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German Democratic Research Report for 1988

by

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Introduction

The total catch within the NAFO convention area amounted to 27 648.3 t in 1988 (Table 1). This corresponds to an insignificant decrease of 0.3 % compared to 1987 (27 734.5 t).

Decreasing catches of the fish species redfish (38 %), Greenland halibut (31 %), and roundnose grenadier (24 %), but otherwise an increasing catch of Atlantic mackerel (13 %), were a characteristical sign of the G.D.R. fishery in 1988 compared to 1987. The decreasing catches of redfish, Greenland halibut, and roundnose grenadier were caused by the small results at the beginning of roundnose grenadier directed fishery (Tables 3 and 5), and by the bad weather conditions during the Greenland halibut directed fishery (Tables 3 and 6). Consequently the decrease of catches of roundnose grenadier and Greenland halibut are not conditioned by the fish stocks.

As the main fish species the Atlantic mackerel of the US-shelf made up 75 % of the total G.D.R. catch in the convention area (1986 72 %, 1987 67 %). Greenland halibut with a portion of 8 % (1986 7 %, 1987 12 %) and roundnose grenadier with a portion of 12 % (1986 13 %, 1987 16 %) are the main fish species next the Atlantic mackerel as in 1986 and 1987. Again these three species supported the G.D.R. fishery in the NAFO area with a portion of 96 % - as in 1986 and 1987 with 96 % and 95 % respectively (Tables 1 and 2).

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* Introduction and Subareas 2+3 by P. Ernst; Subarea 5+6 by R. Eggers

Fisheries were carried out within the Subareas 2, 3, 5 and 6. Again - as in the years before - Subarea 6 dominated with a catchrate of 19 126.3 t (Atlantic mackerel only), these are 69 % (1987 58 %) of total G.D.R. catch within the NAFO area, followed by Subarea 3 (5 220.2 t corresponding to 19 % - 1987 23 % - of total catch; directed roundnose grenadier fishery), by Subarea 5 (1977.7 t corresponding to 7 % - 1987 9 % - of total catch; directed Atlantic mackerel fishery), and by Subarea 2 (1 324.1 t corresponding to 5 % - 1987 10 % - of total catch; directed Greenland halibut fishery) (Table 2).

Subareas 2 and 3

A Status of fishery

It is neccessary to analyse together the status of fishery of the Subareas 2 and 3 because the basis are the licence conditions and overlapping fisheries on the target fish species roundnose grenadier and Greenland halibut.

In the Subareas the fisheries were carried out by bottom trawl only.

The timing of the fisheries had been performed in dependence on licence conditions according to table 3. The fisheries were carried out by ship-type FVS IV only (new generation of catch and processing sterntrawler, 1.943 BRT, FAO-code 090).

1. **Redfish directed fishery (NAFO 3 L,N, 28.7.-15.8.; 9.9.-18.9.).**

   As in the years before the redfish directed fishery was much more expensive concerning materials and also depended considerabely on weather conditions and currents. The fishery was carried out at the general position 47°57'N to 48°04'N and in the fishing depths from 320-380 meters. The catch per unit effort slightly decreased during the season (July 1.24 mt/h, August 1.02 mt/h, September 0.86 mt/h) and the same was to observe in the development of the portion of redfish in the total catch (July 95 %, September 67 %) (Tab. 4).

2. **Roundnose grenadier directed fishery (Subarea 2+3; 16.8.-22.11.)**

   As in the years before the fishing started within the Division 3K in fishing depths from 1200 to 1500 m.First

the results were unsatisfactory. Additionaly the fishery was restricted by the high by-catch level of Greenland halibut in the trawls (more than 30 % in small mesh size gears).

From September the fishery had expanded to the south up to 50°10'N in fishing depths from 900 to 1500 m. In this area the results were successful since middle of October. The results were stable up to the end of licence (22. November). Therefore the c.p.u.e. increased during the season (August 0.60 mt/h, September 0.64 mt/h, October 0.71 mt/h, November 0.98 mt/h). More or less the proportion of roundnose grenadier in the catches was stable and amounted to 70-75 %. The by-catch of Greenland halibut fluctuated between 20 and 30 % (Tab. 5).

