RESTRICTED

INTERNATIONAL COMMISSION FOR THE NORTHWEST ATLANTIC FISHERIES

Serial No.2102
(D.b)

ICNAF Res.Doc.68/104
(Revised)

ANNUAL MEETING - JUNE 1968

Summary of research and status of fisheries in Subarea 4

by R. Monteiro

A. Status of Fisheries

In Subarea 4 during 1967, the main species fished have been cod, haddock, redfish, silver hake, American plaice, pollock and white hake for groundfish, herring, mackerel and argentine for pelagic fish and sea scallop for molluscs.

The countries that have fished significantly during the past two years are Canada, France, Portugal, Spain, USSR, UK and USA. The table below compares the catches of the above-mentioned species during 1966 and 1967.

Regarding cod, all countries, except UK and USA, show a decline in catches due, probably, to the reduced effort in Div.4X; the UK increase is a consequence of the expansion of the freezer trawler fleet, whereas that from USA is related to the rise in effort of the haddock fleet.

Subarea 4 ('000 tons)	Canada		France		Portugal		Spain	
	1966	1967	1966	1967	1966	1967	1966	1967
Cod	128.5	122.1	16.2	12.4	10.8	7.4	47.3	43.9
Haddock	40.2	40.7					3.1	2.0
Redfish	62.5	63.9		0.4				
Silver hake								
American plaice	18.9	18.2						
Pollock	14.3	12.2						
White hake	9.0	7.8					2.3	1.7
Herring	233.1	260.0						0.4
Mackerel	11.5	11.0						
Argentine								
Sea scallop	5.1	7.0						

	USSR		UK		USA		Total	
	1966	1967	1966	1967	1966	1967	1966	1967
Cod	11.0	1.7	0.3	5.2	1.0	1.5	215.3	194.3
Haddock	20.6	0.8			2.5	5.0	66.1	48.5
Redfish	13.9				29.4	22.0	106.1	86.5
Silver hake	10.3	2.5					10.3	2.5
American plaice								
Pollock	7.3	0.3			0.1	0.2	19.0	18.4
White hake	2.2	0.3			0.8	0.5	24.7	14.8
Herring	2.2	0.6				0.2	11.3	8.7
Mackerel	1.2						235.5	260.0
Argentina	15.0	4.2					12.7	11.2
Sea scallop							15.0	4.2
							5.1	7.0

Spain and USSR show a decrease in haddock catch which can be explained by the fact that following the richer 1962 and 1963 year-classes, very poor ones have appeared; nevertheless, USA catches doubled as a result of the increase of abundance in Div.4X and specially of the rise in effort.

Regarding redfish, the only marked differences are those of USSR without any catches during 1967, and of USA with a reduction of 25%, a consequence of the reduced abundance and effort in Div.4V, W and X, which could not be compensated by the catches and yields obtained by this country in Div.4R, S and T.

In this subarea, only USSR has fished silver hake but the reduction in catch is quite sharp. This is explained by the relatively poor year-classes that entered the fishery after 1964 and, consequently, by the reduction of fishing effort since the Soviet fleet has moved to other regions.

The American plaice catches remained steady and the reduction in pollock is due to generally smaller catches, especially those of Spain and USSR. The white hake also shows a little reduction.

Among the pelagic species, the herring, almost exclusively fished by Canada, increased by about 20% in Div. 4T and 4X; the mackerel catch has not changed and the argentine, all caught by USSR, dropped markedly.

The variation in the sea scallop catch (Canada) has not been important.

B. Hydrographic Studies

Canada, France and USSR report hydrographic observations.

Canada (Res.Doc.68/5) studied both coastal surface temperatures from Bay of Fundy to the Gulf of St. Lawrence and found that surface temperatures were, in general, lower than in 1966 in Div.4W and 4X; the bottom temperatures at the entrance of Bay of Fundy was found to be the lowest since 1930, as well as at Cabot Strait (4V) where the cold conditions have continued. Circulation studies based on recoveries of drift bottles and sea-bed drifters, a survey of the western Gulf of St. Lawrence and a detailed study of an inshore bay (St. Margaret's, Div.4W), the latter for the knowledge of the rate of exchange of bay and outside waters, the circulation within the bay and seasonal temperature and salinity distributions were also carried out. Besides this, a detailed program in the Scotian Shelf to obtain time series temperatures, current speed and direction data at depths ranging from 80 to 1,000 m was initiated in January.

France (Res.Doc.68/7) reports temperature and salinity measurements made during March and April. The conclusions obtained refer to surface and bottom temperature and to vertical distribution as well.

The results from USSR (Res.Doc.68/15) indicate that the process of the winter cooling in the Nova Scotia area was less intensive than in 1966 and the temperature from surface to bottom was somewhat higher too. In summer the same occurs over the Nova Scotia shelf with exception of the area of Browns, Roseway, LaHave Banks and the shallow of Sable Island.

