

Serial No. 1585Document No: 89ANNUAL MEETING -- JUNE 1964On the size and age composition of the "beaked" redfish in the catches on the Flemish Cap Bank

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The analysis of the fishery for the period from 1957 to 1962 and of the age and size composition of the "beaked" redfish enabled us to reveal that the main reason of change of the composition of catches was the dislocation of the commercial fleet by the fishing depths.

During 3.5 years (from the second half of 1956 to 1959 incl.) trawlers of the BMRT type fished successfully for redfish on the Flemish Cap Bank. The average catch per hour's trawling exceeded 2 metric tons (Table 1). Since 1960, the concentrations of "beaked" redfish became less dense, and the catch per hour's trawling also decreased.

Table 1.

Mean catches by BMRT per hour's trawling
in March-June and total redfish catch on
the Flemish Cap Bank

Years	1957	1958	1959	1960	1961	1962
Catch per trawling hour	2.5	2.3	2.0	1.5	0.9 ^{x/}	-
Catch in th.metric tons	31.6	53.9	52.0	8.2	1.0	2.2

x/ the fishing operations took place in
June-July

The period of redfish fishery was shorter. In 1957, the fishery was conducted from January to December, the periods from January to May and from June to October being most successful, whereas in 1959 the fleet fished mainly prespawning and spawning concentrations (March-May). The shortening of the period of redfish fishery can be explained not only by the decrease in redfish stocks of the Flemish Cap Bank, however that undoubtedly took place, but also by the discovery of areas with more productive fishing of cod, haddock, silver hake and herring. Since 1961 special redfish fishery on the Flemish Cap Bank was discontinued.

Several authors (4,5,6) more and more often suppose that the distribution of redfish of different sizes depends on the depth. In 1962, the Polar Institute initiated the investigations of the distribution of redfish in the Area of the Northwest Atlantic. Some results of these investigations were presented in the paper by P. I. Savvatimsky submitted to the XIII ICNAF Annual Meeting (7). We have no sufficient data available on the seasonal distribution of "beaked" redfish on the Flemish Cap Bank, but the data at our disposal enable us to conclude that the distribution of redfish depth-wise changed in different seasons. The mean length of redfish at great depth decreased in August (7), whereas it increased in April (Table 2).

On the different slopes the size composition of redfish is different at the same depth - on the northern slope of the bank the redfish are smaller-sized. Therefore it had to be assumed that it is impossible to combine the data on size and age composition of the redfish through the whole bank. When analysing the size composition by years the slope, depth and season should be taken into consideration; only in this case it is possible to make conclusion on the changes in the size and in the age of the "beaked" redfish.

Fig. 3 shows the size composition of the catches of S. mentella Travin taken at different depths during the spring period (April) of the years in question. It may be suggested that the changes in the position of the peak of the modal curve by years can be explained by the fact that the fishing fleet operated at different fishing depths. No differences were observed in size composition of redfish taken at the same depth from 1957 to 1960 except in 1960 when the specimens of a new recruitment prevailed in catches (Table 3).

To determine the nature of the changes observed in the size composition of redfish caught, the method of deviations was used at the same depth of 300-400 m.

As in April the size composition of females is subject to fluctuations caused by their spawning migration, only the data on males are given here.

During the first three years, no changes in the size composition of S. mentella Travin were observed on the southern slope of the bank, the fishes of 34-38 cm in length showed positive deviations (the sizes which dominated in the catches at the corresponding depth) (Fig.1). In 1960, however, in this part of the length curve prevailed negative deviations, i.e. in 1960 the fish of the 34-38 cm size-group did not appear in the catches. In 1960-1961, the state of redfish stocks changed. The commercial stock was recruited by new abundant year-classes up to 32 cm in length. Consequently, smaller size-groups prevailed in the commercial catches. This is confirmed by the data on the length composition: in 1960 (Table 3) the peak of the modal curve shifted to 30-34 cm, as against 34-36 cm in 1957-1959. In 1961, though the peak of

Table 2

Distribution of S. mentella Travin depth-wise on the Flemish Cap Bank
in April 1963

Size (cm)	28	30	32	34	36	38	40	42	44	46	48	
300-400	$\frac{0.8^x}{0.8}$	$\frac{3.2}{1.2}$	$\frac{5.2}{11.2}$	$\frac{7.2}{5.6}$	$\frac{3.6}{16.8}$	$\frac{0}{13.6}$	$\frac{0}{18.8}$	$\frac{0}{10.4}$	$\frac{0}{1.6}$		$\frac{20}{80}$	
400-500		$\frac{0.4}{0.2}$	$\frac{2.7}{0.2}$	$\frac{15.6}{2.4}$	$\frac{28.6}{6.6}$	$\frac{11.8}{8.8}$	$\frac{5.0}{11.6}$	$\frac{0.8}{3.7}$	$\frac{0.2}{0.8}$	$\frac{0}{0.6}$	$\frac{65.1}{34.9}$	
500-600			$\frac{2.7}{0.2}$	$\frac{16.2}{2.7}$	$\frac{20.4}{6.8}$	$\frac{13.2}{14.3}$	$\frac{2.5}{9.7}$	$\frac{0.2}{6.2}$	$\frac{0.4}{3.1}$	$\frac{0}{0.8}$	$\frac{0}{0.6}$	$\frac{55.6}{44.4}$

x/ The numerator is the percentage of males, the denominator is the percentage of females.