3. Greenland halibut directed fishery (Division 2H; 23.11.-29.12.).

Fishing was carried out within the area 55°55'N-56°08'N and 56°20'N-56°33'N. Fishing depths were between 900 and 1400 m. The northern part of the fishing area was more successful than the southern part.

On average the c.p.u.e. amounted to 0.45 mt/h up to 2.10 mt/h. The c.p.u.e. increased continually during the season (November 0.86 mt/h; December 1.03 mt/h).

The proportion of Greenland halibut increased continually on the average from 80 % to 95 % during the fishing time. In the same time the proportion of roundnose grenadier decreased continually in average from 14 % to 3 % (Tab. 6).

As in the year before it has to be considered that it was only possible to trawl mostly in one direction because of long-lasting periods of bad weather conditions (November 3 days and December 7 days falling out of trawl possibilities) and extreme currents. By this the efficient time of fishing was considerably reduced. Fishing was stopped because the licence ended.

B Special Research Studies

1. Environment

No data

2. Biological Studies

Redfish (Sebastes mentella TRAV.)

Biological data are only available from Division 3L (July and August). The range of total length was 25-40 cm (L_t)

in July, and 23-24 cm (L_t) in August, respectively. The results of the analysis were processed according to NAFO requirements and are available at the NAFO secretariate.

Roundnose grenadier (Coryphanoides repestris GUNN.)

Sampling materials were collected onboard the processing vessels for analysis ashore and aboard. The sampling program was carried out during the roundnose grenadier directed fishery within the period from 28.9.-21.11.88. The results of the analysis were processed according to NAFO requirements and will be available at the NAFO secretariate. The G.D.R. catch given in number per age groups is presented on Table 8.

Summarized length distribution by fishing depths and sex is given in Figure 1. The average length of individuals increased with fishing depths. The sex-ratio fluctuated between 51-77 % for males, and corresponding between 33-49 % for females. In average the portion of males amounted to 63 %. The part of males was higher in the shallower waters (900-1100 m).

During the time of investigation the distribution of maturity was the following:

stage of maturity	1	2	3
males (%)	29.8	67.0	3.2
females (%)	19.3	70.4	10.3

Greenland halibut (Reinhardtius hippoglossoides WALB.)

Sampling material was collected onboard processing vessels for analysis ashore and aboard. The sampling program was carried out during the Greenland halibut directed fishery (NAFO 2H) within the period 24.11.-2.12.88 only.

The mean lengths and sex ratio shifted and were as follows:

position (°N)	period	depth interval(m)	mean lengths(cm)	sex ratio ♂	♀
56°20'-56°32'	25.-27.11.	1050-1100	53.8	53	47
56°20'-56°32'	28.11.	1550	59.2	43	57
55°56'-56°09'	29.11.-1.12.	900- 930	50.4	44	56
56°20'-56°32'	2.12.	1020	50.5	50	50

The mean lengths increased along with increasing depths as in the results of the years before. In the same way the relation of sexes was shifting in favour of the females. May be the

investigations are not representative, therefore these identification are in opposite to the results of the years before. The mean lengths by sex are given in Figure 2. The G.D.R. catch in number per age groups is given in Table 7.

For the period of investigations on maturity the distribution showed the following relation on the average given in %.

stage of maturity	1	2	3	4
males	34	40	25	1
females	27	65	7	1

In the northern part the males (52.7 %) dominated insignificantly in the shallower fishing grounds. In the southern and deeper fishing grounds the proportion of females amounted to 57 %, more or less. This situation is typical for the start of the spawning migration to the north of this fishing ground.

Special investigations on Greenland halibut were carried out and prepared as NAFO-SCR-Documents for 1989. These are

-"Results of parasitological investigations as an index of stock deliminations concerning occurrences of Greenland halibut in the Northwest Atlantic"

- the teamwork under the authorship of scientists of Canada, U.S.S.R., and G.D.R. which is titled "Stock assessment of Greenland halibut (Reinhardtius hippoglossoides WALB.) in NAFO subareas 0,1,2, and Divisions 3K,L with projected catches for 1990".

