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GDR - Research Report, 1976

by

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In 1976 in the ICNAF-Subareas 0 - 6 the overall nominal catches of the GDR amounted to 67 188 tons which is by 45 927 less than in 1975. The decrease of the catches relates to the main species: Cod, Roundnosegrenadier, Herring and Mackerel.

Table 1: Species composition of GDR in the Subareas 0 - 6

	<u>1976</u>	<u>1975</u>
Capelin	-	7
Alewife	1260	2121
Greenland halibut	1672	2081
Witch	110	374
Am. plaice	23	20
Flatfishes n.e.i.	-	23
Cod	11830	22540
Silver hake	1	37
Pollock	1747	279
Roundnose grenadier	678	2891
Wolffishes	-	5
Redfish	2473	2452
Bluefish	1	62
Butterfish	3	1
Herring	7891	30901
Mackerel	38150	48343
Horse mackerels, n.e.i.	-	1
Picked dogfish	12	62
Squid (Loligo)	317	620
Squid (Illex)	996	295
other finfishes	24	-
Total	67188	113115

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Subarea 0

A. Status of Fisheries

Commercial fisheries were not carried out.

B. Special Research Studies

No samplings or other studies were carried out in this Subarea during 1976

Subarea 1

A. Status of the Fisheries

Only a total catch of 341 tons, 160 tons Greenland halibut and 181 tons Roundnose grenadier were taken by commercial ships; 90 % of the catches were taken from the Division 1 C, the remainder from Division 1 B. The fishery was carried out by one "Zubringer-Trawler" and one factory-trawler in November and December (catch-deeps were between 600 and 900 meters). The catch per day amount to 9,8 tons in both months and was declined by 60 % in comparison with 1975. This decrease seems to be mainly caused by more unfavourable environmental conditions.

B. Special Research Studies

Samples of Greenland halibut and Roundnose grenadier were carried out by RV "Ernst Haeckel" in January (Div. 1 C) and by commercial vessels in November (Div. 1 C).

Table 2 Roundnose grenadier and Greenland halibut samples 1976, ICNAF 1 C

<u>Species</u>	<u>month</u>	<u>measured</u>	<u>Aged</u>
Roundnose grenadier	Jan.	113	20
	Nov.	1716	200
Greenland halibut	Jan.	403	234
	Nov.	951	-

Subarea 2 and 3

A. Status of the Fisheries

The nominal catches in the Subareas 2 and 3 amounted to 18.154 tons (1975 = 30.290 tons). Especially the decrease of the nominal catch relates to Cod (Table 3).

Table 3: Nominal catches (in 1 000 tons) in SA 2 and 3

	2 H	2 J	3 K	3 L	Total 1976	Total 1975
Cod	-	7,0	4,6	0,2	11,8	22,5
Redfish	0,3	1,1	0,3	0,8	2,5	2,5
Roundnose gren.	0,5	+	+	-	0,5	2,7
Greenland halib.	0,8	0,6	+	+	1,5	2,0
Flatfishes	-	0,1	+	-	0,1	0,4
others	-	0,8	0,9	+	1,7	0,2
Total	1,6	9,6	5,8	1,0	18,1	30,3

1. Cod

Fishing for Cod was carried out from middle of January and was ended in consequence of the ice condition at the end of February. In this short fishing-time were realized 65 % per cent of the nominal catch and 88 of Cod catch of this area.

The total effort of "Zubringer-trawler" (representative typ in this area) decreased by 30 per cent and also the catch per unit effort decreased by 27 per cent in comparison with 1975.

Table 4: Catch per hour of the "Zubringer-trawler" in SA 2 and 3

Year	Total	Cod	Redfish	Greenland halibut
1975	2,84	2,37	0,24	0,14
1976	2,13	1,52	0,28	0,07

Therefore, the decrease of the nominal catch of cod was attributed to the addition of lower catch per unit effort and lower total effort.

The decline of catch per effort was mainly founded by variations in the stock size, stronger as in 1975. The full exploitation of the year classes before 1970 and the absence of strong year classes after 1970 was expressed in the further reduction of the catches per unit effort in comparison with 1975.

The year-classes of 1969 and 1970 predominated with length-groups of 40 to 50 cm in the Division 3 K, and the year-classes of 1972 and 1973 predominated with length-groups of 24 to 32 cm in the Divisions 2 J and 3 L.

The exploitation of the younger year-classes and the relative lower signification of the older year-classes are characterized of the stretched situation of the cod-stock of this area.

2. Redfish

Redfish was caught in SA 3 L in March as independent redfish-fishery only.

In consequence of very good catches per effort the quota was realized quickly.

In November Refish was mainly taken as by-catch in the Roundnose grenadier fishery. The catches per effort were important lower in comparison with 1975.

