



Serial No. N2747

NAFO SCR Doc. 96/72

SCIENTIFIC COUNCIL MEETING - JUNE 1996

Assessment of Greenland Halibut Abundance and Biomass in the
Northern Part of the Flemish Pass by Data of a Russian
Trawl Survey in February 1996

by

K. V. Gorchinsky

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

Introduction

Because of the stock decrease and introduction of a temporal ban for catch of main commercial fish species inhabiting the 200-mile zone of Canada, a great attention is recently paid to fish concentrating outside the zone. Since the 1990's, fishery for Greenland halibut has been successfully developed in the NAFO zone on the continental slope of the Grand Bank of Newfoundland (Divs: 3LNO), as well as on the western slope of the Flemish Cap (3M). In accordance with the estimation of experts, Greenland halibut catch of all countries in this area reached in some years 50-60 thou. t. Since the populational structure and dynamics are poorly studied, it is impossible to prove TAC. Results of a trawl survey for Greenland halibut and specific features of the species distribution in the northern part of the Flemish Pass, as well as fish lengths by strata are presented in the paper.

Material and methods

Halibut abundance and biomass were being estimated by a random stratified method 17 to 24 February, 1996 in the northern part of the Flemish Pass. In total, 11 strata were examined in the depth from 732 to 1463 m (Fig. 1). The survey was carried out by the "Ozernitsa" vessel, 1895 GRT, the main engine capacity - 2400 h.p. Similar to other surveys for the bottom fish carried out by PINRO in the Northwest Atlantic, a bottom trawl of 31.2/27.3 m (vertical opening is 4.0 m, horizontal opening between wings - 14.3 m) was used. Thus, a square of 0.027 miles² has being surveyed per 1 hour at the vessel's speed of 3.5 knots. Catchability coefficient was accepted as 1. The trawl groundrope gear included 15 spherical metallic bobbins 400 mm in diameter, 42 flat rubber bobbins 400 mm in diameter and 30 metallic coils 300 mm long. To keep small fish in a trawl, a codend was equipped with a small mesh-size insertion (12 mm).

In each stratum, 3 trouble-free trawlings have been carried out, all fish were calculated on a deck; length measurements were separated by sex, stages of gonad maturation and stomach fullness were determined, and otoliths were collected to determine the age.

Stratum 531 was excluded from the survey due to difficult ground conditions, which caused a loss of a trawl.

Results

Distribution

Greenland halibut were widely distributed over the surveyed area and occurred in all catches at the depth from 732 to 1.463 m. The largest average catches per trawling hour were obtained in the Sackville Spur area in the depth range of 732-914 m; and on its north-western slope, catches were higher than on the south-eastern slope. Besides, fluctuations of a ratio between males and females in catches, as well as of their length composition, were registered. To our opinion, this fact justifies on mobility and

changeability of concentrations in the mentioned area. If the recruitment of halibut stock dwelling in the Flemish Pass area begins from the north (Divs. 3KL), then the shallow slope, forming a "nose" of the Grand Newfoundland Bank, is a natural barrier, nearby which the initial accumulation of halibut is happened prior to their subsequent distribution in the southern part of the area.

Stock assessment

The survey was only carried out in the northern part of the Flemish Pass in the adjacent areas of Divs. 3L and 3M deeper than 700 m. Abundance was 46.1 mill. spec. and biomass - 31.8 thou. t (Table 1). About 60% of the estimated stock were distributed in Div. 3L, and 40% - in Div. 3M. Since the catchability coefficient was accepted equal to 1, the obtained values can be interpreted as populational indices only. It was the first time, when halibut stock was assessed by a Russian vessel, therefore its results do not allow to make any conclusions on tendencies of the stock dynamics. Due to Russian data, halibut biomass in February 1996 was 12 thou. t and 6 thou. t higher than that of Canada and Japan, correspondingly, assessed in spring 1995 (Bowering and Power, 1995; Yokawa and Koga, 1995). Even at a very careful approach, halibut biomass estimations done in winter 1996 prove to our opinion the stability of the stock and, probably, the biomass growth.

