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Status of Fisheries and Research Carried out in Subarea 3 in 1974

by

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Information on the status of fisheries and research carried out in Subarea 3 in 1974 are contained in the following summary and research documents:

Summary Documents: 75/4 (Report of Environmental Working Group), 11, 12, 13, 15, 18 (Report of Assessments Subcommittee), 24, 25, 27, 28, 29, 30.

Research Documents: 75/2, 3, 5, 6, 7, 14, 22, 23, 24, 25, 26, 27, 28, 32, 40, 45, 52, 55, 63, 72, 73, 76, 78, 79, 83, 84, 85, 86, 90, 96, 101, 103.

I. Status of Fisheries

Nominal catch statistics for the main species exploited in Subarea 3 in each of the years 1970-74 are given for all countries combined in Table 1 and by country for the two years 1973 and 1974, in Table 2.

Table 1. Nominal catches of main species in Subarea 3 1970-74 (000's tons).

	1970	1971	1972	1973	1974*
All Species	971	954	958	996	933
Cod	533	514	524	464	409
Redfish	81	102	123	110	116
Greenland Halibut	26	14	18	15	11
American Plaice	89	80	71	72	60
Witch	22	31	28	33	23
Yellowtail Flounder	27	38	40	34	25
Roundnose Grenadier	23	18	21	11	23
Herring	135	118	52	17	18
Capelin	3	3	53	209	202

*Provisional figures

see ICNAF Annu. Rept. Vol. 25, p. 105

Table 2. Nominal catches of main species by country in Subarea 3 1972 and 1973 (000's tons).

Species	Year	Bul	Can	Den	Fra	FRG	GDR	Jap	Nor	Pol	Por	Rom	Spa	USSR	UK
Cod	1973	+	72	12	7	29	22	-	8	25	87	2	106	90	4
	1974	-	59	6	12	8	6	-	3	9	84	-	110	109	4
Redfish	1973	+	15	+	+	4	3	3	+	4	6	+	-	74	1
	1974	-	10	-	+	6	1	1	-	3	4	-	-	85	5
Greenland	1973	-	7	+	-	1	1	-	+	2	+	+	-	4	+
Halibut	1974	-	6	-	+	+		-	+	2	+	-	-	3	+
American	1973	-	52	-	1	+	+	-	-	1	-	+	-	16	+
Plaice	1974	-	42	-	1	+		-	-	1	-	-	-	15	1
Witch	1973	-	12	-	+	1	2	-	-	12	1	+	-	4	+
	1974	-	7	-	+	1		-	-	2	+	-	-	12	+
Yellowtail	1973	-	29	-	+	-	+	-	-	-	1	+	-	4	-
Flounder	1974	-	17	-	+	+		-	-	-	+	-	-	7	-
Roundnose	1973	-	-	-	-	-	+	-	-	+	-	-	-	11	-
Grenadier	1974	-	-	-	-	+		-	-	+	-	-	-	23	-
Capelin	1973	-	6	-	-	-	-	-	41	2	-	-	-	160	-
	1974	-	15	-	-	-		-	43	7	4	-	4	129	-

+ = less than 500 tons

The data in Tables 1 and 2 indicate that total fishery production in Subarea 3 in 1974 was almost 60,000 tons lower than in 1973. This was due principally to a decrease in the cod catch, especially by the Canadian, FRG, GDR and Polish fisheries. The decrease in the Canadian cod catch was mainly attributable to the inshore fishery which was hampered by severe ice conditions in the northern divisions. The drop in the FRG, GDR and Polish catches, on the other hand, was mainly due to a shift in the main grounds fished in 1974 from the northern divisions of Subarea 3 (Divs. 3K-L) to Subarea 2 (Divs. 2H and 2J), where ice conditions offshore were more favourable than in 1973. Their cod catches in Subareas 2 and 3 combined were, in fact, slightly higher in 1974 than in 1973 (FRG:1973 = 35,800t, 1974 = 36,400t: GDR:1973 = 23,900t, 1974 = 25,100t: Poland:1973 = 28,300t, 1974 = 33,200t). The catch-per-unit-effort of cod in the FRG trawl fishery in Divs. 2J, 3KL was, however, lower than in 1973 and continued the downward trend of recent years.

The total redfish catch in the Subarea was slightly higher in 1974 than in 1973, due mainly to a 10,000t increase in the USSR catch in Divisions 3M and 3N. The Canadian catch in Divisions 3Pn and 3Ps was, however, 5,000t (33%) lower due mostly to reduced production by mid-water trawlers.

The provisional statistics for 1974 indicate that the catches of all of the main flatfish species were generally lower than in 1973. This decline was most marked in the Canadian fishery in which the decreases ranged between 14% and 45% (Yellowtail) for the different species. Although this was partly due to the adverse effects on fishing of severe icing in the northern Divisions, it was attributable mainly to reduced stock abundance following recent increases in fishing intensity.

