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Danish Research Report, 1972

Part I. Subarea 1

by

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A. STATUS OF THE FISHERIES

1. General trends

The nominal catches taken by Denmark (Greenland) in 1972 are given in the following table (provisional data)

Species	Nominal catch (metric tons)	Increase or decrease from 1971 (%)
Cod	23 778 a)	+ 19
Redfish	247	- 24
Wolffish	3 323	+ 27
Greenland halibut	3 021 b)	+ 161
Halibut	14	+ 250
Capelin	1 916	- 22
Atlantic salmon	1 306	- 10
Arctic char	97	- 22
Lumpsucker roe (not converted to round, fresh fish)	124	- 49
Industrial fish	160	- 11
Other fish	0	0
Prawns (Pandalus borealis)	7 502	- 16
Total (excl.lumpsucker roe)	41 364	+ 12

a) Some few hundred tons caught by trawlers off SE Greenland are included together with 264 tons caught by small boats off Angmagssalik, East Greenland.

b) Approximately 500 tons caught outside the ICNAF Area (W of Div. 1D) are included.

Besides the catches by Denmark (G) the following Danish catches are reported from Subarea 1.

The Faroes : Cod app. 8000, salmon 155, prawns supposedly 100-200 tons.

Denmark, mainland : Greenland halibut 20, salmon 401, prawns 115 tons.

The three most important species (in terms of income) for the Greenland fishermen in 1972 were salmon (36%), cod (33%) and prawns (23%). While prawns were more important than cod in 1970 and 1971 (prawns 33%, cod about 25%) cod has in 1972 again superseded prawns while salmon has maintained the head position since 1969. However, this relative importance is measured only by the direct payment to fishermen, whereas employment and earnings by the land based production has not been taken into account.

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Landings (in terms of weight) of the three major species showed a 19% increase for cod compared to 1971 while landings of prawns declined by 16% and those of salmon by 10%.

A considerable increase (161%) occurred in the fishery for Greenland halibut.

Further details on the major fisheries follow.

2. Cod.

a) The fisheries. Nominal catch was 19% above that of 1971 but is still considered to be at a very low level. The progress must be seen in the light of further increase in trawlers' effort (4 trawlers at the end of 1972, 3 at the end of 1971). The trawlers took 37% of the catch by Denmark (G) in 1972 (30% in 1971).

The fishery by small boats, mainly in inshore and coastal waters and mainly by pound net, increased by 7% from 1971 to 1972 but is at a level which is only about 40% of the 1962 level. The increase in 1972 is due mainly to good pound net catches at Holsteinsborg (Div. 1B) and Sukkertoppen (Div. 1C), presumably based on the 1968 year-class. In nearly all other districts of West Greenland the small boat fishery continued to decline.

In some periods, especially in the last half of the year, the trawlers have had difficulties in finding concentrations of cod worthwhile fishing. In some such periods the trawlers have instead fished for Greenland halibut in the western part of the Davis Strait.

By the end of March, 1973, catches are 14% less than catches by the same time of 1972. The trawlers account for 98% of this catch small boat fishery being at the usual very low level in winter time.

b) Forecast for 1973-74. The fleet of Greenland trawlers will be increased by 3 stern trawlers (501-900 tonnage class) in 1973/74, but further increase of the fleet is not planned at present.

Apart from year-class 1968 the West Greenland cod stock has produced only very small year classes since 1964 and will, therefore, be at very low level in the mid 1970'ies. If the trawlers are fishing at West Greenland only their increased number may bring some increase in their total catch from Subarea 1. If in periods when cod fishing off West Greenland proves too bad the trawlers choose to operate in other areas, e.g. off SE Greenland and/or fish for other species, e.g. Greenland halibut, their total catch may well increase further. Their possibilities for such other fisheries are, however, very limited due to the fact that they are not factory trawlers but trawlers due to supply fishing industries at West Greenland with iced fish.

The small boat fishery in coastal and inshore waters can hardly expect any improvement, except that in 1973 the 1968 year-class may lead to good pound net catches in Div. 1B-1C especially.

The international fishing activity at West Greenland is very dependent on the prospects there seen in relation to prospects in other areas. However, the West Greenland cod stock is now at a very low level which by itself indicates that the total international catch in 1973/74 will be very low, probably comparable to the low 1971/72 level. The main part of the catches is

still expected to be taken by trawlers in the first half of the year, especially when year-class 1968 starts maturation (mainly in 1974) and is expected to form spawning concentrations on the western slopes of the SW Greenland banks.