Biological characteristics

Halibut from 20 to 109 cm were registered in catches. Range of males lengths was not big - from 24 to 67 cm, whereas lengths of females fluctuated from 20 to 109 cm. In general, halibut length increased in dependence on the depth. The smallest fish (33.6 cm males and 35.1 cm females) occurred in stratum 745 at the depth of 1281-1463 m. A modal length of halibut in different strata fluctuated due to the same law. The majority of fish in the survey had 34-46 cm length (Fig. 2). Immature halibut predominated in catches, and only 1.5 % of studied fish were at the pre-spawning and spawning stage. The period of spawning lasts as minimum from the end of January to the beginning of March. Due to the survey data, males begin to mature at length of 50 cm, and females - at 53 cm. In total, the number of females was 1.2 times larger than that of males.

The Russian survey of halibut was carried out for the first time in the northern part of the Flemish Pass. Because of the fishery importance of this area and to obtain comparative data, it will be necessary in the future to conduct the survey regularly.

References

- BOWERING, W. R., and D. POWER. MS 1995. Distribution and abundance of Greenland halibut at the continental slope of division 3KLMN based upon Canadian deepwater surveys in 1991, 1994 and 1995. NAFO SCR Doc. 95/52, Ser. No. N2563, 11 p.
- YOKAWA, K. and J. KOGA. MS 1995. Results of a deep water survey in the NAFO Regulatory Area in spring of 1995, with emphasis on Greenland halibut. NAFO SCR Doc. 95/48, Ser. No. N2559, 12 p.

Table 1. Results from the trawl survey for Greenland halibut in Div SLM, February, 1996.

Stratum	Depth, m	Area, sq.miles	No. of tows	Mean catch per 1 valid tow		Abundance, '000	Biomass, tons
				number	weight		
522	732- 914	530	2	106.7	26.2	2093.9	1674.4
741	732- 914	228	2	1138.0	540.9	9999.1	4467.6
745	732- 914	348	2	516.3	175.2	6654.9	2258.1
529	915-1097	499	2	66.0	55.7	1192.9	1006.7
528	915-1097	239	2	329.7	264.3	2997.2	2894.2
742	915-1097	206	2	316.2	219.5	2413.5	1674.7
746	915-1097	292	2	226.0	204.2	4723.0	2954.7
530	1099-1280	1124	2	209.2	177.3	3791.9	7446.6
743	1099-1280	211	2	329.7	315.2	2576.2	2467.2
747	1099-1280	724	2	124.7	114.8	3343.0	3073.3
744	1281-1462	290	2	196.7	227.3	2099.5	2464.0
Total						46135.2	21897.2

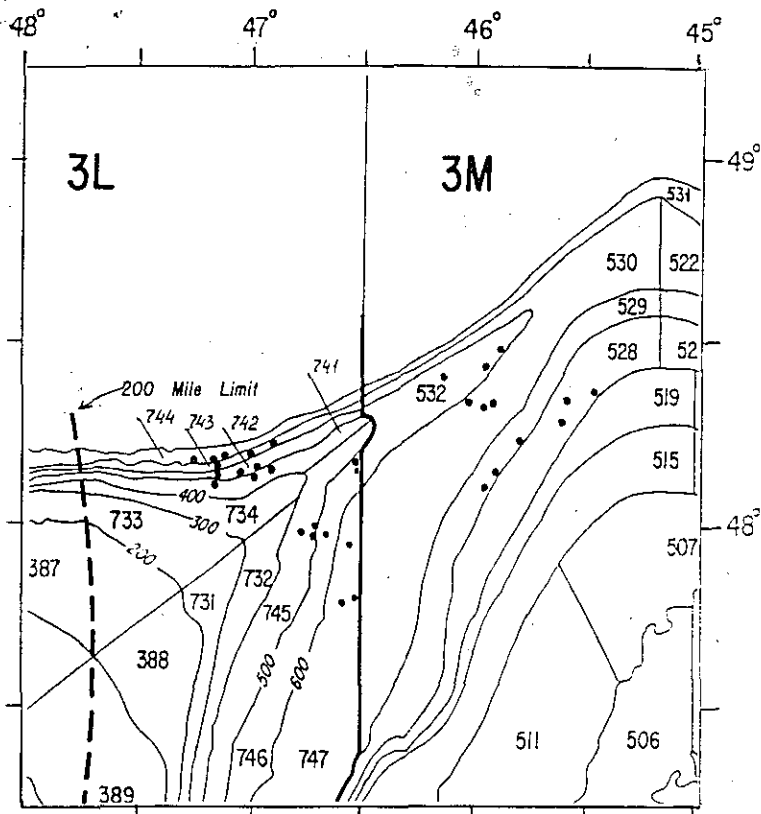


Fig.1. Stratification and trawling points from Greenland halibut directed Russian survey in February 1996 (depth contours in fathoms)

