

Northwest Atlantic



Fisheries Organization

Serial No. N2192

NAFO SCR DOC.93/15

SCIENTIFIC COUNCIL MEETING - JUNE 1993

Results from Greenland Halibut Assessment in Divisions OB, 2GH
by the Data from 1992 Trawl Survey

by

K. V. Gorchinsky
Polar Research Institute of Marine Fisheries and Oceanography (PINRO)
6 Knipovich Street, 183763, Murmansk, Russia

ABSTRACT

Greenland halibut stocks in Divs.OB, 2GH are still remaining at a stable low level. Due to heavy ice conditions in autumn 1992 the trawl survey has covered only about 40% of Div.OB, surveyed in 1991. Greenland halibut abundance made up 37.5 mill.spec. and biomass - 31.7 thou.t, which corresponded to the level of 1987. The area investigated in Divs.2GH was 50% lower compared to a previous year. Halibut stock constituted 22.4 mill.spec. or 14.5 thou.t. This estimate is close to that for 1991.

INTRODUCTION

Greenland halibut catch in Divs.O, 2 essentially varies in different years. It was repeatedly pointed out at NAFO Scientific Council Meetings that a body of halibut investigations, conducted in the area of stock management, does not give a sufficient information on using the analytical methods for this species stock assessment. Under such conditions one can judge reliably by existing status of stocks and to forecast their variations with allowance for recruitment only by results from trawl surveys.

MATERIAL AND METHODS

Standard stratified random survey for halibut stock assessment has been carried out by RV "Kapitan Shaitanov". A bottom trawl (34.0/27.4 m) was used as a fishing gear, as in the previous years. Haul duration was 1 hour, with the fishing efficiency taken to be 1. Detailed description of the survey methods has been given earlier (Konstantinov, 1981; Bulatova, Glumkov, 1986). The investigations in Divs. OB were carried out from 25 to 29 November. In total 26 valid hauls have been done from 500 to 1500 m depths over the area about 13.9 thou.mile² (Fig.1). Due to heavy ice conditions in the Davis Strait and Labrador area, observed in autumn-winter 1992, the survey area has been essentially reduced. Only 7 strata, relatively free of ice, have been covered.

In Divs. 2GH the investigations were conducted from 30 November to 15 December. 73 valid hauls have been done from 200 to 1500 m depths (Figs. 2 and 3). Area surveyed in Div.2G amounted to 8.4 thou.sq.miles and 1.5 thou.sq.miles - in Div.2H.

RESULTS AND DISCUSSION

Div.OB.

Greenland halibut were caught over the whole area surveyed. The main portion of the stock was distributed at 1000-1250 m depths, total abundance of halibut made up 37.5 mill.spec. and biomass - 31.7 thou.t (Table 1). The estimates obtained were the lowest for the period since 1986 and were at the level of 1987 (Fig.4). As the 1992 survey covered only about 40% of the area, in which it was conducted in previous years, a size of stock can be corrected by recalculating to the strata unsurveyed. By results from the surveys for three preceding years the abundance and biomass constituted from 56.2 to 76.6% (on the average 68.1%) and from 72.9 to 88.4% (on the average 83.0%), respectively, in 7 strata covered. Thus, Greenland halibut total stock is assumed to make up about 55.2 mill.spec. and 38.1 thou.t in Div.OB in 1992, which corresponded to the 1991 level.

Length of males from catches varied from 20 to 61 cm with the mean length being 43.9 cm. Females were 21-76 cm long with the mean length being 46.5 cm (Fig.5).

In all strata investigated (excluding Stratum 4) a portion of males was considerably higher against females, with sex ratio to be 2:1.

A majority of fish analysed were immature. Maximum amount of mature males (38.7%) was registered at 1250-1500 m depths and females (5.7%) - at 1000-1250 m depths. As in 1991, a trend towards reduction has been observed in a portion of large mature females from catches, caught only at very low depths (below 1200 m).

Three age groups - 7, 5 and 6 (in descending order), which constituted about 80% of the total amount of fish analysed, have been distinguished (Fig.6). Compared to 1991 a portion of fish at age 8 decreased much.

Divs. 2GH

Halibut occurred over the all depths surveyed. Its maximum amount has been registered at 1150-1300 m depths. In 1992 halibut abundance and biomass made up 22.4 mill.spec. and 14.5 thou.t, respectively (Table 2). These indices are at the 1991 level, however, the area has been covered approximately by 50% less compared to the previous year.