3. Atlantic salmon.

The total international catch of salmon off West Greenland decreased from approximately 2700 tons in 1971 to little more than 2000 tons in 1972. Regulations to limit catch were in force in 1972, but great variations in catch rate with very poor catches in the last half of the season for the offshore fishery lead to a greater overall decline than dictated by the regulations. The coastal fishery seems to have been more stable than the offshore fishery.

The reason for these variations in the fishery are not known, but a detailed analysis of environmental factors, especially water temperature, will be made since some observations indicate abrupt changes in surface temperature to have caused the fluctuations in the fishery.

For further details of the 1972 salmon fishery see Report of the ICES/ ICNAF Joint Working Party on North Atlantic Salmon, Copenhagen, 19-23 March, 1973 (ICNAF Summ.Doc. 73/7).

No forecast for the 1973-74 fisheries at Greenland based on stock analysis can be given, but as permissible catches by the offshore fishery are declining through 1973-76 it seems likely that the catches will be determined by the regulations more than by fluctuations in stocks and catchability.

4. Other fish.

The most pronounced change has taken place in the fishery for Greenland halibut of which a total amount of 3021 tons was caught. Part of the catch is taken as by-catch in trawl fisheries for cod and for prawns, but a direct inshore fishery by long-lines also takes place. However, the progress in 1972 is due mainly to a trawl fishery directed towards Greenland halibut. This fishery has taken place at periods when trawlers have had difficulties in finding concentrations of cod, and the fishery has taken place at the western part of the Davis Strait.

5. Deep sea prawn.

The steady increase which the fishery on Pandalus has shown for about ten years was discontinued in 1972 when catches dropped by 16% from the 1971 level. The decline seems to have been connected with a decrease in effort in the most important area (Disko Bay) but also ice and weather conditions are said to have been less favourable than in 1971.

B. SPECIAL RESEARCH STUDIES

1. Environmental studies.

a) Hydrography. A detailed description of the hydrographic conditions in Subarea 1 in 1972 is given by Hermann and Lenz in Research Paper to the 1973 Annual Meeting of ICNAF. Their paper can be considered part of the Danish as well as the German Research Report, 1972. The following observations on water temperatures are taken from their paper (ICNAF Res.Doc. 73/53):

Very cold conditions were found on the Fylla Bank section (Div.1D) in the upper 100 metres in April, June and July indicating that the 1972 cod year class will probably be poor.

Surface temperatures in the West and South Greenland area are now back at the level of the mean value for the years 1876-1915, and the climatic jump back to cold conditions has been just as sudden as the rise in temperatures in the twenties.

b) Plankton. Oblique hauls with 2 m stramin net (225 m wire) were taken at some of the standard hydrographic sections in the Davis Strait in April-July. The Danish Research Report, 1971 indicated that plankton catches (displacement volume) had been relatively poor in the last three years (1969-1971). The volume of plankton on the Fylla Bank section (Div.1D) in July 1972 was even less, in average only 74 ml against 209 ml in 1971, which was the lowest in the 1961-1971 period.

c) Ice situation. Following Recommendation 20 ii) of STACRES, 1972 that national research reports should contain a section on ice conditions, particularly the concentration and extent of ice cover in the various subareas a special section on the ice situation in Subarea 1 in 1972 has been prepared, see Danish Research Report, 1972, Part II by Hans Valeur.

2. Biological studies.

a)Cod. Eggs and larvae. In the spawning season (April-June) plankton samples were unfortunately taken only on the Fylla Bank section (Div.1D). Very few cod eggs were found but the material itself does not permit any judgement of the magnitude and distribution of spawning cod.

Observations on cod larvae in the plankton were made in June and July. The Fylla Bank section (Div.1D) was surveyed in June as well as July, but no cod larvae at all were observed. The section off Sukkertoppen (Div.1C) and off Holsteinsborg (Div.1B) were surveyed only in July. The number of cod larvae found is given in Fig.1. Cod larvae seem just as scarce as in 1971 but have a tendency to a more northernly distribution than in 1971. The number of larvae together with the hydrographic informations indicate that the 1972 cod year class at West Greenland is poor.

Occurrence of pre-recruit cod (age-groups I, II, and III) has been studied only to a very limited extent in 1972, and no new information has been gained to change previous estimates that the 1969-71 year-classes are poor.

Age and size distribution of cod in landings. The most important material has been collected from trawlers' landings.

In 1971 there was a pronounced difference in age composition between landings from areas north of Godthåb (Div.1D) and landings south of Godthåb. The 1965 and 1966 year-classes were predominating to the north (Divs.1B-1C) while the 1963 and 1964 year-classes were predominating in Divs.1E-1F. In Div.1D the four year classes were more evenly mixed.

