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German Democratic Republic Research Report, 1978

by

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The overall nominal catch from GDR fisheries in the ICNAF Area in 1978 was 7,362 tons, a substantial decrease from 18,347 tons in 1977 and earlier years. The catches of all main species, except roundnose grenadier, were lower in 1978 than in 1977 (Table 1).

Table 1. Species composition of GDR catches in 1978 in the Northwest Atlantic.

	1978	1977
Capelin	404	1014
Alewife	-	69
Greenland halibut	1632	2528
Witch	51	203
American plaice	6	41
Cod	2177	4301
Roundnose grenadier	1801	674
Wolffishes	3	37
Redfishes	1061	1449
Mackerel	-	7981
Pollock	-	24
Atlantic halibut	2	-
Picked dogfish	-	6
Skates	42	11
Squid (Loligo)	-	9
Flatfishes n.e.i.	14	-
Sandeels	169	-
total	7362	18347

Subarea 0

A. Status of Fisheries

There was no commercial fishery in 1978.

B. Special Research Studies

The RV *Ernst Haeckel* in a random groundfish survey fished 35 stations. Catches consisted of 39 fish species. The most abundant were Greenland halibut, redfish and roundnose grenadier. The redfish and Greenland halibut were mostly juveniles, the mean length being very low. The size of Greenland halibut ranged from 10 to 100 cm, roundnose grenadiers from 16 to 100 cm, and redfish (*Sebastes mentella* Travin) from 12 to 51 cm (12-51 cm for males and 12-45 cm for females). A remark-

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able predominance of young year-classes of roundnose grenadier (1969, 1972 and 1973 year-classes) was noted.

Subarea 1

A. Status of Fisheries

No commercial fishing and no research was carried out in this area in 1978.

Subareas 2 and 3

A. Status of Fisheries

Some fishing occurred in Div. 2G, 2H, 2J, 3K, 3L, 3N and 3O, but the catches in 1978 were lower than in 1977 for all species except roundnose grenadier (Table 2). The total catch in 1978 was 76% of the catch in 1977. As in previous years, the main species were cod, roundnose grenadier, Greenland halibut, redfish and capelin. For the first time, a catch of 169 tons of sandeels was reported from Div. 3N and 3O in June and July (included in "Others").

Table 2. Nominal catch (tons) in SA 2 and 3 by divisions.

	2G	2H	2J	3K	3L	3N	3O	Total 1978	Total 1977
Cod	-	196	1751	175	42	13	-	2177	4301
Redfish	9	117	27	519	378	11	-	1061	1449
Roundnose grenadier	1354	433	-	13	1	-	-	1801	613
Greenland halibut	604	721	161	125	21	-	-	1632	1953
Capelin	-	-	-	227	121	41	15	404	1014
Others	-	33	37	34	12	134	37	287	316
	1967	1500	1976	1093	575	199	52	7362	9646

The entire fishing activity in 1978 was strongly associated with the quota regulations, so that the distribution of the fleet and also the realization of the fishery do not show in all cases the real catch possibilities and the effect of environmental conditions.

The cod fishery took place mainly in January and February and to a lesser extent in November and December. Roundnose grenadier and Greenland halibut were taken in October and November and small catches of capelin in April and November. Most of the redfish were caught in March, November and December.

The main part of the cod catch was taken in Div. 2J (80%), Greenland halibut in Div. 2G and 2H (37% and 44%), roundnose grenadier in Div. 2G and 2H (75% and 24%), redfish in Div. 2H, 3K and 3L (11%, 49% and 36%), and capelin in Div. 3K and 3L (56% and 30%). Cod was the most important species taken in 1978 but formed a smaller proportion of the total catch (30%) than in 1977 (45%). The fishery was conducted by factory ship and stern trawlers of the "Zubringer-Trawler" type. Also, as in previous years, bottom trawl was mainly used, but about 30% of the catches (fishery for capelin, sandeel and roundnose grenadier) was taken by mid-water trawl.

