the Labrador and Newfoundland shelf area were somewhat lower than the long-term average (ice conditions again hampered fishing in the northern Newfoundland coastal waters in 1975), but in the second half of the year they were above average, especially on the southern edge of the Grand Bank where, according to Soviet observations, the influence of the Gulf Stream gave temperatures 3-4.5°C higher than the long-term average. The influence of the

cold Labrador Current was below average in the Flemish Cap area in June, but was considerably above it in the Labrador Shelf area in August.

Plankton Recorder surveys of the plankton in the Subarea were again conducted by the Institute of Marine Environmental Research in the UK (Res. Doc. 76/VI/73). These showed that the phytoplankton concentrations principally of (Thalassiosira spp., Chaetoceros spp. and Thalassiothyx Longissima) were much above average in April, and Thalassiosira spp. was also abundant in October-December. The abundance of copepods was also higher than average in the summer months (July-September), that of the adult stages of Calanus finmarchicus being especially so. The abundance of Euphausiacea, principally Thysanoessa longicaudata, was also much above average, the numbers sampled in 1975 being the highest in any year since the surveys started in 1961. The numbers of fish larvae recorded in the surveys were again very low. USSR plankton investigations in the Grand Bank and Flemish Cap areas in June showed that the centres of highest phytoplankton blooms occurred at the boundaries between the cold and warmer water masses in the hydrographic frontal zones and were associated with the highest concentrations of zooplankton (Calanus finmarchicus and Euphausiacea).

A survey of benthos in Subarea 3 was conducted by USSR in 1975, the depths sampled ranging from 43-850 m. The highest biomass was recorded on the slope of the banks and the lowest in the deep water on the edge of the continental slope. When compared with the results of an earlier survey, the results suggest that the influence of the cold Labrador Current in the Newfoundland shelf area had decreased during the past decade.

(b) Fish stocks

Length and age sampling of the commercial catches of the principal species fished in Subarea 3 was again undertaken by most countries (information on the sampling effort by each country with comments on its adequacy is given in Summ.Doc. 76/VI/33), and this was supplemented by research vessel fishing surveys by a number

of countries (Canada, France, FRG, GDR, Spain, and USSR) to provide additional information on the distribution, abundance, composition and other biological characteristics of the exploited stocks, especially with reference to the pre-recruit age-groups of cod. These data were used in stock assessments and TAC calculations for the main species by the STACRES Assessments Subcommittee, the results of which are given in Summ.Doc. 76/VI/22. An age-reading workshop was held at Vigo, Spain in October-November 1975, at which comparative studies were made of age-reading of cod from otoliths by workers in different countries, with a view to increasing the accuracy and consistency of age determination for the main stocks. The results of these studies are given in Summ.Doc. 76/VI/13.

Cod. The results of the commercial catch sampling and research vessel trawl surveys by the USSR and FRG provided further evidence that the abundance of young cod (1-3-year-olds) in the Div. 2J-3KL stock was low and resulted in a continuation of the decrease in stock abundance reported last year. This was reflected in reduced catches and catches-per-unit-effort in most countries' cod fisheries on this stock, and points to a further decrease in the abundance of this stock in the immediate future. The 1968 year-class (7-year-old) was prominent in both the inshore and offshore components of this fishery. Soviet observations indicated that in other cod stocks in the Subarea the strength of the young year-classes were of average strength, except in Div. 3M where the 1973 year-class was again shown to be a strong one, which should result in an increase in the exploited stock in future years. A Soviet analysis of trawl survey data for cod in Div. 3NO (Res.Doc. 76/VI/108) showed a significant relationship between the numbers of pre-recruit age-groups and subsequent fishery yields.