Samples from 1972 (Fig.2) indicate that as in 1971 the 1963 and 1964 year-classes are nearly absent in Divs. 1B-1C. However, the 1965 and 1966 year-classes seem to be more evenly distributed along the coast than in 1971.

Year-class 1967 which in 1971 was rather pronounced in samples from coastal waters now consist of individuals which are retained by trawls, and the year class is rather well represented (relatively!) in most samples.

The 1968 year-class gradually recruited to the fishery in 1972 and by the end of the year this year class seems to be the most abundant in trawlers' catches (samples 11+12+16). It also seems to have been predominating in inshore pound net catches in all divisions, but most individuals at this time of the year (May-August) seem to have been discarded and are, therefore, not represented in the samples taken from landings (a local Greenland regulation forbids landing of cod less than 42 cm total length). Without doubt the 1968 year-class will be the predominating one in 1973-74, but as the following year-classes are regarded poor the stock as a whole will be at a very low level the next four years at least.

The difference in growth rate between cod from northern and cod from southern divisions of Subarea 1 reported in 1971 is also evident in the 1972 samples. For cod in the southern divisions (Divs.1E-1F) there seems to have been a decline in growth rate the last few years. It is hoped to produce a special research document on this question for presentation at the 1973 Annual Meeting of ICNAF.

Tagging experiments. 930 cod were tagged in 1972. Of these 605 were small cod (less than 50 cm total length) caught and released mainly in inshore waters of Div. 1D.

b) Atlantic salmon. A major part of the Danish research activity in 1972 was devoted to participation in the ICES/ICNAF International Salmon Tagging Experiment at West Greenland. Denmark participated with the R/V ADOLF JENSEN from 2 August to 15 October and with observers on 6 commercial vessels (3 Danish, 3 Faroese) throughout most of the season. Also the research cutter TORNAQ in shorter periods took part in the experiment. For further details see Report of the ICES/ICNAF Joint Working Party on North Atlantic Salmon, Copenhagen, 19-23 March, 1973 (ICNAF Summ.Doc. 73/7).

A two years survey of Greenland fresh water systems aimed at elucidating the possibilities of planting salmon in Greenland rivers have been completed. 78 major rivers and river systems between Kap Farvel and Holsteinsborg have been investigated. Unfortunately it seems clear that the possibilities of introducing salmon in rivers other than the only one in which it is already found are extremely limited. Lack of suitable spawning areas and very limited time with sufficiently high water temperatures are the main hindrances.

c) Other fish. Lengths, weights and otoliths have been collected from American plaice and Greenland halibut. 261 American plaice were tagged.

d) Crustaceans. Continuous research catches of deep sea prawn (Pandalus borealis) were taken on various grounds especially in Divs.1C and 1D, and trap fishing experiments for the crab Chionocetes opilio have been conducted in inshore waters of Div. 1D. These experiments will be continued and extended in 1973.

e) Seals. Sampling of material for age determination of hooded seal, harp seal and ringed seal has been continued in 1972 to the same extent as in 1971. The northern districts Umanak and Upernavik were visited in June and July. Sampling of the three species mentioned above is now organised in the most important districts. The material collected in 1971 and 1972 is worked up, see Res.Doc./73/54 by F. Kapel for the 1973 Annual Meeting of ICNAF.

3. Gear and selectivity studies.

Material for studies of mesh size selectivity in salmon drift nets has been collected during the International Salmon Tagging Experiment.

Experimental fishing with various types of traps for crabs (Chionocetes opilio) has been conducted. A special type of trap has now been selected for further experimental fishing.

