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Status of Fisheries and Research carried out in Subarea 3 in 1970

by

H. A. Cole

I. Pertinent Documents

The following research documents contain information relating to Subarea 3: 71/6, 11, 22, 26, 27, 28, 29, 30, 31, 32, 36, 38, 39, 42, 43, 44, 45, 46, 48 50, 51, 53, 54, 55, 62, 82, 83, 91, 93, 95, 96, 97, 104, 107, 108, 109, 111, 119, 120, 121, 123, 128.

Documents relating solely to salmon are not included.

The latest information regarding the state of the fish stocks and the most recent assessments are given in the Report of the Assessments Subcommittee and in the report of its Mid-Year Meeting (Comm.Doc. 71/1).

II. Status of the fisheries

Table I gives the total nominal catches from Subarea 3 of all species, and of cod, haddock, redfish and herring considered separately, for the year 1970 and the four preceding years. It should be noted, however, that the 1970 catch data include a small amount of fish caught in Subarea 2, and in 1969 and 1970 do not include catches by all non-member countries.

Table I. Nominal catches from Subarea 3 (thousand metric tons round fresh)

	1966	1967	1968	1969	1970
All Species	748	1,103	1,144	983*	964*
Cod	499	721	733	569*	537*
Haddock	10	11	7	5*	7*
Redfish	79	89	53	87*	76*
Herring	23	79	145	145*	135*

* Incomplete, see note above.

Table 2. gives the nominal catches of selected other species from Subarea 3 for the years 1968, 1969 and 1970.

Table 2, Nominal catches of other species taken from Subarea 3, 1968-70 (metric tons round fresh)

Species	1968	1969	1970
Halibut	1,388[a)]	597*	794*
Greenland halibut	24,003	17,690*	22,729*
American plaice	55,997	70,959*	88,317*
Witch	5,414	4,477*	21,726*
Yellowtail flounder	5,001	10,564*	26,730*
Flounders (not specified)	66,177	37,049*	481*
Roundnose grenadier	24,159	11,682*	22,396*

* Incomplete, see note above.

a) Includes some Greenland halibut caught by non-member countries.

Table 3. gives the nominal catches in Subarea 3 by species and countries for the years 1969 and 1970. As noted above, the latter are not quite complete. If it is assumed that Denmark and non-menber countries caught the same weight of fish in 1970 as in 1968, then the total catch of all species in Subarea 3 may have decreased by about 20,000 tons. Catches by most member countries differed very little from those taken in 1969 but that of France decreased by 20,000 tons.

Cod

Although the information is not yet complete, it seems that cod catches declined very slightly in 1970. Catches by Portugal, Spain and the USSR remained very stable but that of Canada decreased by approximately 10%. The French catch was less than half of that taken in 1969.

As in 1969, the heaviest catches were made in the northern part of the Subarea, particularly in Divisions 3K and 3L but production from these two divisions fell from 329,000 tons in 1969 to 286,000 tons in 1970.

Landings of cod from the Canadian inshore fishery declined but intermediate-sized vessels are changing over to gill nets and a variety of other species is also being caught (Res.Doc. 71/43).

Polish fishing was mainly in Div. 3K: the catch per hour by Polish trawlers fishing cod in the first half of 1970 fell to 644 kg. (1968 - 1163; 1969 - 1013kg.) (Res.Doc. 71/104). The year-classes 1963, 1964 and 1965 made up 77% of the catch

Table 3. Nominal catches from Subarea 3 in 1969 and 1970 by species and country (thousand metric tons round fresh). Not including one non-member country.

Species	Year	Total	Canada	Denmark	France	Germany	Norway	Poland	Portugal	Spain	USSR	UK	USA	Non members
Cod	1969	569	145	19	36	Ø	26[f]	14	99	171	57	3	Ø	Ø
	1970	520	129	na	14	12	37[f]	13	91	165	60	Ø	Ø	na
Haddock	1969	5	3	Ø	1	-	-	-	-	2	-	Ø	-	-
	1970	7	3	na	1	-	-	-	-	3	Ø	-	-	na
Redfish	1969	87	9	Ø	Ø	-	Ø	7	-	-	70	-	-	Ø
	1970	76	11	na	1	Ø	Ø	4	-	-	58	Ø	-	na
Greenland halibut	1969	18	12	-	-	-	Ø	3	-	-	3	-	-	-
	1970	23	11	na	-	-	-	7	-	-	5	-	-	na
American plaice	1969	71	70	-	Ø	-	-	-	-	-	-	-	-	Ø
	1970	88	70	na	Ø	-	-	Ø	-	-	17	-	-	na
Witch	1969	4	4	-	Ø	-	-	-	-	-	-	Ø	-	-
	1970	22	7	na	Ø	-	-	3	-	-	12	-	-	na
Yellowtail flounder	1969	11	11	-	Ø	-	-	-	-	-	-	Ø	-	-
	1970	27	20	na	Ø	-	-	-	-	-	3	-	-	na
Herring	1969	145	145	-	-	-	-	-	-	-	-	-	-	-
	1970	135	135	na	-	-	-	Ø	-	-	-	-	-	na
Total All Species	1969	983	409	19	38	Ø	27[f]	25	99	173	189	3	Ø	Ø
	1970	946	404	na	18	12	37[f]	26	91	169	186	Ø	Ø	na

na Not available
f Includes Subarea 2

(Res.Doc. 71/50). As a result of intensive fishing, the 1965 and 1966 year-classes were considerably reduced before their recruitment was completed (Res.Doc. 71/106)

Portuguese trawlers and dory vessels fished mainly in Div. 3L. The year-classes of 1963, 1964 and 1965 were most numerous in the trawl catches, as in 1969 (Res.Doc. 71/51).