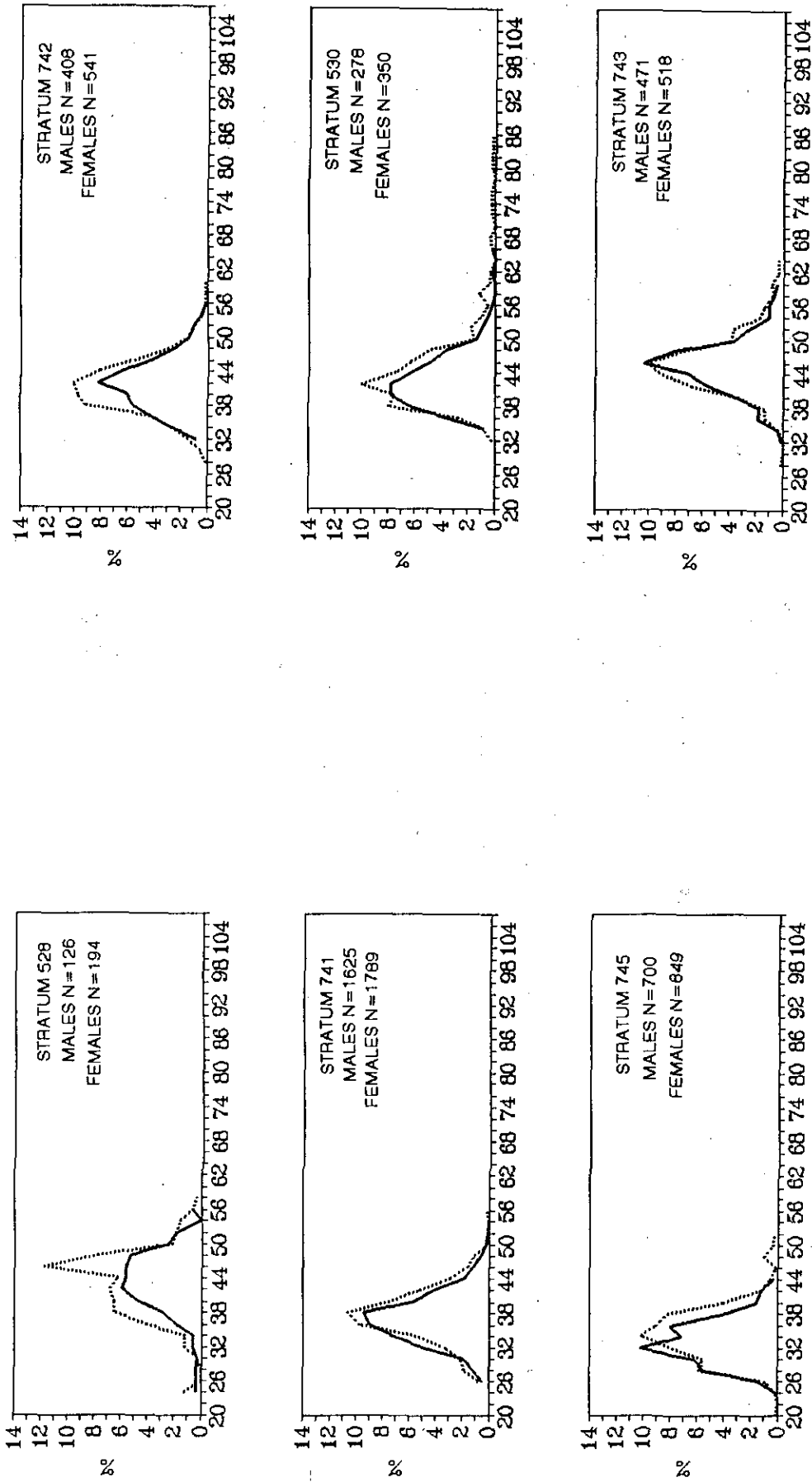


Fig.2. Length distribution by strata of Greenland halibut in Flemish Pass area, February, 1996.

