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ANNUAL MEETING - JUNE 1970Status of Fisheries and Research Carried Out in Subarea 4 in 1969

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A. Status of the Fisheries

During 1969, Canada, Germany, Poland, Portugal, Spain, USSR and USA have reported catches in Subarea 4. The main species fished have been cod, haddock, redfish, silver hake, American plaice, pollock, white hake, witch and argentine for groundfish; herring and mackerel for pelagic fish; and sea scallops for molluscs.

The table below compares the catches of these species in 1968 and 1969 (ICNAF Res.Doc.69/96 and Res.Doc.70/31). This table does not include the 1969 catches of France, Romania and non-member countries that may have fished in Subarea 4.

For some species - cod, haddock and mackerel, in particular - there have been some decreases in catches, while for others - silver hake and herring - the increases are quite important.

Regarding cod, the trend has been a decrease. Nevertheless, referring to the most important catches, Canada has reported that those from the Gulf of St. Lawrence and Cape Breton areas continued to increase since 1967, while for those from Nova Scotia Banks the catches are slightly below the 1967 level. The situation is partly attributed to changes in effort from the southern to the northern banks.

The haddock fishery continued to decrease due to the poor year-class after 1963. This situation tended to divert some fleets (Canada, USSR) to other areas, and other species. No changes are expected for the next years since the pre-recruit year-classes are poor.

Canada continued to increase landings of redfish (since 1963); about 85% of the catches come from the Gulf of St. Lawrence. USSR figures also show an increase. Poland reports good catches, Germany a small quantity, and USA a big decrease.

Silver hake: USSR catches show a marked increase from 3.4 thousand tons to more than 46,000. This figure is very near to the catches made in 1965 following the big peak of 1963/64; 1967 and 1968 have been very poor years and now it seems that the stocks are recovering with the incoming of the new 1966 and 1967 year-classes, very much better than those of 1964 and 1965.

For American plaice, pollock and white hake, the changes are small compared to the 1968 catches.

The Canadian catches of herring decreased, but in some divisions (4T and 4W) the catches were bigger. Germany reports an important increase

SUBAREA 4

	Canada		France*		Germany		Poland		Portugal		Spain		USSR		USA		TOTAL
	68	69	68	69	68	69	68	69	68	69	68	69	68	69	68	69	
Cod	150.6	138.3	23.5		0.6	0.1	6.9	1.6	59.0	44.9	5.9	2.8	0.9	0.4	246.8	188.9	
Haddock	38.8	37.8					3.3	2.0	0.6	0.2	3.2	1.8	45.9	41.8			
Redfish	81.4	86.4	0.8	0.1	6.9		0.2	2.2	21.0	13.3	103.4	108.9					
Silver Hake							3.4	46.2			3.4	46.2			3.4	46.2	
American Plaice	18.3	17.9	0.2												18.5	17.9	
Pollock	16.3	13.6					0.8	1.2	0.2	0.3	0.6	17.6	15.4				
White Hake	4.5	6.8													4.5	6.8	
Witch	10.9	10.5	0.1												11.0	10.5	
Mixed Flounder	5.3	4.2												29.8	12.9	35.1	17.1
Herring	334.5	328.6			10.7	23.2	0.7	4.9	2.8	65.6					348.7	422.3	
Mackerel	10.9	13.0							9.4	4.1					20.3	17.1	
Argentine									1.6	4.1					1.6	4.1	
Sea Scallops	12.4	14.2													12.4	14.2	

* Does not include catches for 1969

due to a higher effort, although the catch per day shows a strong decline. Poland catches were also bigger in 1968. USSR figures show an increase of 2.8 thousand tons in 1968 to 65.6 thousand tons in 1969.

Concerning mackerel, the Canadian catches were bigger in 1969 than in 1968; the USSR catches were somewhat lower. These differences may be attributed to variation of effort rather than to the availability of the species.

Only USSR has reported catches on argentine. In 1969 they amounted to 4.1 thousand tons compared to 1.6 thousand tons in 1968, almost the same as in 1967, but still lower than 1966 catches (15 thousand tons). Again these figures can reflect a variation of effort, the fishing boats aren't searching specially for this species.

Canada reported catches on witch in 1969 (10.5 thousand tons).

Sea scallop: only Canada presents catches on this species. Total landings of scallops increased from the 1968 figure of 12,400 MT to 14,245 MT whole weight (1,716,000 KG meats). By far the largest fraction of inshore landings came from 4T.

4T produced 8,605 MT; 4X produced 4,119 MT; 4V and 4W together produced 1,036 MT. A new area in 4W was fished in 1969 (Western Bank) and produced 923 MT.

B. Hydrographic Studies.

Investigations made by Canada (Res. Doc. 70/10) include the study of water circulation in relation to internal tides, water properties (salinity, temperature and heat budget) and ice forecast survey. A strong surface drift southwest current was reported in Gulf of Maine in the winter of 1969. In Laurentian Channel there is evidence of a northerly bottom drift. Surface temperatures along the coast were generally warmer than in 1968 and above the long-term averages at all seasons. The temperature of the Cabot Strait deep layer increased from about 4.3°C. in 1966 to 5.4°C. in 1969.

Germany (Res. Doc. 70/13, Part III; Res. Doc. 70/94) has carried out four hydrographic sections.

USSR (Res. Doc. 70/20) reports hydrographic observations. The data shows that in 1969 the water temperature was higher than in 1968. In the Nova Scotian Channel the bottom temperature ranged from 5°C. to 10°C (2° to 3°C lower in 1968). Res. Doc. 70/50 is an extensive study of the regime of the water, based on data collected by AtlantNIRO expeditions from 1962 to 1966. The authors have concluded that the water has generally been cooling since 1964 to 1966, inclusive.