Halibut males were 13-61 cm long with 38.2 cm mean length; females - from 12 to 89 cm long with the mean length being 39.0 cm (Fig.5).

Greenland halibut age composition in Divs.2GH was more homogeneous in contrast to Div.OB, i.e. approximately equal amounts of males at age 2-7 and females at age 2-9 have been registered (Fig.6).

Nearly all specimens caught to 750-1000m depths were immature. Maximum quantity of maturing specimens (about 10% of males and 14% of females) were observed over the range of 1250-1500 m. On the whole, males prevailed scarcely in catches taken from the area.

In common with Div.OB a relative reduction in a spawning portion of population, being observed since 1991, was found. Probably, redistribution of mature large specimens over low depths due to abnormally cold hydrographic regime, as well as to long-line fishing pressure, withdrawing the largest specimens selectively, were the reasons for that (Gorchinsky, Vaskov, 1992). The question to be settled requires additional studies, however, a reduction found in the spawning portion of population can negatively influence the status of Greenland halibut stocks in the nearest years.

REFERENCES

- BULMATOVA A.Y. AND A.K.CHUMAKOV. 1986. USSR Trawl surveys in NAFO subareas 0, 2, 3. NAFO SCR Doc. 86/66, Ser. No 1183, 13 p.
- GORCHINSKY K.V. AND A.A.VASKOV. 1992 Trawl survey results and Greenland Halibut stock evaluation in NAFO divs. OB and 2GH in october/december 1991. NAFO SCR Doc. 92/22, Ser. No.2069, 20 p.
- KONSTANTINOV KG. 1981. Methods and results of the total trawl survey of bottom fish in subarea 3 in 1971-1980. NAFO SCR Doc. 81/6, Ser. No. 73.

Table 1. Results of the trawl survey on Greenland halibut in OB div. November, 1992

Stratum No.	Depth, m	Trawl- quan- tity	Mean		Mean catch		Abundan- ce, thou- sand spec.	Bio- mass, t
			length, cm	mass, g	per 1 trawl- spec.	trawl- kg		
4	501 - 750	3	44,14	845	19,3	16,3	3344,6	2824,7
11	501 - 750	3	38,85	565	42,3	23,9	3623,4	2047,1
5	751 - 1000	5	41,65	663	75,6	50,1	5796,0	3841,4
12	751 - 1000	3	41,31	647	33,3	21,6	1164,2	752,8
6	1001 - 1250	6	46,08	894	216,5	193,5	15836,6	14151,0
13	1001 - 1250	3	45,03	826	142,7	117,9	1812,4	1497,2
7	1251 - 1500	3	48,82	1103	97,7	107,8	5936,0	6549,3
Total		26					37513,2	31663,5

Table 2. Results of Greenland halibut trawl survey in 2G Div. November-December, 1992.

Stratum No.	Depth, m	Trawlings quantity	Mean		Mean catch per 1 trawl		Abundance, thou. spec.	Biomass t
			length, cm	mass, kg	spec.	kg		
909	< 200	3	42,15	660	1,7	1,1	171,2	113,0
901	201 - 300	3	25,07	187	22,3	4,2	1003,3	167,8
908	- " -	3	29,88	279	3,0	0,8	65,0	18,2
902	301 - 400	3	27,59	224	32,7	7,3	145,2	32,5
923	- " -	2	20,95	85	54,5	4,6	375,4	31,8
903	401 - 500	3	27,09	213	107,3	22,8	318,0	67,6
922	- " -	2	26,09	131	33,0	4,3	227,3	29,8
904	501 - 750	3	34,79	401	160,3	40,2	568,6	227,8
914	- " -	-	-	-	72,4	27,7	303,1	116,1
921	- " -	2	33,34	343	44,5	15,3	234,0	60,5
929	- " -	3	40,62	658	90,0	59,2	4203,3	2764,7
905	751 - 1000	5	35,72	402	148,0	59,4	899,0	361,0
915	- " -	-	-	-	119,9	53,8	425,2	191,4
920	- " -	4	38,44	526	91,6	48,2	584,5	307,6
906	1001 - 1250	4	40,39	640	160,0	102,4	1357,0	868,1
916	- " -	-	-	-	115,0	81,1	621,9	438,4
919	- " -	4	44,78	854	70,0	59,8	819,3	699,6
907	1251 - 1500	3	48,00	1086	83,7	90,8	1115,6	1211,3
917	- " -	-	-	-	90,0	94,9	550,0	580,0
918	- " -	3	48,13	1027	96,3	99,0	1837,5	1887,8
Total		50					15825,4	10214,8

Table 3. Results of Greenland halibut trawl survey in 2H Div. December, 1992.