The bulk of the Spanish catch was taken by pair trawlers with Divisions 3L and 30 providing 58% of the total: the 1965 and 1966 year-classes were dominant (Res.Doc. 71/48).

Soviet catches from the northern (Divs. 3K and 3L) and southern (Divs. 3N and 30) stocks of cod on the Grand Banks were similar at approximately 29,000 tons.

Recorded discard rates of cod in Subarea 3 rarely exceeded 1% (Res. Doc. 71/27).

The environmental factors responsible for the varying success of cod year-classes in the two stocks on the Grand Bank are discussed in Res. Doc. 71/111. Surveys of the abundance of young cod made by the USSR since 1958 show that recruitment to the Labrador-North Newfoundland stock is rather stable from year to year whereas in the Southern Grand Bank stock a strong year-class may be 40 to 50 times more abundant than a poor one. In Divisions 3N and 30, the 1968 year-class was very prominent in the USSR surveys and is expected to improve the Southern Grand Bank and St. Pierre Bank cod fisheries in 1972 (Res.Doc. 71/53).

Haddock

Haddock landings increased slightly coming mainly from Div.3Ps (St. Pierre Bank). The 1966 year-class is still important but the incoming year-classes of 1967 and 1968 seem to be poor (Res.Doc. 71/43). Soviet scientists continue to find some small signs of the beginning of restoration of the Grand Bank haddock stock (Res.Doc. 71/53).

Redfish

Total redfish landings declined by approximately 11,000 tons. The decline was most evident in Divisions 3K and 3N; landings increased from Div. 3Ps. Canadian echo sounder surveys confirm the existence of large numbers of pelagic redfish (Sebastes mentella) over deep water from the northern part of the Grand Bank to Greenland.

Herring

All the herring were taken by Canada, mainly from Divisions 3Pn and 3Ps. The catch was 10,000 tons less than in 1969. Numerous Research Documents dealing

with herring biology and assessment are summarized in the appropriate section of the Assessments Subcommittee Report.

Flounders

Total landings of flounders of all kinds increased by approximately 15,000 tons. For the first time, the USSR reported catches separately as American plaice, witch or yellowtail flounders, and because of this, landings of each of these three species showed apparent large increases. However, if the proportions of the USSR catch of "flounders not specified" in 1968 and 1969 were the same as reported in 1970, total catches of American plaice from Subarea 3 have remained stable at around 90,000 tons, yellowtail have doubled between 1968 and 1970 and witch have fluctuated considerably (Table 4).

Table 4. Estimated total catches of flounders from Subarea 3 - all countries.

Year	American plaice	Yellowtail	Witch
1968	89,000	12,000	29,000
1969	90,000	14,500	17,500
1970	88,317	26,730	21,726

Only negligible landings of flounders are now reported as "not specified".

The main fishing areas for American plaice are Divisions 3L and 3N and these seem to be separate populations. It is reported that, for both stocks, year-classes of comparatively equal strength enter the fishery each year (Res.Doc. 71/111).

The steady increase in abundance of yellowtail on the Grank Bank since 1962 may be related to the drastic reduction which has occurred in the haddock stock (Res.Doc. 71/118). There is no information on the strength of incoming year-classes.

Very little information is reported on witch (grey sole). Substantial landings are made from Divisions 3K (Canada, Poland and USSR), 3L (Canada), 3N (USSR) and 3Ps (Canada), with 3K the most important. Sampling information from Divisions 3Pn and 3Ps is provided by France (Res.Doc. 71/46).

Other species

Landings of Greenland halibut increased mainly as a result of higher catches by Polish and Soviet vessels. Three quarters of the total catch was taken from Div. 3K.

Landings of capelin by Canada were 2,999 tons (1969 - 2,027 tons). Canadian landings of swordfish doubled (1970 - 1,979 tons; 1969 - 969 tons). Squid remained very scarce with only 75 tons recorded from Subarea 3.

Catches of roundnose grenadier by the USSR increased to the 1968 level with 22,396 tons landed; almost all was taken from Div. 3K. A special study of this fishery concludes that intensification should be approached with caution (Res.Doc. 71/93).

Landings of argentine were made by the USSR and Japan.

Canadian salmon catches increased to 1,209 tons (1969 - 902 tons).

Groundfish landings reported in 1970 as "not specified" fell to negligible proportions but "other fish spp. nk" still total 5,896 tons in Subarea 3, the bulk being landed by the USSR.