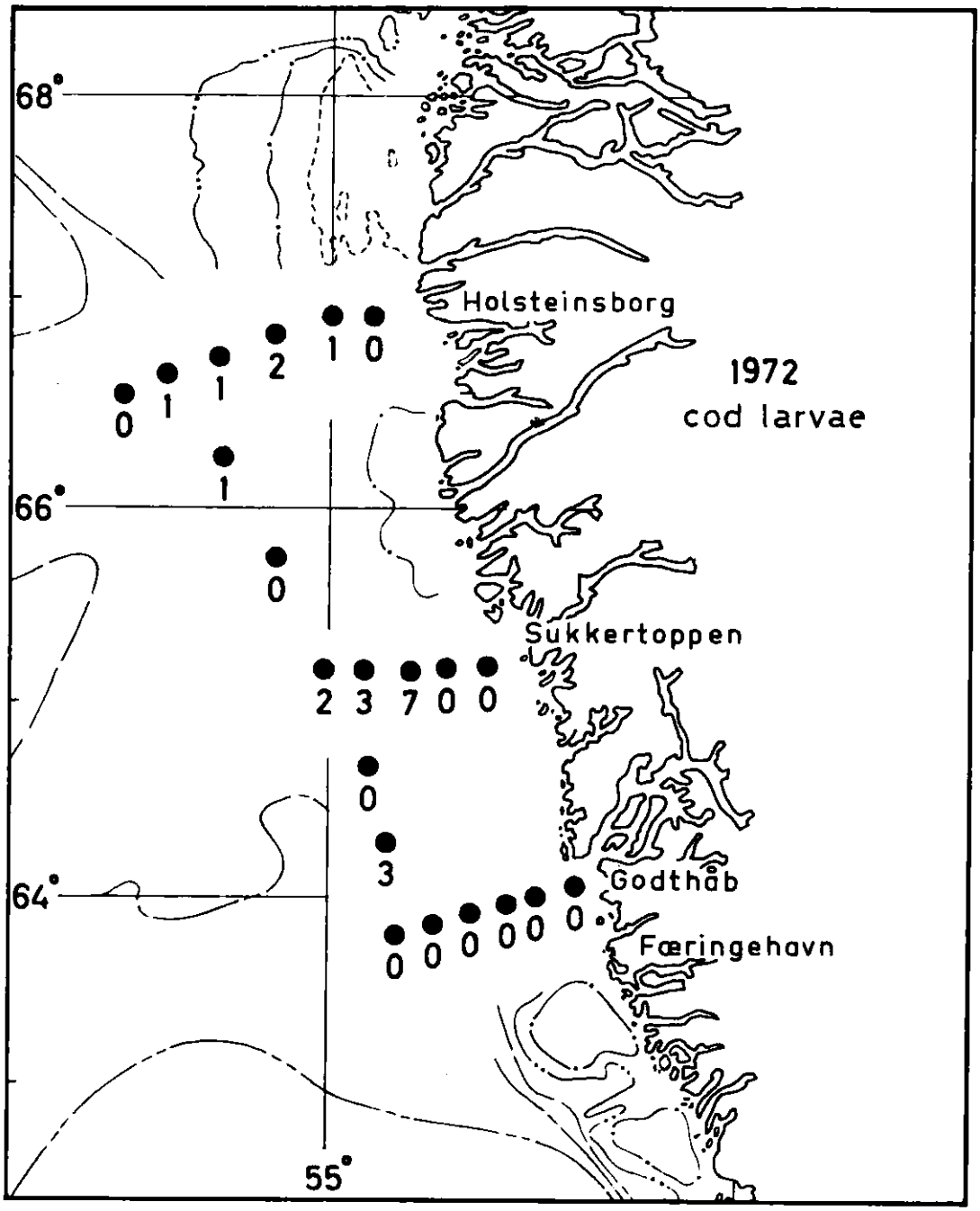

Fig 1. Cod larvae (number per 30 min.) taken by 2 m stramin net in the upper water layers (maximum depth about 50 m). July 1973.