In 1974, the roundnose grenadier catch by the USSR fishery increased from the relatively low 1973 level to the level of the immediate preceding years.

The total catch in the large, recently developed capelin fishery in Subarea 3 and Division 2J, principally by the USSR and Norway was maintained in 1974 at approximately the same level as in 1973. Although the USSR catch in Subarea 3 (Divs. 3K, L, N, O) was some 30,000t lower, this was compensated by a higher catch in Div. 2J. There was an approximate doubling of the Canadian catch of capelin in the Subarea (mainly in Divs. 3K, L, N and Ps) from 6,000-15,000t due to a signficant increase in fishing effort. The distribution of capelin catches within the Subarea in 1974 showed some significant differences from 1973. Whereas in 1973 the bulk of the catch south of Div. 3K was taken on the southern part of the Grand Bank (Divs. 3N & O), in 1974 a substantial catch (60,000t) was taken in its northern part (Div. 3L).

The herring catch in the Subarea increased slightly from 17,000 in 1973 to 18,000 tons in 1974, due to increased fishing effort, but it remained low compared with earlier years. The haddock catch also remained very low.

II. Research carried out in the Subarea

a) Environmental Studies

Hydrographic observations were carried out in the Subarea in 1974 by Canada, France, USSR and USA in accordance with plans drawn up by the STACRES Environmental Subcommittee. Temperature conditions were not markedly different from the average of recent years, although USSR observations indicated that in spring and summer cooling occurred mainly in the core of the Labrador current with the result that temperatures corresponded with those in the cold year 1972. These studies also showed that the intensity of the Labrador current in this area and on the south-eastern slope of the Grand Bank was low relative to the long term mean.

Plankton observations, made in the Subarea by the UK Continuous Plankton Recorder survey showed that the spring outbursts of phytoplankton and copepods

were late, in continuation of a trend since 1968. They also showed a continuation of the downward trend starting in the early 1960s in the abundance of all species of copepods except adult Calanus and Euchaeta norvegica. These latter species together with Euphausids, which have increased in abundance, form the main part of the zooplankton in the area and have maintained the total zooplankton biomass. The numbers of fish larvae recorded in the Recorder samples in Subarea 3 in 1974 were again very low.

b) Fish Stocks

Sampling of the commercial catches of the principal species exploited in Subarea 3 was undertaken in 1974 by the main fishing countries. These data (summarised in Summ. Doc. 75/4), together with the results of research vessel fishing surveys (by Canada, France and USSR) and other biological studies were used in further stock assessments and TAC calculations by the STACRES Assessments Subcommittee (given in Summ. Doc. 75/18).

Cod

Canadian investigations showed that in the coastal trap fishery, the dominant year-classes in Division 3K were those of 1969 and 1968, while in Divisions 3L and 3Ps the 1969 and 1970 year-classes were the strongest. The 1968 and 1969 year-classes were also the dominant ones in the offshore fishery in the southern Divisions. USSR groundfish survey data indicate that the strengths of recet year-classes in the northern cod stock in Divisions 2J and 3KL are low as a result of which a decrease in stock abundance is to be expected in the next few years. In Division 3M (Flemish Cap) on the other hand the stock abundance is expected to increase owing to the very strong 1971 and 1973 year-classes. In the southern Divisions (3N, O, P), recent year-classes are about average strength and are expected to maintain the stock at about its present level. USSR egg surveys (Res. Doc. 75/101) in Subareas 2 (Div. 2J) and

3 (Divs. 3K, L, N, O) in May-June 1974 gave a substantially higher average catch per haul than in the four previous years.

Preliminary results from a French cod tagging experiment in the Gulf of St. Lawrence (Div. 4R) and on Rose Blanche and Burgeo Banks in Div. 3P in January-February support those of earlier experiments in confirming the migratory pattern of this cod stock.

Results of comparative studies revealed considerable differences in the age readings of cod from Subarea 3 and derived age compositions between Spanish and Canadian experts.

Redfish

USSR surveys in 1974 indicated an increase in the abundance of the exploited redfish (Sebastes mentella) stock in the Flemish Cap area (Div. 3M), due to the recruitment of the relatively strong 1963, 1964 and 1965 year-classes. Their recruitment resulted in a decrease in the mean length and age of research vessel and commercial catches, the modal size of which ranged between 27 and 30 cm. This was also the case with Polish redfish catches in this area, which had a mean length of 28.8 cm. A Canadian assessment of this redfish stock suggested that the maximum sustainable yield under equilibrium conditions is less than half the 1972 catch of 42,000t.

Redfish sampled in the Polish redfish fishery in Divisions 3K and L ranged in length between 21 and 58 cm with an average of 38.0 cm.