Subareas 5 and 6

A Status of fishery

Mackerel (Scomber scombrus L.)

The fishing season for mackerel 1987/88 started on the 19.12.1987 south of Long Island at 40°N, 73°30'W. There good catches could be reached. At the end of December the fishing situation grew worse by the middle of January, because small indications of mackerel were found between strong concentrations of herring.

From the beginning of the second decade of January in Divisions 615 and 616 indications of mackerel could be fished. At the same time the indications of herring shifted into the coastal zone. The best fishing time was in the first half of the night.

The fishery in the first half of January was very variant, but occasionally with very high catches.

In February in spite of continuous search in the area of Hudson Canyon high catches could be obtained. Herring and spiny dogfish occurred as by-catch. Fishing was done in depths from 60 to 80 meters.

At the beginning of the second decade of March there were short-time fishing possibilities in shallow water between Delaware lightship and Cape Charles which was due to the influx of warm water.

From the 15.3. the fishery was conducted again in Division 616 in depths from 60 to 150 meters.

The best catches were obtained at night. From the end of March and occasionally in April fishing was done in Div. 616 and 537. Good catches could be realized especially in night time.

From the end of April with increasing instability in the fishery of mackerel the strong herring concentrations grew a problem, as well as the more frequent appearance of marine mammals.

The catch of several pilotwhales which could not be avoided resulted in a break off of the fishery the 5.5.88.

B Special Research Studies

1. Environment

   No data

2. Biological Studies

   Within the first and second quarter biological sampling material had been collected aboard the processing vessels for further treatment ashore. The results of the analysis were summerized and represented on Table 9 (Length distribution) and Table 10 (age distribution). The length-age-distribution is available at the NAFO secretariate according to the guiding rule. In Table 11 is given the G.D.R. catch by number and by Division.

Table 1: G.D.R. nominal catches (tons) of species in the NAFO-area for 1987 and 1988

Species	1987	1988
Cod	32.1	29.3
Redfish	1074.5	660.1
Roundnose grenadier	4464.2	3379.6
Greenland halibut	3266.2	2246.4
American plaice	1.0	5.9
Roughhead grenadier		48.7
Skates and rays, n.e.i.	176.1	152.1
Greenland shark	1.6	-
Catfish	2.9	0.5
Baird's smoothhead	18.8	11.6
Atlantic mackerel	18489.2	20909.9
Alewife	26.4	28.3
Witch	56.4	9.8
Long-finned squid	0.4	1.4
Silver hake	1.9	3.8
Cat.-requiem sharks	1.6	-
Atl. butterfish	0.2	0.5
Red and white hakes	84.7	0.4
Atl. halibut	0.7	-
Marine fishes n.e.i.	35.6	160.0
Total	27734.5	27648.3

Table 2: G.D.R. nominal catches (tons) of species by Divisions of the Subareas 2,3,5,and 6 for 1988

	2H	2	3K	3L	3	5Zw	5	6A	6B	6C	6
Cod	-	-	0.2	29.1	29.3	-	-	-	-	-	-
Redfish	-	-	0.2	659.9	660.1	-	-	-	-	-	-
Roundnose grenadier	107.5	107.5	3268.8	3.3	3272.1	-	-	-	-	-	-
Greenland halibut	1200.8	1200.8	1010.1	35.5	1045.6	-	-	-	-	--	-
American plaice	5.7	5.7	-	0.2	0.2	-	-	-	-	-	-
Roughhead grenadier	0.8	0.8	-	47.9	47.9	-	-	-	-	-	-
Skates and rays, n.e.i.	8.1	8.1	89.8	54.2	144.0	-	-	-	-	-	-
Catfish	0.3	0.3	0.1	0.1	0.2	-	-	-	-	-	-
Baird's smoothhead	0.3	0.3	11.3	-	11.3	-	-	-	-	-	-
Atlantic mackerel	-	-	-	-	-	1971.8	1971.8	18708.3	221.5	8.3	18938.1
Alewife	-	-	-	-	-	3.4	3.4	24.9	-	-	24.9
Witch	0.3	0.3	-	9.5	9.5	-	-	-	-	-	-
Long finned squid	-	-	-	-	-	0.6	0.6	0.8	-	-	0.8
Silver hake	-	-	-	-	-	-	-	3.8	-	-	3.8
Atl. butterfish	-	-	-	-	-	0.5	0.5	-	-	-	-
Red and white hakes	0.3	0.3	-	-	-	-	-	0.1	-	-	0.1
Marine fishes, n.e.i.	-	-	-	-	-	1.4	1.4	157.9	0.7	-	158.6
Total	1324.1	1324.1	4380.5	839.7	5220.2	1977.7	1977.7	18895.8	222.2	8.3	19126.3