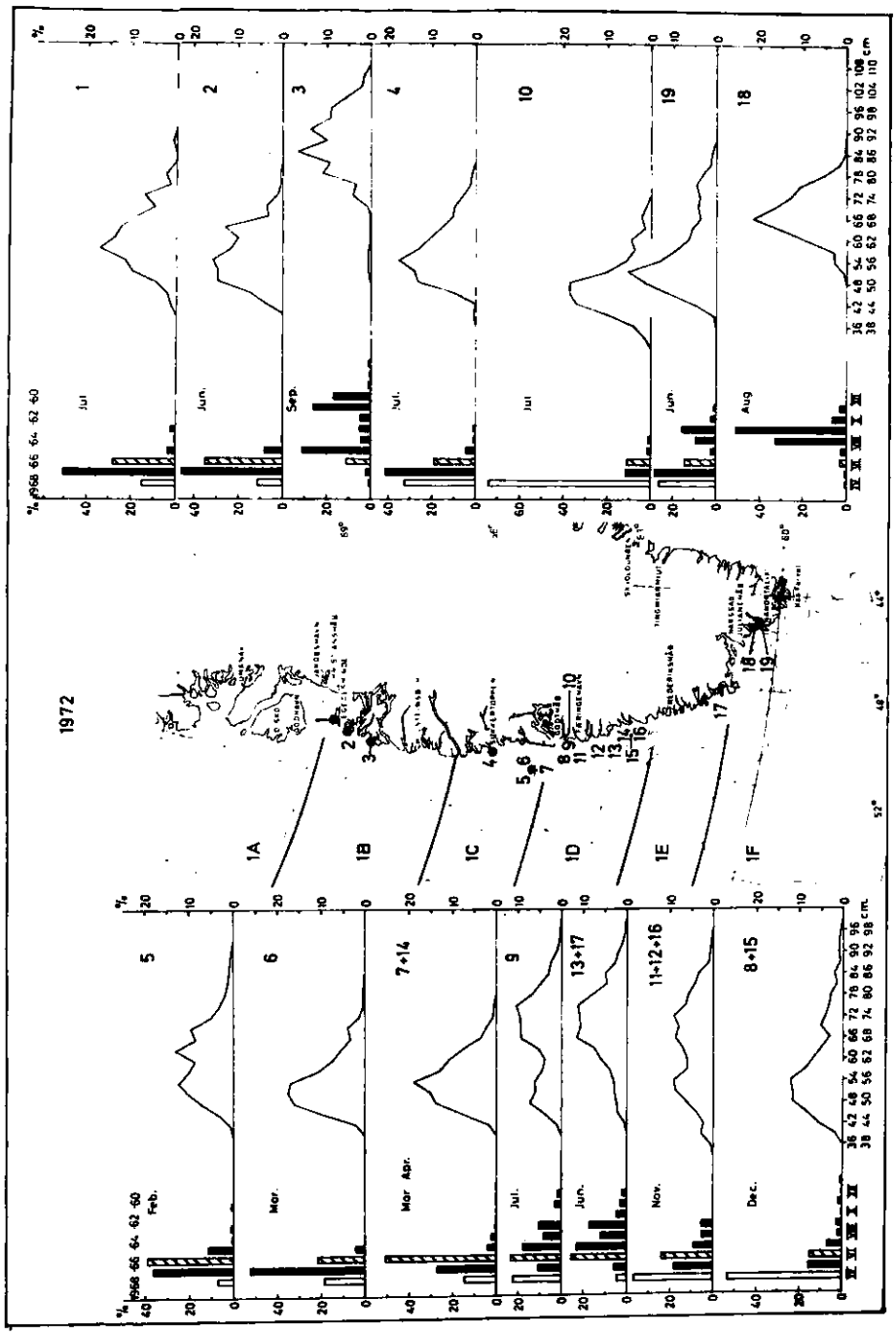

Fig. 2. Age and length composition of cod from commercial landings. All samples at the left hand side are from offshore waters by otter trawlers while those at the right hand side are from inshore waters and by pound net except for sample No.3 where gear is unknown but could be long-line. Samples numbered by more than one figure, e.g. 7+14 are not combined of two or more individual samples but the figures indicate, that the landing (of which a single sample was taken) was obtained by fishing more than one locality on the same trip.

Danish Research Report, 1972

Part II. Ice Conditions off the Greenland Westcoast South of 70°N, Season 1972

by

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General.

The occurrences of polar ice (storis) were much more sparse than during the preceeding three severe iceseasons. However, the local formation of coastal ice was favoured by cold calm weather, particularly in southern Greenland, where the thickness of the fast ice in Tunugdliarfiq Fjord reached the very unsusual thickness of 120 cm in March, and at Egedesminde in Disko Bugt, where three ships were bound from ab. 15th December 1971 till 26th April 1972. Tunugdliarfiq began to freeze up again in November and the ice reached 60 cm thickness at the end of December.

Polar ice

The polar ice passed Cape Farewell at the end of January. During February and first half of March moderate quantities were present in Julianehåb Bugt. During the latter half of March the polar ice was absent, but reappeared at the beginning of April and culminated around the 25th when it reached a position off Ravns Storø, about 62°35'N. At that date the width of the belt was ab. 50-80 nm, but with scattered concentrations. Shortly after the icebelt receded, yet with minor advandces in between. After 15th June only scattered patches were present and from 20th August all area to the west of Cape Farewell was ice free (except for bergs). The polar ice did not reappear in the area till around new year.

West ice

In January the west ice (Baffin Bay Ice) was laying close to the Greenland westcoast till a little north of Søndre Strømfjord. This position was nearly unchanged during the next two months. From 17th April the ice did not reach the coast south of 68°N any more, and between this lalitude and Egedesminde several shore polynyas occured in increasing amount. From 2nd May the coast was icefree till Egedesminde and from 18th May til Vajgat - apart from a tongue which around 24th May reached the coast off Holsteinsborg but disappeared a few days later. At the beginning of December the west ice edge was situated ab. 30 nm to the west of Disko increasing to ab. 60 nm west of Holsteinsborg these distances becoming zero towards the end of the year.