A Canadian redfish bottom trawl survey in Division 3Ps which revealed marked diurnal changes in catch rates, showed a predominance of eight and nine year old fish in the area surveyed. An assessment of the redfish stock in Division 3P indicated a sustainable yield at the $F_{0.1}$ level of less than 24,000t at the recruitment levels prevailing in the years 1964-73.

Flatfish

Canadian groundfish surveys on the Grand Bank (Divisions 3L and N) in 1974 indicated a decline in the abundance indices of American plaice and yellowtail. This was most marked for yellowtail in Division 3L, possibly due to the low temperatures in that area or possibly due to reduced stock abundance. Growth studies of Grand Bank yellowtail showed a growth rate similar to that reported previously for yellowtail on the Scotian shelf, but lower than that for the New England yellowtail stocks, probably due to differences in temperature. Results of new Canadian assessments of American plaice in 3Ps, Greenland halibut in Subarea 2 and Divisions 3K,L and of witch in Divisions 3N,O were reported to the STACRES, Assessments Subcommittee.

Capelin

With the rapid growth of the capelin fishery in Subareas 2 and 3 in recent years there was a marked increase in the research effort on this species in 1974. USSR investigations (Res. Docs. 75/7, 75/84) on the distribution and migrations of capelin in the Newfoundland area showed that prespawning concentrations were widely distributed in Divisions 3L, N, O and P in March-May. They migrated southwards during late May-early June to the main spawning area on the south-eastern shoal of the Grand Bank (Div. 3N) where they spawned in the period mid June-mid July. After the spawning season the main capelin concentrations were found further to the north in Divisions 3K and 2J where they fed intensively on pelagic crustacea in the period July-October; overwintering concentrations were subsequently located in the southern part of Division 3K and the northern part of Division 3L in November-December. Age compostion data showed that the spawning stock consisted principally of 3-5 year-olds. USSR and Norwegian (Res. Doc. 75/3) echosounder observations indicated marked diurnal changes in the density

and behaviour of capelin schools; in daylight the schools were deeper and more densely packed than at night. As a consequence the Norwegian fishery was restricted to daylight.

Results of Canadian, Norwegian and USSR assessments of capelin stock size from echosounder surveys and predation studies (Res. Docs. 75/2, 75/3, 75/6, 75/7) were presented to the Assessments Subcommittee in its consideration of the potential sustainable yields and TACs for this species.

Herring

Canadian investigations indicate that although the 1970 year-class in the southern Gulf of St. Lawrence autumn spawning herring stock complex, which overwinters along the southwest coast of Newfoundland, is a strong one it is insufficient to increase substantially the currently low stock biomass. Comparative growth studies suggest that growth and recruitment in this stock is depressed through competition with mackerel. Recruitment by the 1972 year class to the spring spawning stock in south-eastern Newfoundland waters was also relatively good and arrested the decline in stock size experienced during recent years.

Mackerel

Canadian catch sampling studies showed that the 1967 year-class was again the dominant one in the exploited mackerel stock in Subarea 3 in 1974, but the 1971 year-class also contributed significantly to the catches. Further recaptures in Subareas 4, 5 and 6 of mackerel tagged in Newfoundland coastal waters provide further evidence of a close interdependence of the mackerel stocks fished in these subareas.

Haddock

Canadian research vessel fishing surveys in 1974 showed that the haddock stocks in Subarea 3 remained at a low level.

Salmon

137 salmon and 23 grilse were liberated in a Canadian tagging experiment in Conception Bay, eastern Newfoundland between 14 May and 12 June 1974. Of 35 salmon recaptured, 83% were from Newfoundland waters and 17% from the Canadian mainland (Maritimes and Quebec). Of 7 grilse recaptured, 58% were from Newfoundland waters and 43% from the mainland. Sampling of commercial salmon catches was continued, to provide information on size and age compositions and their seasonal variations.

28 reports were received of pink salmon belonging to the small stock established in the North Harbour river, Newfoundland following egg transplantations from British Columbia in the early 1960s.

Sandeel

Further investigations of the distribution, abundance and biology of sandeel were conducted by the USSR in Divisions 3 L, N, O, P in May–July and November–December 1974. The largest catches were taken in the south-eastern shoal of the Grand Bank, the fish ranging between 19 and 23 cm in length and 3 and 4 years in age. Fecundity estimates ranged between 7,200 and 26,800 eggs per female. Fish stomach analyses showed that sandeel is one of the main food items in the diet of a number of fish species, especially cod, throughout the year.

Shellfish

A French dredge survey of Placopecten magellanicus and Chlamys islandicus stocks on St. Pierre Bank (Div. 3Ps) in winter 1974 indicated that the former had been reduced to a low level due to intensive exploitation, but that the abundance of the latter is sufficient to sustain a controlled exploitation.