



Serial No. 2863  
(D.b.71)

ICNAF Res.Doc. 72/132

ANNUAL MEETING - JUNE 1972

Status of Fisheries and Research  
Carried out in Subarea 1, 1971

by

Sv. Aa. Horsted

1. Pertinent Documents

This summary is based upon Research Reports by the following Member Countries (1972 Res. Doc. number in brackets):

Canada (36), Denmark (34), Fed. Rep. Germany (44), Iceland (35), Japan (41), Poland (43), Portugal (40), Spain (39), UK (37), USA (45) and USSR (42). Also Res. Docs. 72/19 and 72/91 contain information on research carried out in the Subarea in 1971.

Other pertinent documents for this summary are:

- Res. Doc. 72/32 (Report of the Joint ICES/ICNAF Working Party on North Atlantic Salmon)
- Res. Doc. 72/33 (Report of the Joint ICES/ICNAF Working Group on North Atlantic Cod Stocks)
- Res. Doc. 72/84 (Discards and Industrial Fish)
- Res. Doc. 72/124 (1971 Statistics)

Work on salmon and seals is not considered in this summary, and documents containing information on salmon or seals solely are, therefore, not listed here.

2. Status of the Fisheries

A. Subarea 1

Table 1 gives the nominal catches by species or group of species for the last four years and for the peak year 1962. Table 2 shows for the same years total catches and catches of cod by countries.

Table 1. Nominal catches from Subarea 1 (thousands of metric tons) by principal species (excl. mammals). Figures from ICNAF Statistical Bulletin.

Species/Year	1962	1968	1969 <sup>1</sup>	1970	1971 <sup>2</sup>
All species	528	408	225	146	148
Cod	451	382	205	116	119
Redfish	61	9	4	4	3
Grenadiers	-	∅	∅	6	4
Flounders and other groundfish	14	10	6	5	5
Salmon	∅	1	2	2	3
Prawns	3	6	7	9	10
Other species	∅	∅	1	4	3

<sup>1</sup> Catches by Non-members are not allocated to subareas and are not included. Their total catch of cod in the Convention Area was 55 thousand tons.

<sup>2</sup> Figures include the following estimates: Denmark (F) 15,000 tons cod out of a known total of 16,750 tons. Norway + Denmark (F) 1,000 tons of prawns.

Table 2. Nominal catches from Subarea 1 (thousands of metric tons) by countries. Only countries with more than 500 tons total catch are shown separately. Figures from ICNAF Statistical Bulletin.

Country/Year	All species (excl. Mammals)					COD				
	1962	1968	1969	1970	1971	1962	1968	1969	1970	1971
Denmark (F)	93	46	19	8	17	93	46	18	8	15 <sup>1</sup>
Denmark (G)	41	33	38	37	38 <sup>2</sup>	35	21	24	20	20 <sup>2</sup>
France	53	47	25	5	4	53	47	25	5	4
Germany (F.R.)	192	145	83	45	43	125	133	79	41	41
Iceland	6	∅	∅	-	-	1	∅	∅	-	-
Norway	32	40	19	7	7	32	39	18	6	5
Poland	1	1	∅	-	-	∅	1	∅	-	-
Portugal	92	33	16	9	6	92	33	16	9	6
Spain	3	22	24	19	22	3	22	24	19	22
USSR	-	2	∅	8	5	-	2	∅	1	∅
UK	17	10	1	4	3	16	10	1	3	2
Non-members	-	29	NK	5	3	-	28	NK	5	3
TOTAL	528	408	225+	146	148	451	382	205+	116	119

<sup>1</sup> Estimated

<sup>2</sup> Provisional

Total nominal catch in 1971 was just above that in 1970, and the catches in these two years are the lowest recorded in ICNAF's statistics. The 1971 catch is only about one-quarter of the catch in the peak year 1962.

The drastic decline in total catch in the last four years falls nearly entirely on cod, but over the last decade also catches of redfish have declined from a level constituting about 12% of catches in 1962 to an insignificant catch of about 2% of the present low total catch.

Catches of other species have remained more constant and for the economically important species salmon and prawns there has been a rather steady increase in catches. After cod, prawns now account for the highest quantities landed from the Subarea.