C. Benthic Studies

Canada (Res.Doc.68/5) gives information on some studies made on sedimentology and geochemistry of the Gulf of St. Lawrence. A physiographic chart of the Laurentian Channel and Gulf of St. Lawrence has been prepared.

D. Biological Studies

Some biological aspects of the following species have been studied by several countries (Res.Doc.68/5 and 68/61 (Canada); 68/7 (France); 68/15 (USSR); 68/17 (USA)).

1. Cod. Canada continued with the study of cod stocks, in particular from Div.4T in order to know the modification that, eventually, can come from mesh regulations. The results, which need to be tested, indicate a large 1964 year-class to enter the fishery in 1968 Some studies were also made regarding the recruitment rate in the Gulf of St. Lawrence.

2. Haddock. According to Canadian studies, the previous estimates made on the weakness of the 1964 and 1965 year-classes (Div. 4V,W) were confirmed and, in addition, it has been seen that the 1966 year-class is poor too. Groundfish surveys were carried out by the USA in Div. 4X.

USA and Canada have continued the observations on age and length compositions in Div. 4X in order to get estimates of mortality rates and effects of fishing. The data are being analyzed.

3. Redfish. Canada observed very good new year-classes (1956 and following) in Div. 4R, S and T, following a period of 8 years of poor year-classes. In May, in the Gulf of St. Lawrence, a successful 1966 year-class was detected, with a modal length of 8 cm.

According to the French Research Report (68/7), the lengths of redfish from Nova Scotia Banks (Div. 4Vs and W) range between 8-44 and 5-40 cm. respectively.

4. Other Groundfish. Canada reports studies on hake, pleuronectids, silver hake and sand launce. From these species, silver hake has been investigated in order to establish stock separation and to know what is the influence of a gill disease on periodic fluctuation of abundance.

USSR also reports studies on age determination and feeding of silver hake. The captures have included mainly 3, 4 and 5-year-old specimens.

5. Herring. Canadian studies on this species deal with the effects of increased exploitation on the stocks, length and age compositions, spawning, fecundity indices and fatness. The results show that in the Bay of Fundy and Gulf of St. Lawrence no major changes occurred in the stocks as a result of the exploitation. In New Brunswick stocks (Div.4X) the 1965 year-class was dominant until September and afterwards the 1966 year-class entered the fishery. A great part of the exploited stocks consist of juveniles. A comparison of length compositions between New Brunswick and Nova Scotia stocks (Res.Doc.68/68) shows that in the first stock the fishes are recruited at the end of their first year, while in the second stock they are recruited at the end of their fourth year. The 1963 year-class was dominant in 1966 and 1967; the 1960 year-class in 1964 and 1965; the 1962 and 1964 year-classes were relatively poor. The spawning survey (Res.Doc.68/5) was conducted in Chaleur Bay; during spring the spawning was light to moderate over a large inshore area on the south side of the bay. Autumn spawning occurred in deeper water and later than usual due, probably, to the fact that the water temperature has been high early in the season. The fecundity studies give a mean of 55,000 eggs for a herring of mean size (32.4 cm) from a spring spawning stock in Div.4T (Res.Doc.68/5). Regarding fatness, the lowest values were obtained from small herring (10-15 cm) in Div.4X during the spring; the highest values were obtained from large herring (30-35 cm) in Div.4T during late summer and early autumn.

USA (Res.Doc.68/35) reports some studies on age, length and maturity of this species in comparison with samples from Subarea 5.

Canada (Res.Doc.68/67) gives some information on the evolution of herring landings by types of gear during the period 1963-1966; during the first and last part of the year, the species is mainly caught by seines, while during the middle of the year the weirs caught more quantity; the catches by gill nets represent only a small proportion, especially between May and September.

6. Other Pelagic Fish. Canada, France and USSR (Res.Doc. 68/5, 68/7 and 68/15 respectively) present studies on some other pelagic species, namely on mackerel, swordfish, tuna, salmon and argentine. In particular for the size composition of Canadian swordfish catches, Res.Doc.68/69 gives some indications.

7. Other Studies. UK (Res.Doc.68/16) proceeded with the program of the Continuous Plankton Recorder over 2,900 miles in Subarea 4. Some results are already available as far as diatoms and Calanus are concerned.

Canada (Res.Doc.68/61) presents a study on the stock distribution of the commercially exploited species such as cod, haddock, redfish, halibut, silver hake, plaice, witch, yellowtail, winter flounder, wolffish, pollock, white hake, cusk, herring and mackerel, Also for five other species that are abundant in Subarea 4 but are only lightly exploited. Research is being carried out on sand launce and argentine, but the distribution charts are not yet available.

An intensive study of the estimation of the fishing activity in the subarea is submitted by Canada (Res.Doc.68/64).