Stratum No.	Depth, m	Trawlings quantity	Mean		Mean catch per 1 trawl		Abundance, thou. spec.	Bio-mass, t
			Length, cm	mass, kg	spec.	kg		
961	501 - 750	3	34,66	363	80,7	29,3	630,4	228,9
940	751 - 1000	3	37,73	494	256,7	126,9	922,1	456,0
962	751 - 1000	3	37,04	461	148,7	68,6	1332,4	614,6
939	1001 - 1250	3	42,65	730	123,0	89,8	592,2	432,5
963	1001 - 1250	4	41,06	657	107,0	70,3	1050,2	689,9
938	1251 - 1500	3	43,88	780	179,3	139,9	1268,6	989,3
964	1251 - 1500	3	47,67	1128	61,3	69,2	776,9	676,1
Total		22					6572,8	4287,3

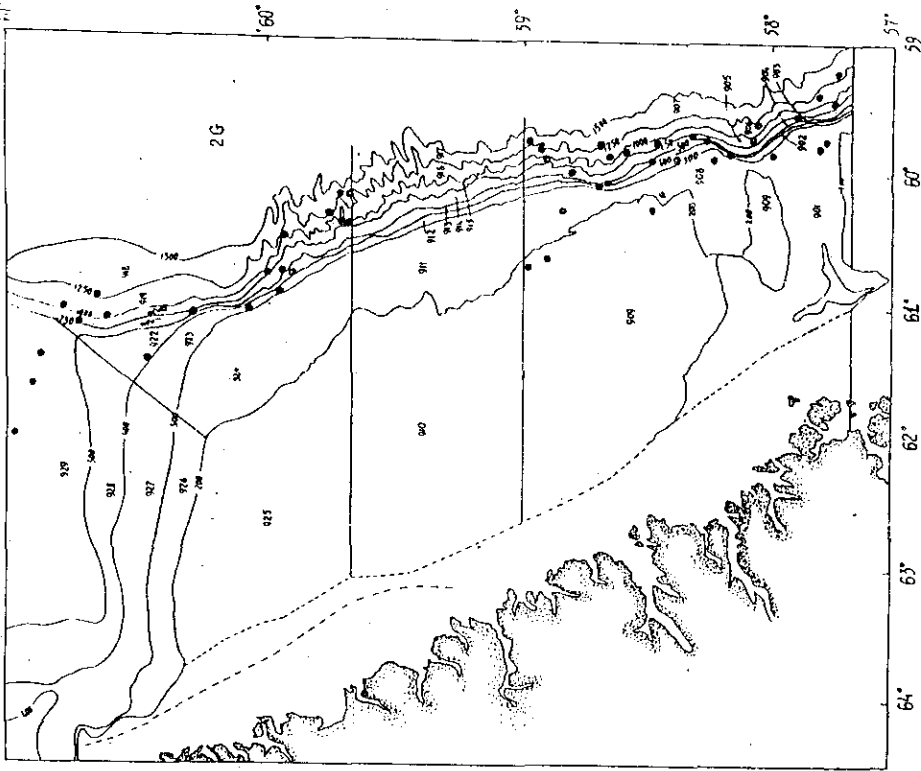


Fig. 2. Stratification and trawling points in 2G
Division. November-December, 1992