As shown in Table 2, the changes in catches have varied greatly between countries. The relatively most abrupt decline in catches is found for Denmark (F) although with some improvement in 1971, France and Portugal, and in the last few years also the Norwegian catches have dropped abruptly. Denmark (G) has maintained its total catch by increasing catches of species other than cod and has avoided a more drastic decline in cod catches only by introducing large stern trawlers. Spanish catches have remained rather stable, probably due to a switch of effort from other trawlers to pair trawlers. German catches have declined seriously in the mid sixties especially so far as redfish is concerned, in the last years also for cod, although an important German cod fishery on the same cod stock is taking place off East Greenland as shown in Table 3. Germany has maintained a high catch per day but only by limiting effort to fish on concentrations of cod around the spawning season, especially off South Greenland.

The overall decline in catches in the last three years is to a great extent due to reduced activity following adverse conditions for fishing, especially bad ice conditions. However, also the present low level of the cod stock has made vessels less interested in fishing in the area. In this connection it should be pointed out that the reduced activity has not been followed by a proportional decline in fishing mortality. The Assessments Subcommittee reports that fishing mortality for fully recruited age-groups has been maintained at a level near  $F_{max}$ . Taking this into account and considering the relatively poor prospects for recruitment in the near future, the best estimate of catches in 1972-73 is not much more than 100,000 tons. Present year-class strength of commercial-sized fish and of pre-recruits indicate the possibility that by 1973, cod may be more evenly distributed in the Subarea than at present.

B. East Greenland

Cod in Divs. 1E-1F and off Southeast Greenland seems to be a unit stock and fishing off East Greenland should be taken into consideration when assessing exploitation of Subarea 1 cod. The catches from East Greenland waters are given in Table 3.

Table 3. Nominal catches from East Greenland (thousand metric tons). Figures from 1971 Meeting Proceedings No. 2 and from Res. Doc. 72/44.

	Total				Cod				Redfish			
	1968	1969	1970	1971	1968	1969	1970	1971	1968	1969	1970	1971
Germany (F.R.)	26	41	31	44	10	14	14	29	15	25	16	14
Iceland	13	9	7		7	4	5		6	4	1	
Other nations	1	1	1	1	1	1	1	1	Ø	Ø	Ø	Ø
TOTAL	40	51	39	45+	18	19	20	30+	21	29	17	14+

Cod has now become the most important species in the fisheries off East Greenland. The German cod catches are nearly as large as in 1964 when German trawlers had their hitherto highest catch in this area (29,400 tons). Catch per day in the German fishery was the highest so far recorded (25.4 tons total, 16.5 tons cod), for cod about a doubling of former level of catch per day.

3. Research Work

Research work in Subarea 1 in 1971 is reported by Canada, Denmark, Fed. Rep. Germany, Portugal, UK and USSR. Also Res. Doc. 72/91 reports work carried out in the Subarea.

A. Hydrography

(Canada, Denmark, Fed. Rep. Germany, USSR and Res. Doc. 72/91)

Hydrographic studies have been made in all divisions but with the best coverage in Div. 1D.

In 1971 as in the two preceding years, the ice situation was extremely severe. During its maximum extension in July the "storis" reached from Cape Farewell to lat. 64°N (Fyllas Bank) and extended westward off Frederikshaab to a distance of 120 nautical miles from the coast line. Although ice conditions were more normal from August on, it should be mentioned that air temperatures in periods of the 1971/72 winter have been extremely low causing great difficulties for sailing and for fishing operations. Ice was formed on many of the fishing banks. Germany reports that in December a new progression of polar ice was observed in the Cape Farewell region. Div. 1A and northern part of Div. 1B have been completely closed by winter ice during the whole winter of 1971/72.

Water temperatures in the first five months of the year (observations on sections in Div. 1C and 1D) were very cold, below 0°C, in the upper 100 m as a result of strong winter cooling and inflow of cold water from the East Greenland Polar Current. In June temperatures over the lower part of Fyllas Bank were still below 1°C and even below 0°C west of the bank. This sub-zero water mass was still observed in July although further westwards. From August to December, water temperatures over Fyllas Bank were generally between 1° and 2°C, and the summer heating caused relatively high surface temperatures over the northern banks, higher than over Fyllas Bank. In November-December severe winter cooling took place leading again to sub-zero temperatures in upper water layers over all the West Greenland fishing banks.