Table 3: Timetable of the G.D.R. in the NAFO-Subareas 2 and 3 in 1988

Period	Type of trawler	Regions of NAFO	Species directed fishery	Days on ground
28.07.-15.08.	FVS IV[1]	3L,N	Redfish	43
16.08.-22.11.	FVS IV[1]	2H+3K,L	Roundnose grenadier	446
09.09.-18.09.	FVS IV[1]	3L	Redfish	20
23.11.-29.12.	FVS IV[1]	2H	Greenland halibut	172
				681

[1] New generation of sterntrawler (catch and processing), 1.943 BRT (FAO code 090)

Table 4: Catch per day on ground and catch composition (%) during the redfish directed fishery

Period	catch per day on ground (t)	RED	GHL	Other
28.07.-31.07.	21.2	92	2	6
01.08.-07.08.	11.0	86	2	12
08.08.-14.08.	9.2	81	2	17
15.08.	10.8	77	4	29
09.09.-11.09.	11.6	66	3	31
12.09.-18.09.	8.9	64	6	30

Table 5: Catch per day on ground and catch composition (%) during the directed roundnose grenadier fishery

Period	catch per day on ground (t)	RNG	GHL	Other
16.08.-21.08.	6.5	75	24	1
22.08.-28.08.	8.2	78	22	+
29.08.-04.09.	5.5	70	28	2
05.09.-11.09.	4.3	74	23	3
12.09.-18.09.	7.7	70	28	2
19.09.-25.09.	9.9	67	29	4
26.09.-02.10.	9.8	79	19	2
03.10.-09.10	7.9	75	22	3
10.10.-16.10.	10.5	78	20	2
17.10.-21.10.	12.0	78	20	2
24.10.-30.10.	11.9	75	22	3
31.10.-06.11.	16.4	74	24	2
07.11.-13.11.	11.1	79	19	2
14.11.-20.11.	11.2	72	27	1
21.11.-22.11.	13.6	69	29	2

Table 6: Catch per day on ground and catch composition (%) during the directed Greenland halibut fishery

Period	catch per day on ground (t)	GHL	RNG	Other
23.11.-27.11.	10.0	86	10	4
28.11.-04.12.	8.3	80	18	2
05.12.-11.12.	5.5	92	7	1
12.12.-18.12.	7.3	94	6	+
19.12.-25.12.	9.0	97	3	+
26.12.-29.12.	7.0	95	4	1

Table 7: G.D.R. Greenland halibut catch by numbers in 1988 (NAFO-Divisions 3K, 2H)

age group	numbers (x 10^3)
4	90.8
5	159.5
6	239.9
7	527.8
8	363.5
9	142.1
10	87.3
11	42.9
12	25.8
13	22.3
14	5.1
Total	1707.0

Table 8: G.D.R. roundnose grenadier catch by numbers (NAFO-Division 3 K)

age group	numbers (x 10^3)
3	10.26
4	52.48
5	338.04
6	1083.96
7	1696.65
8	2268.37
9	2590.50
10	1417.34
11	1256.01
12	446.14
13	327.02
14	212.85
15	56.36
16	23.33
17	17.03
18	5.60
19	17.35
Total	11824.29