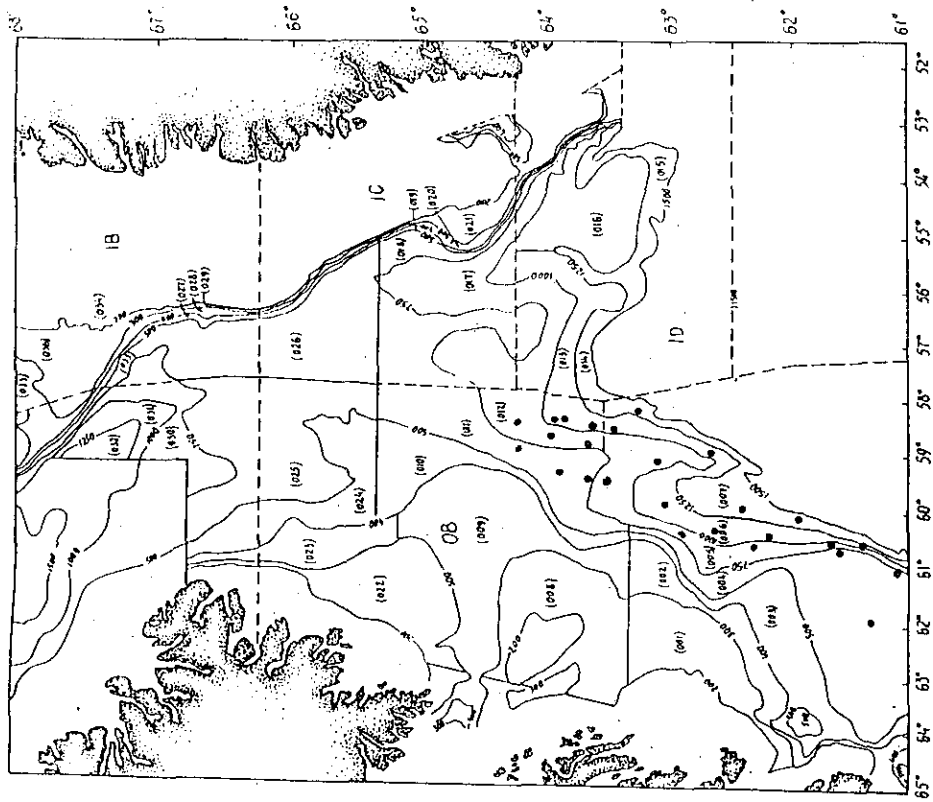


Fig. 1. Stratification and trawling points in OB
Division. November, 1992

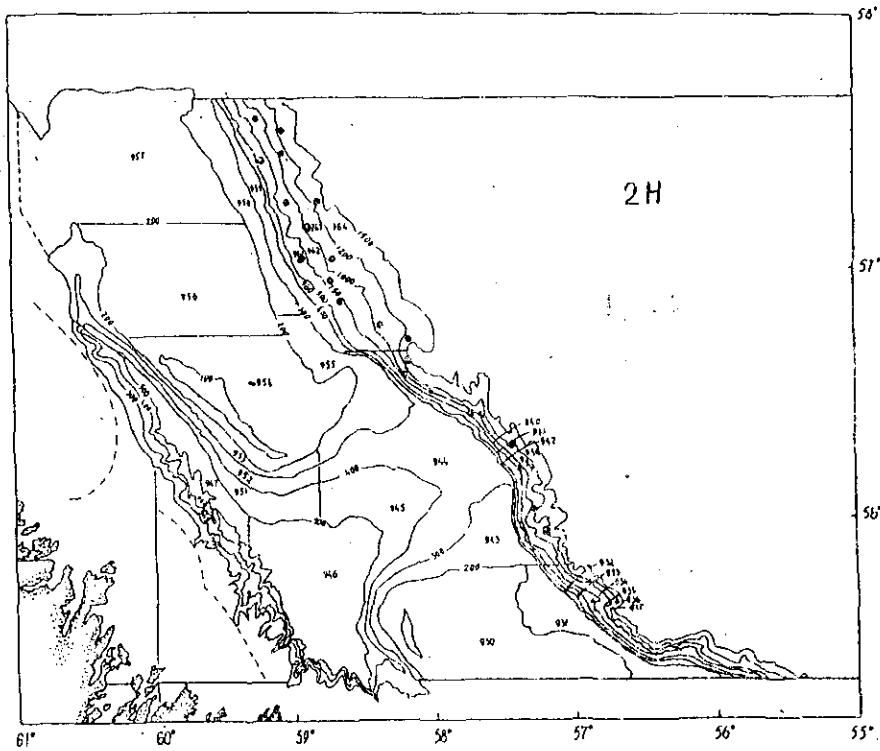


Fig. 3. Stratification and trawling points in 2H Division. December, 1992.