Comparison of 1971 temperatures and salinities with values in 1963 (Germany) and with mean values for 1950-66 (Denmark) clearly shows that water temperatures and salinities have decreased in recent years indicating strong inflow of polar water to West Greenland. The cooling seems to be most pronounced in water layers between 50 and 300 m, in July and for the area just west of Fyllas Bank between 1° and 1.5°C lower than the mean of 1950-66. The corresponding salinity anomalies were found to be about -0.5‰.

#### B. Bathymetry and Geophysics

(Canada)

Surveys were undertaken for the general bathymetric chart of the ocean program and in support of the geophysical studies.

#### C. Plankton

(Denmark, UK)

The surveys with the Continuous Plankton Recorder operated by the Oceanographic Laboratory in Edinburgh covered 1,092 miles in Subarea 1.

Denmark continued the long series of plankton samples taken with 2 m stramin net. The results indicate that plankton abundance, especially numbers of crustaceans, has been very low the last few years (Res. Doc. 72/38, Table 2). This corresponds to the colder surface temperatures in most recent years.

#### D) Cod. (Denmark, Fed. Rep. Germany, Portugal and Res. Doc. 72/91)

##### 1. Eggs and Larvae (Denmark)

Eggs and larvae were sampled on the Fyllas Bank Section (Div. 1D) in May, June and July and on sections in Div. 1C and 1B in July. Some spawning seems to have taken place over the western part of Fyllas Bank

and German trawlers exploited spawning concentrations to the West of Banana Bank. Numbers of larvae caught north of Fyllas Bank are the lowest so far recorded. The 1971 cod year-class of West Greenland origin is, therefore, at present regarded as being very poor.

2) Young Fish (Age-Groups I, II and III) (Denmark)

Hauls with fine meshed otter trawls on standard stations in Divs. 1C and 1D show that the 1968 year-class is the most promising of those that will recruit to the fishery up to about 1975. The 1968 year-class seems to be most abundant in Divs. 1B-1D but does also occur in Div. 1E (see also Section 3). It may be comparable to the 1966 year-class, which can be regarded as a relatively good, although not a strong one. The 1968 year-class will no doubt be predominating in catches in Divs. 1B-1D and probably 1E in 1973-75.

3) Composition of Commercial Catches (Denmark, Fed. Rep. Germany, Portugal, Res. Doc. 72/91)

According to Res. Doc. 72/84, very few discards occurred in the 1970 fisheries (rate less than 2%), and discarding in 1971 is probably at the same low level.

Age-composition of landings as reported by Denmark and Fed. Rep. Germany shows a general trend in year-class distribution off West Greenland. In the northern Divs. 1B and 1C the 1965 and 1966 year-classes constitute nearly the whole part of most landings. Spawning concentrations fished by Germany in great depths west of Banana Bank (Div. 1C) were composed mainly of the 1965 year-class but with considerable amounts also of year-classes 1961, 1966 and partly 1960.

Inshore catches in the northern divisions taken mainly by fine meshed pound nets contain considerable numbers also of year-class 1967.

For catches taken at the end of the year, Ernst and Zukowski (Res. Doc. 72/91) found the 1965 and 1966 year-classes to be the most abundant in Div. 1B, whereas in Div. 1C the 1966 and 1967 year-classes predominated.

The 1962, 1963 and 1964 year-classes are nearly missing in Divs. 1B-1C.

Also in Div. 1D, Danish and German samples show that the 1965 and 1966 year-classes are of great importance but here they are mixed up with year-classes 1963 (especially) and 1964, the former of these extending also up in southern part of Div. 1C (Banana Bank) in June in its post-spawning northward migration.

The further south the more the 1963 year-class dominates. In Div. 1F it is by far the most important followed by year-class 1964. These two year-classes seem to constitute nearly the whole catch off southernmost Greenland. The 1965 and 1966 year-classes dominating in the northern divisions are nearly missing in Div. 1F.