III. Research work

Research studies made in Subarea 3 were reported by Canada, France, Germany, Japan, Poland, Portugal, Spain, USSR, UK and USA.

Hydrography

Hydrographic studies were made by Canada, France, USA and the USSR. The report of the Environmental Subcommittee contains the following summary of conditions in Subarea 3 in 1970:

"Off Labrador and eastern Newfoundland (Subareas 2 and 3) in July and August core temperatures in the colder shoreward part of the Labrador Current were generally below average, but in the deeper water of the continental slope, in the outer West Greenland Current contribution to the Labrador Current, both temperatures and salinities were often similar to or higher than the highest previously recorded".

A USSR study reports intensification of the cold Labrador Current which caused a cooling of the eastern slope of the Grand Bank, and there was a similar intensification of the Gulf Stream which warmed the western part of the Bank (Res.Doc. 71/91). Seasonal and year-to-year variability of water temperature in the areas of Labrador and Newfoundland for the years 1936, 1938-1941 and 1948-1970 was analysed in the USSR Res. Doc. 71/96. There was an intensification of hydrographic work in 1970 by the St. Johns, Newfoundland Laboratory (Res.Doc. 71/22). New hydrographic studies in the Laurentian Channel and adjacent areas were initiated by France (Res.Doc. 71/46 and 71/82).

Plankton

Plankton studies were reported by France and the United Kingdom. During a French research cruise in the spring of 1970 vertical plankton hauls were made at 13 stations along the Laurentian Channel and the adjacent banks. Figures are given for plankton volume and abundance of fish eggs and larvae. This is the first stage

of a continuing programme (Res.Doc. 71/82). The Plankton Recorder Survey was continued by the United Kingdom and a total of 16,915 miles was sampled in Subarea 3. The spring outbreak of plankton was below average in the oceanic region of Subarea 3 but diatoms were abundant over the Grand Bank in April and May. Numbers of copepods were above the long term mean (1962-69) during the first half of the year in both oceanic and coastal parts of Subarea 3 and below average from July to November (Res.Doc. 71/54).

Special Biological Studies

Special biological studies of the roundnose grenadier (Macrurus rupestris) were reported by the USSR (Res.Docs. 71/89 and 71/93). These covered feeding and migration of the Northwest Atlantic and studies of age and growth. It is concluded that the fish has a long life and many age groups in the population. The spawning area of this fish has not been located but there seems to be some possibility of a connection between the stocks in the Northwest Atlantic and those at Iceland.

A Soviet survey of the distribution of haddock spawning grounds in the ICNAF area includes information relating to Subarea 3 (Res.Doc. 71/42). The relation between wind strength and direction and drift and survival of haddock eggs and larvae is considered.

A detailed study of redfish taken from the north side of the Laurentian Channel (Divs. 3Ps & 3Pn) was reported by France (Res.Doc. 71/83). Other biological information on redfish in Subarea 3 is included in the Soviet Res. Doc. 71/53.

Res.Doc. 71/6 reports on the incidence of the larval nematode Anisakis sp. in herring from Canadian Atlantic waters. It is concluded that the level of infestation is very low compared with, say, the North Sea, and does not present a problem in the utilization of herring for human consumption if reasonable standards of processing are observed.

France reports the results of surveys made during the period 1966-70 for shrimp (Pandalus borealis) in the channels among the banks in Subareas 1 - 5. In Subarea 3 ten hauls made in the Burgeo trench in May 1970 yielded an average of 42 kg. per hour's fishing; there were substantial by-catches of redfish and witch.

Tagging

The USSR marked yellowtail flounder, American plaice and cod (with a few haddock, witch,Greenland halibut and dogfish) in Subarea 3, mainly in Div. 3L (Res.Doc. 71/53). Greenland halibut tagged by Canada off White Bay, Newfoundland

in the winter of 1969/70 gave 20 recoveries during the first year, of which 5 were taken in the spring northeast of Funk Island. This suggests that the Greenland halibut fished offshore in Divs. 3K and 3L and those caught in the deep coastal bays of Newfoundland may belong to the same stock which migrates to the continental slope for spawning (Res.Doc. 71/119).

Canada marked herring with internal tags to establish the relationship between the stocks fished from spring to autumn in the southern Gulf of St. Lawrence and those exploited in winter in Div. 3P (Res.Doc. 71/108).

Groundfish Surveys

The Report of the Working Group on Coordinated Groundfish Surveys (Res. Doc. 71/32) indicates that Canada (Nfld.), USSR (PINRO), Poland and France (St. Pierre) may undertake surveys in Subarea 3 during 1972. For further details reference should be made to the appropriate section of the R. & S. Committee's Report. Canadian methods of groundfish survey are described in Res.Doc. 71/36 and a suggested plan for stratified sampling has been presented as a separate annex. The accuracy of abundance indices for cod assessed by a comparison of research vessel surveys and information from commercial catches is presented in Res. Doc. 71/38.

Other Research

Canada provided technical details and towing characteristics of 6 main types of otter trawls used for groundfish in the Northwest Atlantic (Res.Doc. 71/39).