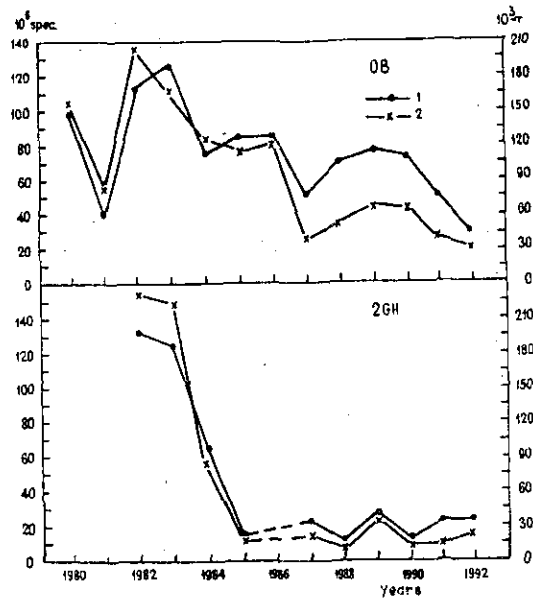


Fig. 4. Abundance (1) and biomass (2) of Greenland halibut in Divs. OB and 2GH by data of trawl Surveys in 1980 - 1992 .

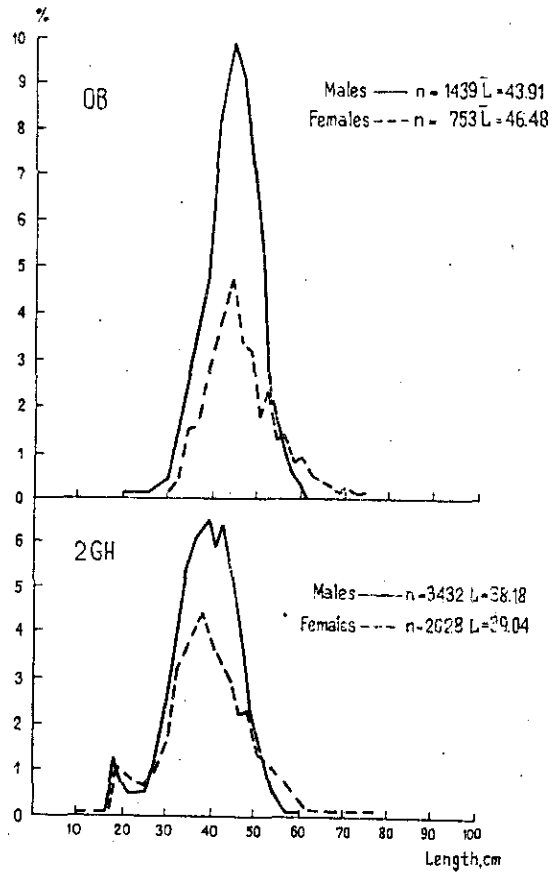


Fig. 5. Greenland halibut length composition in Divs. OB and 2GH. November - December, 1992

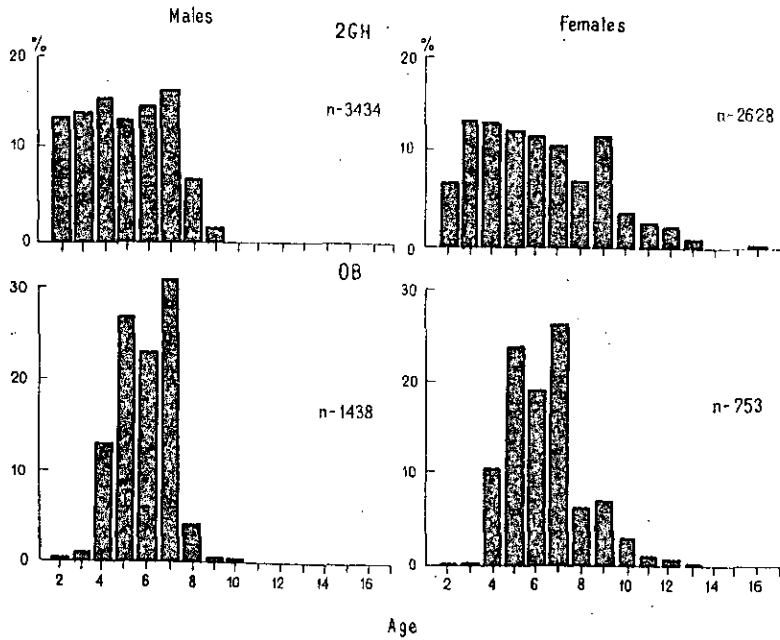


Fig. 6. Greenland halibut age composition in Divs. OB and 2GH. November - December, 1992