3. Greenland halibut and Roundnose grenadier

Successful catches per effort were achieved in the Divisions 2 H, 2 J in the first days of June. After this time the results were lower and the fishery was characterized by instability. Also in July and August catches per effort were low, and therefore important lower in comparison with 1975. These fluctuations of fishery were possibly caused by unreal conditions of concentration which were based upon the abnormality in the hydrographic system of the area during this time.

The catch-per-hour in the directed grenadierfishery remained stable (table 5).

Table 5: Catch per hour in the directed roundnose grenadier fishery in SA 2

<u>Year</u>	<u>Total</u>	<u>R.grenadier</u>	<u>G.halibut</u>
1975	8,08	5,67	1,72
1976	1,12	0,26	0,56

B. Special Research Studies

1. Environmental studies

In Subareas 2 and 3 measurements of bottom and surface temperature and salinity on 37 stations were carried out.

2. Biological Studies

a) Cod

During the 41th cruise of RV "Ernst Haeckel" 41 trawling stations were carried out within the fishing area of our fleet in February 1976 only.

Samples are summarized in table 6

Table 6: Cod samples (specimens) 1976, ICNAF 2 J, 3K, 3 L

Area	Month	Mea- sured	Aged	Weighted
2 J	Feb.	3042	599	299
3 K	Feb.	10159	2389	2389
3 L	Feb.	193	74	74

In February in Division 2 J predominated the year classes of 1969 and 1970 with length-groups of 40 to 50 cm. Year-classes younger than 1970 showed a very strong abundance in Division 3 K in February. In Division 3 K as well as Division 3 L cod of 24 to 32 cm predominated, related to year-classes 1972 and 1973.

b) Redfish

3 923 measured specimens (Div. 3 K, 3 L), showed a length range of 22 - 39 cm (mean length 29,1 cm). The female-male-relation was 43 % : 57 %. Mean length of females changed between 28,9 cm (fishing deep 300-500 m) and 33,9 - 36,7 cm (fishing deep 500 - 1000 m), and also the mean length of males changed between 27,7 - 34,3 cm (fishing deep 300 - 500 m) and 33,6 - 38,4 cm (fishing deep 500 - 1000 m).

c) Roundnose grenadier

Samples of Roundnose grenadier were carried out by RV "Ernst Haeckel" in Division 3 K, 3 L in February as well as by commercial vessel in Divisions 2 H in October and November.

Table 7: Roundnose grenadier samples (specimens) 1976,
ICNAF 2 H, 3 K, 3 L

Area	Month	Measured	Aged	Research/Commercial
2 H	Oct.	6 851	524	com.
2 H	Nov.	2 589	-	com.
3 K	Feb.	801	292	res.
3 L	Feb.	300	103	res.

The main lengths of Roundnose grenadier ranged from 42 - 78 cm of Division 2 H in October and November which is related with the year classes from 1968 - 1958. The female-male-relation amounted to 54 % : 46 %. The mean length of males changed between 58,6 and 62,9 cm, and of females it changed between 58,2 and 61,6 cm.

In February the investigations showed a length distribution from 21 - 72 cm of males and females in the Division 3 K, 3 L. The mean length of males changed between 47,9 and 52,0 cm, and of females it changed between 49,6 and 52,5 cm. The female-male relation amounted to about 45 % : 55 %.

d) Greenland halibut

In February 735 Greenland halibut were measured in Division 2 H by research vessel. Scales and otoliths of 300 specimens were taken for age reading. The lengths of Greenland halibut ranged from 50 - 74 cm, which is related with the year-classes from 1956 to 1972.

Subarea 4

A. Status of the Fisheries

No commercial fishery in the Subarea by GDR.

B. Special Research Studies

1. Environmental Studies

Three hydrographic stations were worked.

2. Biological Studies

During participation in Joint-Herring-Programme in March three stations in Div. 4 X were fished by RV "Ernst Haeckel". At the most successful one (18 kg total catch) mainly herring (60 %) and juvenile cod were caught. The herring were measured (77 specimens) and aged (50 specimens). The 1973 year-classes was predominant.

Subarea 5 and Stat. Area 6

A. Status of the Fisheries

In 1976 the nominal all species catch totalled to 48 677 metric tons. That is a decline by 41 % in comparison to 1975, mainly due to the reduced herring quota and lower mackerel c. p. u. e.

Table 8: Nominal catches ('000 metric tons) in Subarea 5 and Stat. Area 6

	5 Z	6	total 1976	total 1975
Mackerel	2,75	35,40	38,15	48,4
Herring	7,89	+	7,89	30,9
Alewife	0,02	1,24	1,26	2,1
Squid	1,10	0,22	1,32	0,9
other species	0,03	0,03	0,06	0,3
total	11,79	36,89	48,68	82,6

1. Mackerel

As in previous years 85 % of mackerel catch was taken by factory trawlers and almost all the catch in spring (January through March) fishery.

Although the effort (days fished) in spring fishery increased by 25 % the nominal catch decreased from 35 637 tons in 1975 to 31 562 tons in 1976.

The autumn fishery also succeeded in lower c. p. u. e. .