1. Cod. A specialized cod fishery was carried out in January and February with 89% of the total cod catch taken in Subarea 2 and 80% from Div. 2J. Thus the more southerly regions (particularly Div. 3K) were not so important for the GDR cod fishery in 1978 as in previous years.

Because of the short cod-fishing season and the changed conditions of the fishery, a comparison of effort data is very difficult. However, reports from the fleet indicated that the fishery was good and stable. The catch per hour of "Zubringer-Trawler" varied between 1.5 and 2.1 tons, this being somewhat higher than in 1977. The value of 2.1 was obtained in February which was also

the time of the main effort. For factory ships in the same period, the catch per hour varied from 2.1 to 2.5 tons. Catches were made mainly at depths of 300-450 m.

2. Greenland halibut. The Greenland halibut and roundnose grenadier fisheries are closely related. Only in June did one factory ship have its effort directed to Greenland halibut in Div. 2H, the catch rates being 0.3-1.4 tons per hour. The bulk of the Greenland halibut was caught in Div. 2G and 2H in October and November. This combined bottom and midwater trawl fishery was greatly affected by unfavorable fishing conditions (wind and bottom configuration). A group of "Zubringer-Trawler" exploited depths of 900-1400 m and also shallower water ranging from 375 to 550 m. Great variation in species composition and the size of the catches was noted, with Greenland halibut predominating in the smaller catches.
3. Roundnose grenadier. Although there was an increase in the catch from 1977 to 1978, the fishery was very disappointing. Most of the catches were taken in the latter part of September, and in October and November. A midwater trawl fishery was started in early October, and both the bottom and midwater trawl fisheries were hampered by bad weather conditions and rough bottom. It is uncertain whether the instability of the fishery was caused by environmental conditions or stock conditions. The catch per hour ranged from 0.2 to 4.4 tons in October and from 0.1 to 0.8 tons in November.
4. Redfish. The redfish fishery took place only for short periods. During the latter part of February, two factory ships operated in Div. 3L. Also, due to the poor condition of the capelin fishery, two factory ships caught redfish outside the Canadian 200-mile zone in Div. 3L and 3N in May and June. In December, factory ships had catch rates of 0.5-4.8 tons per hour, with great fluctuations in the catches.
5. Capelin. During two periods (May-June and October-November), a capelin fishery was carried out in Subarea 3, with 56% of the total capelin catch from Div. 3K, 30% from Div. 3L and the remainder from Div. 3N and 3O. Dense concentrations were not found and catches were low.

B. Special Research Studies

1. Environmental studies

During the random groundfish survey in September and October by the RV *Ernst Haeckel*, three ICNAF standard sections (Cumberland, Ryan's Bay and Seal Island) were occupied and surface and bottom temperature and salinity measurements taken at 127 stations on these sections. The depth of the stations ranged from 300 to 1000 m. Ranges of water temperatures and salinities are given in Table 3 and the air temperatures in Table 4.

Table 3. Temperatures and salinities in Div. 2G to 3K in September-October 1978.

ICNAF Div.		Temperature range (°C)	Salinity range (‰)
2G	Surface	0.4 to 2.1	31.0 to 35.5
	Bottom	0.9 to 4.3	32.4 to 34.8
2H	Surface	0.7 to 1.7	32.8 to 33.2
	Bottom	2.3 to 4.2	33.9 to 34.7
2J	Surface	1.5 to 4.7	32.0 to 33.7
	Bottom	0.3 to 4.2	33.2 to 34.8
3K	Surface	2.6 to 5.3	32.3 to 32.7
	Bottom	1.2 to 5.6	34.1 to 34.8

Table 4. Air temperatures (°C) in September-October 1978.

Div.	Mean	Maximum	Minimum
2G	-0.4	4.0	-4.0
2H	0.4	2.5	-2.0
2J	4.7	8.0	1.0
3K	3.4	7.0	0.0

2. Biological studies

From January to March 1978, fish were sampled on board of commercial vessels in Div. 2J, 3K and 3L. In September-October 1978, a groundfish survey was conducted by the RV *Ernst Haeckel*, especially for Greenland halibut and roundnose grenadier in Div. 2G and 3K and in Subarea 0.