Table 9 : Length distribution (fork length in o/oo) of Atlantic mackerel in catches taken by commercial pelagic trawls NAFO-Div. 5Zw, 6A, 6B, 6C, February-May 1988

Division	5ZW				6A			6B	6C	
month / Lf(cm)	March	April	May	Feb	Feb[x]	March	April	March	Feb	Feb[x]
23				7						
24				9				14		
25			4	16		+		38		
26				35		1	3	48		
27		1	7	25		4	2	86		
28		1	11	41	3	3	7	73		
29		2	39	77	5	14	13	97		
30		2	28	120	5	15	25	163	10	
31		9	24	158	21	14	23	52	7	
32		10	22	251	64	19	15	28	10	31
33	8	41	49	137	104	43	56	41	140	188
34	71	156	150	52	314	191	151	93	180	312
35	228	251	277	27	295	250	244	104	330	281
36	183	248	174	22	118	186	186	81	220	156
37	149	136	84	10	32	115	120	28	40	16
38	87	67	45	7	16	54	68	21	54	
39	85	17	24	3	13	23	13	9	10	16
40	65	10	6	1	5	19	10	12		
41	37	14	9	+	+	19	17			
42	73	16	28	+	3	16	19	7		
43	14	14	15	+		9	23	5		
44		4	4			2	4			
45						1				
total	1000	999	1000	998	998	998	999	1000	1001	1000
No. fish meas.	355	1527	535	3333	373	2251	1262	578	300	64
mean length(cm)	37,7	36,3	35,5	31,6	34,9	36,0	36,0	31,8	35,4	35,0

[x]catches frozen

Table 10: Age distribution (in o/oo) of Atlantic mackerel in catches taken by commercial pelagic trawls NAFO-Division 5 Zw, 6A, 6B, 6C, February-May 1988

Division	5Zw			6A				6B	6C
month / Age	March	April	May	Feb	Feb[x]	March	April	March	Feb[x]
2		10	97	399	12	41	48	365	
3	8	38	60	272	89	49	59	275	82
4		72	74	169	120	114	84	47	137
5	188	232	205	83	298	233	236	79	253
6	445	512	440	61	431	383	478	189	528
7	168	82	67	11	34	109	24	21	
8	83	17	17	2	8	26	27	9	
9	26	12	12	+		7	17		
10	37	7	10	1	3	21	10	12	
11	45	6	5	+		10	7		
12		8	10		3	3	9		
13		2	2			2			
14		1	1						
15									
16				+		+		3	
Total	1000	999	1000	998	998	998	999	1000	1000

[x]catches frozen

Table 11 : G.D.R. Atlantic mackerel catch by numbers in 1988

Div. 5Zw

age group	March numbers($x10^3$)	April numbers($x10^3$)
2		117.93
3	2.61	157.25
4		257.31
5	61.40	804.08
6	145.34	1761.85
7	54.87	278.75
8	27.11	60.75
9	8.49	42.88
10	12.09	25.02
11	14.70	17.87
12		28.59
13		7.15
14		3.57
Total	326.61	3563.00

Div. 6A

age group	January number($x10^3$)	February number($x10^3$)	March number($x10^3$)	April number($x10^3$)	May number($x10^3$)
2	66.44	107.90	388.48	397.05	81.35
3	492.77	800.25	464.28	488.04	99.99
4	664.41	1078.99	1080.17	694.83	142.37
5	1649.95	2679.49	2207.72	1952.14	399.98
6	2386.34	3875.38	3629.00	3953.92	810.12
7	188.25	305.71	1032.80	198.52	40.68
8	44.30	71.93	246.36	223.34	45.76
9			66.33	140.62	28.81
10	16.61	26.98	198.98	82.72	16.95
11			94.75	57.90	11.86
12	16.61	26.98	28.43	74.45	15.25
13			18.95		
14					
15					
16			9.47		
Total	5525.68	8973.61	9465.72	8263.53	1693.12

Div. 6B

age group	January numbers($x10^3$)	March numbers($x10^3$)
2	87.14	162.24
3	65.65	122.23
4	11.22	20.89
5	18.86	35.12
6	45.12	84.01
7	5.02	9.33
8	2.15	4.00
9		
10	2.86	5.33
11		
12		
13		
14		
15		
16	0.72	1.33
Total	238.74	444.48