Table 9: c. p. u. e. in metric tons per day fished (factory trawler type)

		mean	
		weighted	unweighted
Jan. - May	1974	59,0	53,4
	1975	44,2	49,3
	1976	43,1	41,0
Nov. - Dec.	1974	22,1	24,1
	1975	29,2	29,8
	1976	31,2	33,4

2. Herring

During August through October 7 888 tons herring were caught.

This sharp decline in comparison to 1975 is mainly due to reduced quota.

The shares of total catch amounted to 82 % and 18 % for special type trawlers ("Zubringertrawler") and factory trawlers, respectively.

During August and September an average catch per day fished (factory trawler type) of 38 tons was recorded. Taking into consideration the whole main season (10. Aug. - 15. Oct.), however, the average c. p. u. e. decreased from 36 in 1975 to about 31 metric tons per day fished (for comparison see GIR Res. Rep. 1975). That indicates a further decline in herring stock size, which is explicable by apparent weak recruitment of 1971 to 1973 year-classes.

3. Alewife

In 1976 a total of 1260 tons Alewife was caught during spring mackerel fishery in Stat. Area 6. The shares of total caught by factory and side trawlers amounted to 60 % and 40 %, respectively.

4. Squid

1 313 tons squid were caught during mackerel spring (996 tons, Illex) and herring autumn (317 tons, Loligo) fisheries.

B. Special Research Studies

1. Environmental Studies

Participating in Joint-Herring-Programme RV "Ernst Haeckel" worked 74 hydrographic stations for temperature and salinity in Subarea 5.

2. Biological Studies

a) Mackerel

For sampling on commercial catch see the following table.

Table 10: Numbers and sizes of samples from commercial catch

Month	State of samples	Number of samples	specimens measured	specimens aged
Feb.	round fresh	10	3 937	396
Feb.	frozen	1	100	100
Aprl	round fresh	47	16 272	297
Apr.	frozen	1	102	102
Oct.	round fresh	4	790	291
total	fresh and frozen	63	21 201	1 187

On board RV "Ernst Haeckel" 16 samples (1 127 specimens measured, 205 specimens in 5 samples aged) were taken in March (Div. 5 Z).

In research samples year-classes 75 (Subdiv. 5 Ze) and 72/73 (Subdiv. 5 Zw) were predominant. Most abundant in commercial catch were the 74 and 73 year-classes in spring and 74 year-class in autumn.

b) Herring

Almost all samples of commercial catch originate from one Special type trawler ("Zubringertrawler") and all from Subdiv. 5 Ze.

Table 11: Numbers and sizes of samples from commercial herring catch

Month	State of Samples	Number of Samples	specimens measured	specimens aged
Sept.	round fresh	25	6 120	1 376
Oct.	round fresh	4	859	198
total	round fresh	29	6 979	1 574

Further sampling was done by RV "Ernst Haeckel" in March (Sub-area 5, 1 217 specimens in 20 samples measured and 537 specimens in 9 samples aged).

In research samples year-classes 73 (50 %) and 70 (30 %) were most abundant, where as in commercial catch year-class 70 (65 % - 75 %) predominated.

c) Other Species

For sampling on other species see the following table.

Table 12: Numbers and sizes of samples (except mackerel and herring) taken in March 1976 by RV "Ernst Haeckel" (Div. 4 x, 5 Y, Subdiv. 5 Ze, 5 Zw)

Species	Numbers of samples	specimens measured
Pollock	22	132
Northern hagfish	2	36
Spiny dogfish	31	1 374
Skates	4	327
Little skate	20	291
Big skate	13	121
Thorny skate	10	53
Smooth-tailed skate	3	4
Atlantic torpedo	1	1
Blueback herring	19	1 013
Alewife	8	202
American shad	14	169
Congereel, American	2	9
Northern pipefish	2	4
Cusk	2	2
Fourbeard rockling	4	25
Atlantic cod	20	1 128
Haddock	28	2 133
Silver hake	27	3 666
Spotted hake	1	20
White hake	6	80
Red hake	22	1 182
Sea bass	1	1
Tilefish	2	8
Cunner	1	1
American sandlance	3	117
Atlantic wolffish	2	7
Ocean pout	14	386
Cusk eel	1	3
Butterfish	8	621

Species	Numbers of samples	specimens measured
Atlantic silverside	4	47
Redfish	6	17
Northern searobin	4	23
Arctic hookear sculpin	1	1
Polar sculpin	1	1
Atlantic sea raven	15	49
Longhorn sculpin	22	1 012
Shorthorn sculpin	3	3
Alligatorfish	1	1
Lumpfish	2	2
Summer flounder	6	83
Four spot flounder	14	324
Windowpane	22	1 347
Witch flounder	7	46
American plaice	9	82
Atlantic halibut	2	3
Yellowtail flounder	21	715
Winter flounder	7	133
Gulfstream flounder	8	194
Monkfish	13	25
total 50 species	471	17 224