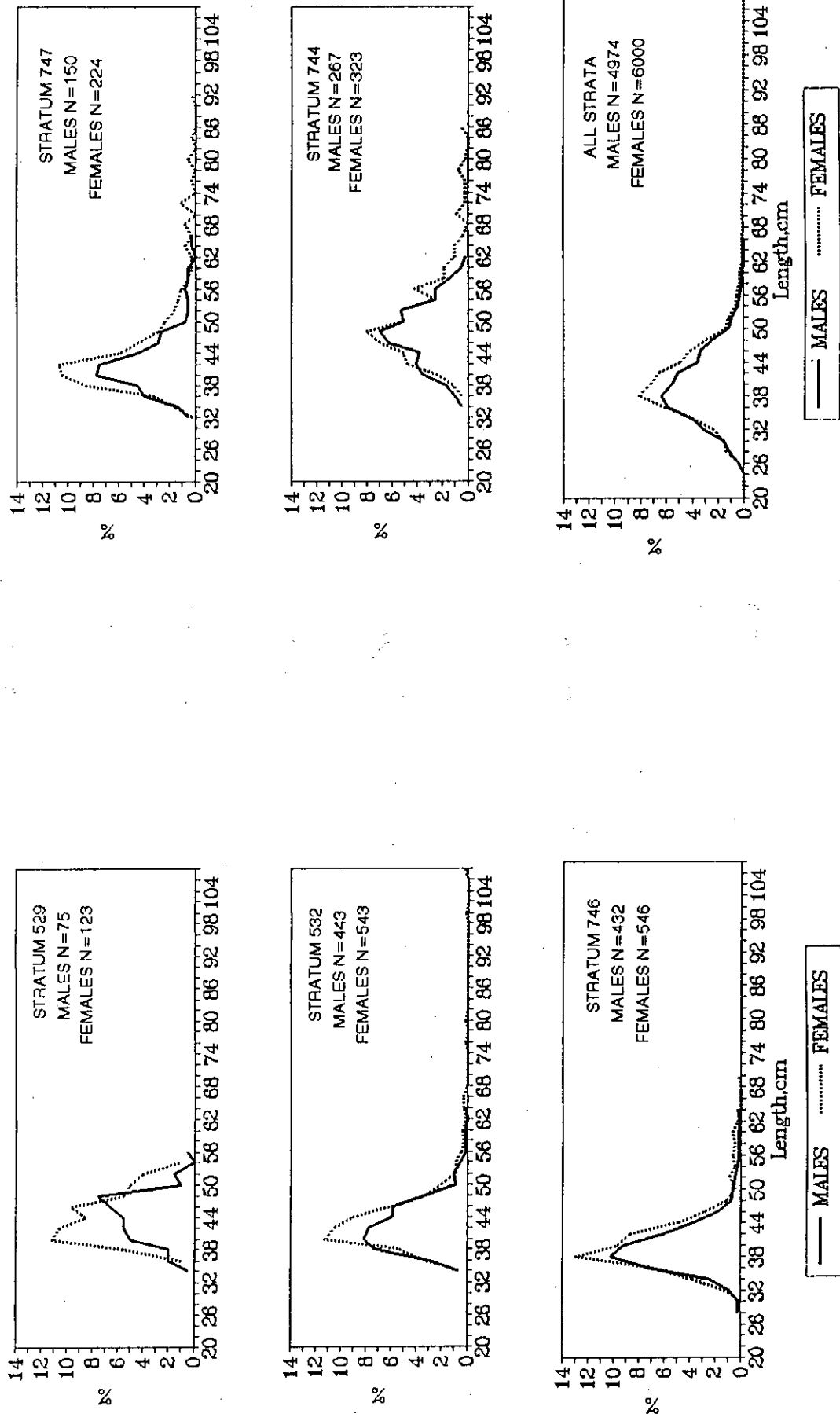


Fig.2. (continued).