Div. 6C

age group	February number($x10^3$)
3	1.56
4	2.61
5	4.82
6	10.05
Total	19.04

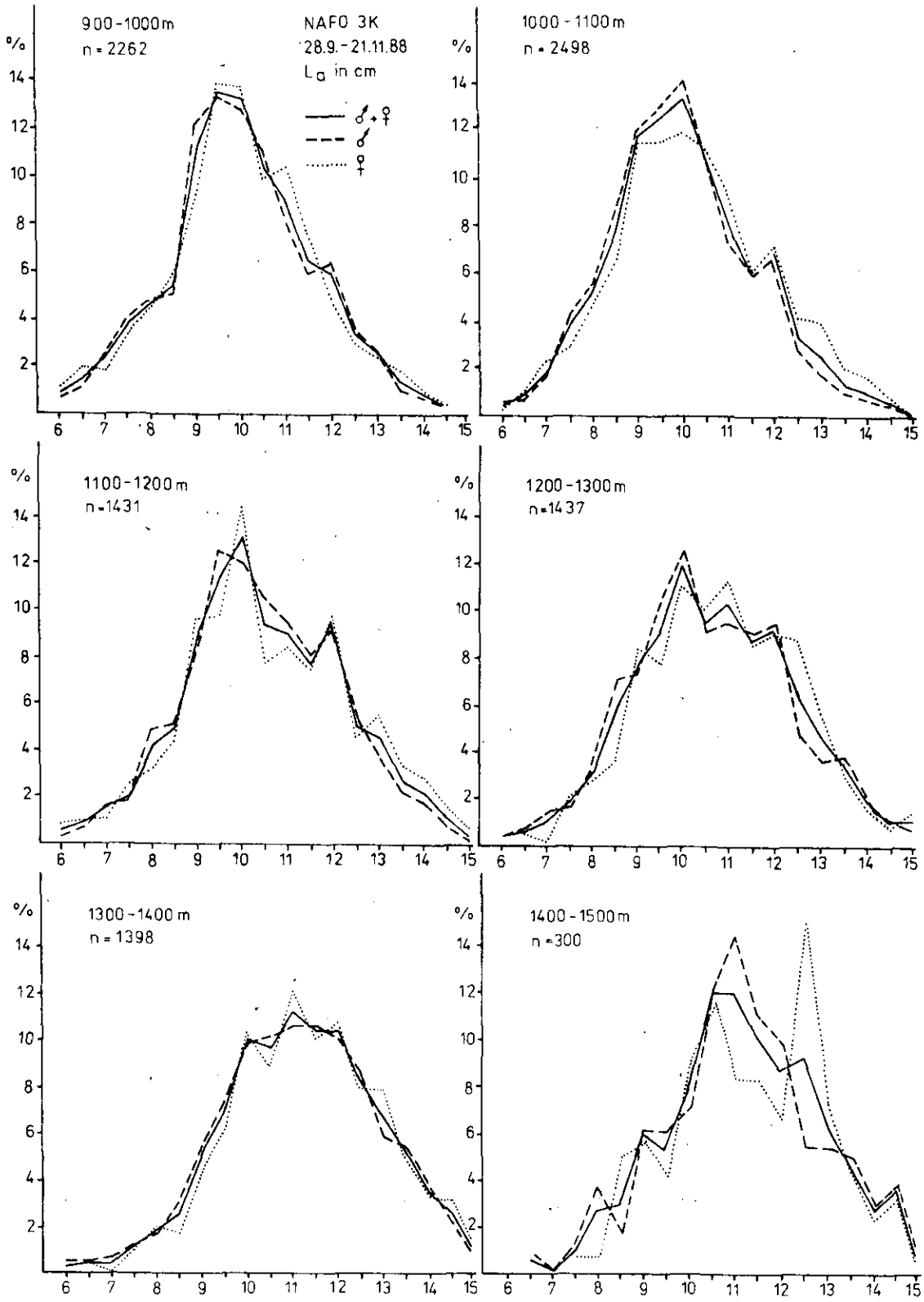

Fig.1 : Length distribution of roundnose grenadier