Redfish. USSR trawl survey data in 1975 gave above average abundance indices for redfish (Sebastes mentella) in all Divisions, except 3L. The indices were

particularly high in Divisions 3NOP and indicate a continuing increase in stock abundance in the southeastern part of the Subarea. Canadian data showed that 8-12 year-old redfish year-classes of moderate strength entered the fishery on the shelf in Division 3P for the first time in 1974 and 1975. Under stable fishing conditions they are likely to give a lower sustained yield than those recruiting in previous years during the past decade. Canadian studies in Subdiv. 3Ps showed large diurnal variations in redfish catches by bottom trawl, the magnitude of which differed between age-groups. Unless allowed for in the survey design, this phenomenon may lead to biased results for redfish from stratified groundfish surveys. Redfish stock delineation studies, using multivariate analyses or morphological characters and observations on nematode worm parasite infestation, were reported to be in progress in Canada.

Haddock. The results of Canadian and USSR trawl surveys showed that the abundance of haddock in Subarea 3 in 1975 was again very low.

Flatfish. Canadian investigations of the flatfish stocks in Subarea 3 showed that stock abundance for the main stocks, witch and yellowtail flounder, has decreased sharply in recent years. The results of these investigations and of new or updated assessments for the flatfish stocks by Canadian and other scientists were presented to and used by the Assessments Subcommittee for estimating TACs for these stocks (see Summ.Doc. 76/VI/22). Canadian comparative studies of the food of yellowtail flounder and American plaice showed that the main components of the diet of yellowtail were Polychaet worms and Amphipods, whereas that of American plaice contained considerable proportions of fish and Echinoderms. Growth studies of witch showed that fish from the northern part of the Subarea grow faster, have a shorter life span and mature at an earlier age than those in the southern part.

Roundnose grenadier. Length and age sampling of roundnose grenadier catches was carried out in 1975 by the USSR, GDR and Poland. Information was also presented in Res.Doc. 76/VI/112 on by-catches taken by USSR trawlers fishing for

roundnose grenadier in the years 1967-1974 in Subarea 2 and Division 3K. This shows that in Division 3K, by-catches were small at all depths between 500-120 m ranging between zero at the greater depths fished (1000-1200 m) to 6% by weight at 700-800 m. Greenland halibut and redfish (Sebastes mentella) were the main by-catch species. Cod formed a very small part of the by-catch (0.2%) in the shallowest depths fished (500-700 m). Results of a virtual population assessment for roundnose grenadier, based on GDR length and age composition data from Subareas 2 and 3 in 1973 and 1974 (Res.Doc. 76/VI/27) gave an estimated catch at the $F_{0.1}$ level of between 32,000-40,000 tons. Information on age-reading techniques used for roundnose grenadier in the GDR was presented in Res.Doc. 76/VI/28.

Capelin. Length and age sampling of commercial or research vessel catches and biological studies of the capelin stocks in Subarea 3 were continued by a number of countries in 1975. A further investigation of the migration of capelin to and from the spawning area and the measurement of spawning stock size in Div. 3N, conducted by Soviet scientists in the summer (Res.Doc. 76/VI/51), showed that the main body of mature capelin moved into the spawning area in early June and spawning took place throughout the period late June-early August, with the peak occurring between 20-25 July. Following spawning the spent fish moved northward and from August to October were observed feeding heavily on planktonic crustacea in Divisions 3K and 3L. The spawning concentrations consisted mainly of 3- and 4-year-olds (1972 and 1971 year-classes). The stock size in this area was estimated, using a combination of acoustic, photographic and fishing techniques, to be approximately 1.05 million tons. These results, and others reported in Res.Doc. 76/VI/54, for the capelin in Div. 2J and 3K suggest that the fishing mortality generated by the fishery under the present quota regulations is quite low. The results of Spanish length sampling in Divisions 3N & 3O in June-July showed a predominance of female capelin in the commercial catches (73% female; 27% male) and a large size composition for males. A larger length at age for males was also observed in Canadian samples of mixed immature and adult capelin from Div. 3K in November 1975.

Amongst other investigations reported in the Subarea in 1975 were further Canadian catch sampling and tagging of mackerel and herring in Newfoundland waters, a Canadian salmon tagging experiment (27 large salmon and 38 grilse released) in Trinity Bay (Div. 3L) in May-June, exploratory fishing for squid by Spain in June-July (Res.Doc. 76/VI/3) and further French studies of the scallop (Chlamys islandicus) population on Saint Pierre Bank (Subdiv. 3Ps) in October-November.