Table 5. List of biological samples taken in Subareas 2 and 3 in 1978.

Species	sampling area	month	measured	aged
Cod	2 G	October	33	-
	2 H	October	149	138
	2 J	January	1256	-
		February	3981	440
		March	137	-
		September	355	-
	3 K	February	307	80
		October	200	94
Greenland halibut	2 G	October	2054	717
	2 H	October	1031	507
	2 J	March	1404	178
		September	2178	406
	3 K	October	1215	421
Roundnose grenadier	2 G	October	923	172
	2 H	October	482	69
	2 J	September	924	278
	3 K	September	507	157
Redfish	2 G	October	2274	247
	2 H	October	2266	379
	2 J	October	6396	726
	3 K	October	9097	1214
Capelin	2 J	May	595	100

- a) Cod. Investigations from commercial catches in January-March and from research catches in September-October show an increase in the proportion of older age-groups and also in the mean length for 1978 compared to 1977. The 1973 year-class dominated in all samples. As in former years, more than 5 year-classes appeared in the catches. Also, the increase in mean length (>50 cm) indicate improvement in the condition of the stock. This seems to be the result of quota regulations and confirms their necessity.

The mean length varied between division, season and type of fishing (Table 6).

Table 6. Mean length (cm) of cod in 1978 samples by division, season and type of fishing.

Div.	Mean length	No. of fish	Month	Type of fishing	Depth (m)
2G	56.1	33	Oct	Research	371-401
2H	56.6	149	Oct	"	320-410
2J	54.0	355	Sep	"	301-880
3K	53.7	200	Sep	"	315-352
2J	49.6	1256	Jan	Commercial	245-310
2J	51.3	307	Feb	"	245-470
2J	44.1	137	Mar	"	275-290
3K	57.3	307	Feb	"	260-275

- b) Capelin. Examination of frozen fish (one sample) showed a length range of 15-21 cm (mean 18.3 cm) for females and 13.5-22 cm (mean 18.7 cm) for males. The male to female ratio was 20:80 and the 1975 year-class predominated (53.3%).
- c) Roundnose grenadier. The length and age compositions and sex ratio varied from area to area. The 1963 and 1964 year-classes predominated in Div. 2G, 2H and 2J, but the 1967-70 year-classes were the major ones in Div. 3K. Mean lengths and sex ratios are given in Table 7. Sex determination was not possible for all specimens.

Table 7. Mean lengths and sex ratios for roundnose grenadier by Division, 1978.

ICNAF Div.	Mean length (cm)		Sex ratio (%)		Depth (m)
	Male	Female	Male	Female	
2G	56.90	53.12	55.1	44.1	301-800
2H	63.98	63.41	61.8	38.3	401-750
2J	63.17	61.83	53.9	26.4	401-750
3K	47.58	45.87	47.2	49.7	501-1000

- d) Redfish. The age composition showed a predominance of the 1970 and 1971 year-classes in Div. 2G and 2H. Older year-classes were found in Div. 2J (1965, 1968) and in Div. 3K (1964, 1965). The variation in mean length by division for samples taken in October 1978 is as follows:

Div.	Length range (cm)	Mean length (cm)
2G	8-48	29.4
2H	9-48	28.8
2J	8-52	31.1
3K	7-59	32.4

- e) Greenland halibut. The length and age composition show a distinct decrease from north to south. The 1970, 1971 and 1972 year-classes predominated in Div. 2G and 2H. The age composition in Div. 2J were different in March and September, and younger year-classes prevailed (1974, 1975). The younger year-classes (1972-76) were also major ones in Div. 3K. Mean lengths by division, month and sex are as follows:

Div.	Month	Mean length (cm)	
		Male	Female
2G	Oct	58.9	60.7
2H	Oct	50.9	53.0
2J	Mar	49.1	50.9
2J	Sep	44.8	51.4
3K	Oct	29.9	34.5