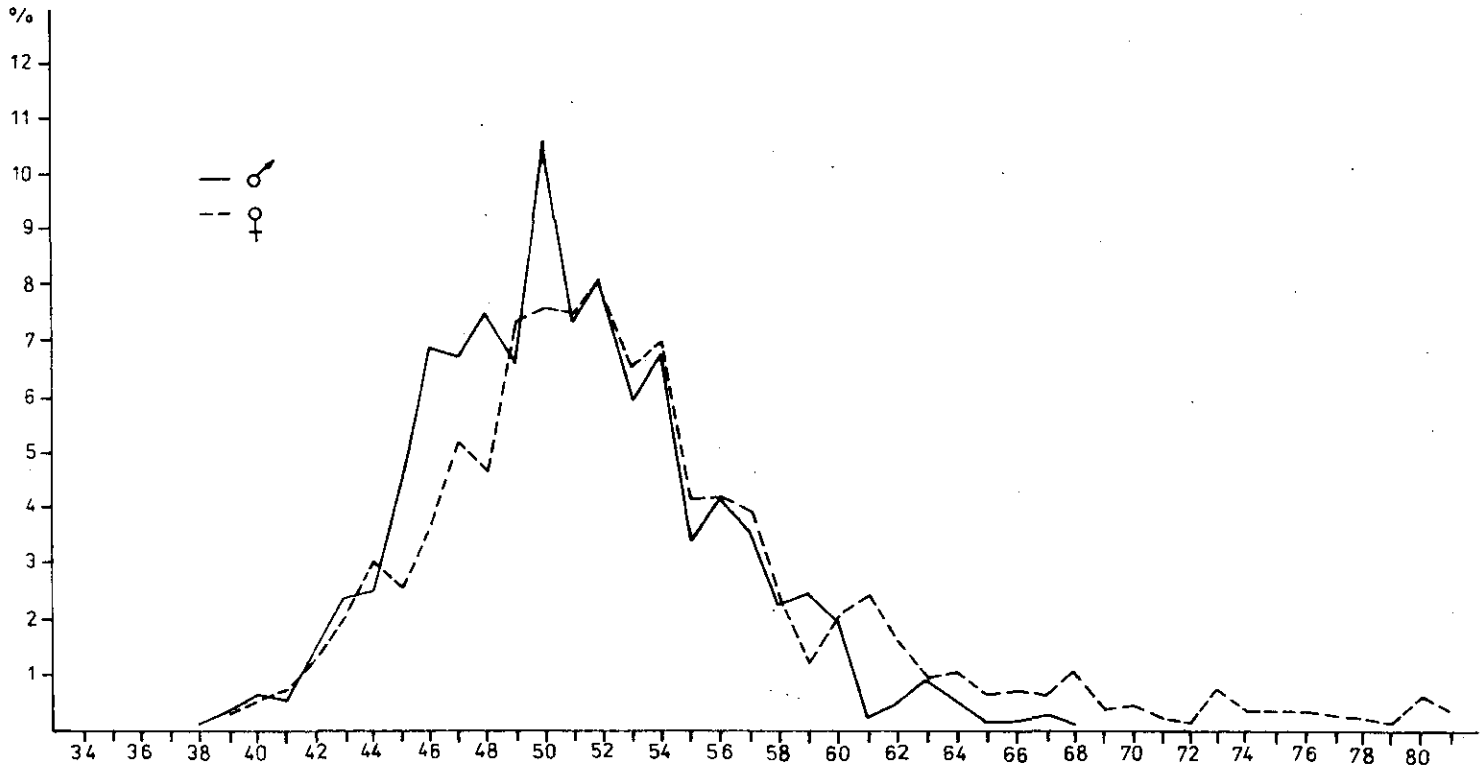

Fig. 2 : Length distribution (L_t cm) of Greenland halibut by sex, NAFO 2H, 25.11. - 2.12.1988