USA hydrographic cruises also include the southern part of Subarea 4 (Res. Doc. 70/22).

C. Biological Studies.

1. Cod. Canada (Res. Doc. 70/10) has continued the study of eggs and larvae in relation to recruitment studies. In the Gulf of St. Lawrence the 4 and 5 year-classes are dominant. According to the Spanish observation, the 1962, 63 and 64 year-classes were dominant in sampling, specially the 1963 one (Res. Doc. 70/19). Tagging experiments by Canada confirmed that fish move seasonally from Magdalen Shallows in summer to Laurentian Channel in winter.

Spain (Res. Doc. 70/19) presents some data on length and age composition and on sex-ratio as well. Fifty-seven to fifty-nine cm. and age six were the predominant groups.

Germany (Res. Doc. 70/13, Part III) gives some data on cod. The mean lengths ranged from 48.7 cm. to 60.6 cm. for division 4Vn and one sample from division 4X gave 74.3 cm.

2. Haddock. Canada investigated the recruitment of the fishery: the recruitment is low and the 1968 year-class is poor. Tagging experiments have shown that the summer fishery in southeastern Bay of Fundy (4X) is based mainly on fish which migrate to Browns Bank area for winter and spring months. Res.Doc. 70/74 (Canada) refers also to this species. The main results obtained are: the average fishery mortality for the haddock of the eastern Scotian Shelf over the past 10 years was close to that giving the maximum yield; the recent decline in abundance reflects a failure in recruitment to the traditional fishery, in large part due to an intensive catch made by some countries on young fish. Another paper presented by Canada (Res.Doc.70/75) gives some more information on this species for Div.4T-V-W: the predictions for recruitment indicate that in 1970-72 it will remain poor; the fishing mortality is still high, which means that the stock abundance will show a substantial decline by 1972 unless further regulatory measures are put in force. The catch quota to prevent a further decline below 1967-69 levels has to be less than 9,000 tons. USA has continued the cooperative studies with Canada on 4X haddock (Res.Doc.70/22). The figures of the assessments of the fishing intensity corresponding to the maximized yield indicated that for 1970 the quota should be about 12,000 tons, somewhat less than the estimation made previously (18,000 tons for the period 1970-72). USA conducted also some studies on mortality, abundance and recruitment. Year-classes since 1963 have been poor, 1969 being, perhaps, a little better. So the recruitment for next year will be poor too.

Germany (Res.Doc.70/13, Part III) has some length measurements from divisions 4Vs (mean length = 44.8 cm), 4W (m.l. = 51.7 cm) and 4X (m.l. = 49.6 cm).

3. Redfish. France (Res.Doc.70/54) presents a preliminary study on this species, including observations on lengths, ages, sex ratio, weight and growth.

4. Argentines. Canada (Res.Doc.70/10) indicated that work on fecundity of argentines is in progress; Poland (Res.Doc.70/64) also studied this species: 1959 and 1960 year-classes were found to be the most abundant; the range of lengths and ages were from 13 to 42 cm and from 3 to 29 years, respectively. It includes some data on growth and on mortality. USSR studies on this species (Res.Doc. 70/20) comprise observations on meristic characters and growth.

5. Other Groundfish. Canada (Res.Doc.70/10) reports some studies on silver hake (incidence and intensity of gill diseases in Div.4V, 4W and 4X), on flatfish and sand lance.

Germany (Res.Doc.70/91) presents some results on silver hake from Div.4W.

6. Herring. Canada (Res.Doc.70/10 and Res.Doc.70/78) indicates that the recently expanded summer-autumn fishery conducted on this species off the Nova Scotia coast in the Bay of Fundy area (4X) had caused a marked reduction in the availability of adults by 1969. Racial studies of 4T and southwest Newfoundland herring indicate that these are derived from the same stock complex (Res.Doc. 70/77). The strong 1959 and 1960 year-classes in Div.4T were again dominant, although to a lesser degree than in previous years. The 1964 and 1965 are also strong. Canadian observations include also morphometric and meristic characters in order to separate spawning groups, and also plankton cruises to study the distribution and abundance of larval herring; the most important places were found in Bay of Fundy (Res.Doc.70/52). Some attempts have been made by Canada to survey a herring spawning bed from a submersible. Canada also reports data on vertebral numbers of the herring of the Bay of Fundy (Res.Doc.70/82). Germany (Res. Doc.70/13, Part II) presents data on lengths, maturity stages, vertebral counts, gillrakers and age compositions for herring in Div.4VW. Poland observed that the lengths of fish ranged from 26 to 38 cm (average = 32.3 cm), and that the age-groups III to XIII (and probably older also) were present in the fishery (Res.Doc. 70/16 and Res.Doc.70/62). USSR (Res.Doc.70/20) made observations on length and age compositions of catches in 4V.

7. Sea Scallops. Canada (Res.Doc.70/10) gives some results on the studies made in Div.4T on drag efficiency and survival of discards. A photographic survey in Bay of Fundy (4X) in August 1969 indicated that there is the scarcity already mentioned by fishermen. Direct observations made by a research submersible in September led to the estimation of a density of less than 0.1 scallop per sq m over the commercial grounds.

D. Other Studies.

1. Joint USA-USSR Groundfish Survey in Subarea 4. The third joint survey was conducted in 1969 in order to get information on abundance indices for groundfish (Res. Doc. 70/80).

2. Plankton Recorder. UK (Res. Doc. 70/21) conducted a survey in Subarea 4 with the continuous Plankton Recorder. 4,476 miles have been sampled. The young stages of Calanus were abundant in the coastal regions in June; the young stages of Sebastes were scarce, as in 1968.