For Divs. 1D and 1E, Ernst and Zukowski found the 1964 and 1965 year-classes to be the most abundant.

At the end of the year, German research catches in Div. 1D and off Cape Thorvaldsen (boundary between Divs. 1E and 1F) showed the promising 1968 year-class to occur also here being the most abundant year-class in the samples from Div. 1D.

Length composition of Portuguese trawler landings generally seems to be in agreement with Danish and German samples.

Broadly speaking, it could thus be said that catches in Divs. 1B-1C as well as in Divs. 1E-1F are based on two year-classes only but with two years older cod in the two southern divisions, whereas the catches in Div. 1D seem to be mixed of all four year-classes.

In spite of the difference in age-composition between north and south there is not a corresponding difference in mean weight of cod. Growth rate for cod in southern areas seems to have decreased in most recent years.

#### 4) Tagging (Denmark)

A total number of 2,322 cod were tagged, mainly in Div. 1D inshore.

The ICES North Western Working Group and the Joint ICES/ICNAF Working Group on Cod Stocks in the North Atlantic have tried to assess the spawning migration of cod from West Greenland to East Greenland - Iceland partly on the basis of tag-recapture data. The migration of mature cod from Divs. 1E-1F and East Greenland to Iceland was found to fluctuate between years and year-classes, but generally speaking, the migration seems to be of the order of 25% per year. For further information see Res. Doc. 72/33, p. 12-13).

#### 5) Other Work on Cod

A small-scaled exchange of otoliths from 1971 samples between Denmark and Fed. Rep. Germany showed a nearly complete agreement in ageing of cod between readers in the two laboratories.

Ernst and Zukowski (l.c.) report on cod feeding patterns in Subarea 1 in December. In Div. 1D, small fish predominated. Near Great Halibut Bank (Div. 1B)

deep sea prawn was common food, whereas brittle stars were important in Div. 1C and 1E south.

E. Grenadiers

(USSR)

In August and October, a series of trawl hauls were made in depths of 600-800 m along the Greenland-Canada ridge, mainly in western part of Div. 1C. Roundnose grenadier prevailed in the catches south of the ridge. Most fish measured 55-65 cm, males being the smallest and most abundant. No grenadiers were recorded north of the ridge where the temperatures (below 1°C) may be too low for this species. Greatest abundance were found in water masses with temperatures between 3° and 4°C.

F. Greenland Halibut

(Denmark, USSR)

The USSR sampled Greenland halibut both north and south of the Greenland-Canada ridge in June. In August 424 specimens were tagged in Div. 1B.

Denmark tagged 51 specimens in Div. 1D. Nursery grounds were found off Umanak Fjord (Div. 1A) at a depth of 500-600 m.

G. American Plaice

(Denmark)

395 specimens were tagged in Div. 1D. Material for ageing was collected.

H. Pelagic Fish

(Denmark)

Samples of capelin by a fine meshed pelagic trawl were taken in Div. 1D inshore.

The distribution of larvae of sand eel has been studied and is shown in Res. Doc. 72/38, Fig. 5. In a dredge sample of bottom material in July west of Great Halibut Bank, depth 740 m, several partly decomposed sand eels were found. This may indicate a mass death of sand eels as is the case with capelin in coastal waters.

I. Atlantic Salmon

(Canada, Denmark, UK)

All work on salmon has been reported to the Joint ICES/ICNAF Working Party on North Atlantic Salmon. The report of the last meeting of the Working Party is Res. Doc. 72/32.

Studies in Greenland fresh water systems aiming at elucidating the possibility of planting salmon in Greenland rivers were carried out in Div. 1C-1D and it is planned to continue them in Divs. 1E and 1F in 1972.



J. Crustaceans

(Denmark)

Further investigations on prawn stocks were undertaken especially in Div. 1A at Umanak Fjord, in Div. 1B west of Great Halibut Bank and in Div. 1E.

Small scaled trap-fishing experiments for Chionoecetes were conducted in coastal waters near Godthaab.

K. Seals

(Denmark)

Research on seals in Subarea 1 is reported to Panel A Advisers in Res. Doc. 72/85.