Table 2 a

Distribution of S. mentella Travin depth-wise
in April, 1963 on the Flemish Cap Bank

Size (cm) Depth (m)	26	28	30	32	34	36	38	40	42	44	46	48	Per cent	
													♂	♀
300-400	1.6	4.4	16.4	12.8	20.4	13.6	18.8	10.4	1.6				20	80
400-500		0.6	2.9	18.0	35.2	20.6	16.6	4.5	1.0	0.6			65.1	34.9
500-600			2.9	18.9	27.2	27.5	12.2	6.4	3.5	0.8	0.6		55.6	44.4

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4
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Table 3

Size composition of S. mentella Travin on the Southern Slope
of the Flemish Cap Bank (according to trawling in April)

Year	Size													
	20	22	24	26	28	30	32	34	36	38	40	42	44	
1957		0.1	-	0.6	2.3	11.1	20.8	32.1	24.5	6.0	2.2	0.3		
1958		0.1	0.4	1.6	3.1	13.9	19.5	38.2	15.3	6.0	1.3	0.6		
1959	0.3	0.3	0.1	0.1	2.5	5.8	22.8	45.4	19.8	2.2	0.6	0.1		
1960			5.2	4.3	16.6	30.0	25.9	14.5	3.1	0.4				
1961	0.3	0.1	1.0	2.1	8.7	11.8	14.8	22.6	24.3	9.0	3.7	1.3	0.3	
1962		0.2	1.6	4.1	4.3	12.5	25.2	32.3	15.5	3.4	0.9			

the modal curve turned to its former position, the percentage of specimens up to 32 cm in length increased. It appeared that an intensive fishery in the preceding years which took large specimens influenced to a certain extent the catches of 1960, but it cannot be considered the main reason; this can be proved by the decrease in size observed in 1958, as well as by a rapid restoration of the mode after 1960.

In 1958, on the northern slope of the bank (Fig. 2) the fish with the length of 32-38 cm were in deficiency, while in 1961 they were in plenty.

Since the redfish fishery was initiated on the Flemish Cap Bank, the age composition of redfish has not changed much. In the catches taken on the southern slope specimens of 13-14 years were prevailing. The portion of fishes at the age over 15 decreased, while that at the age of 12 increased; thus, the mean age decreased.

On the northern slope of the bank the mean age of males also slightly decreased due to the decrease in the percentage of specimens at the age over 13 and the increase in the percentage of specimens at the age of 10-11 years. Evidently, the 1950-1951 year-class which first recruited to the commercial stock of 1960-1961 is responsible for these changes

Hence the change observed in the size and age composition of *S. mentella* Travin catches on the Flemish Cap Bank was more determined by distribution of fishery than by the condition of its stocks.

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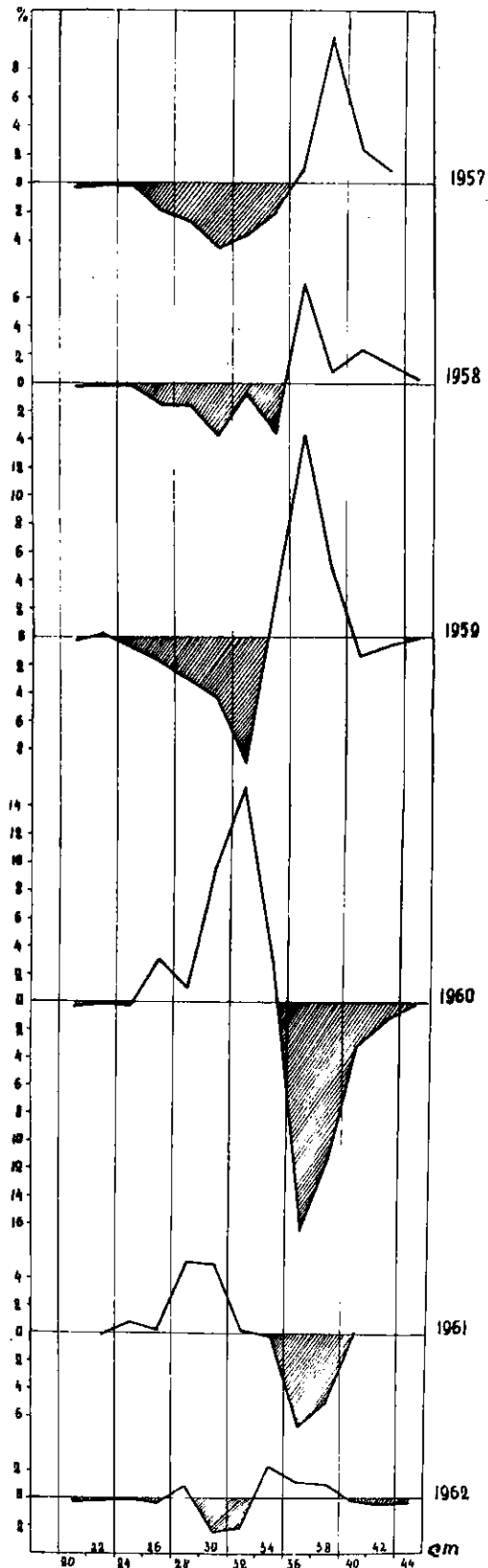


Fig. 1. Comparison of size composition of the southern slope of the Flemish Cap Bank for 1957-1962 (according to the method of deviations).

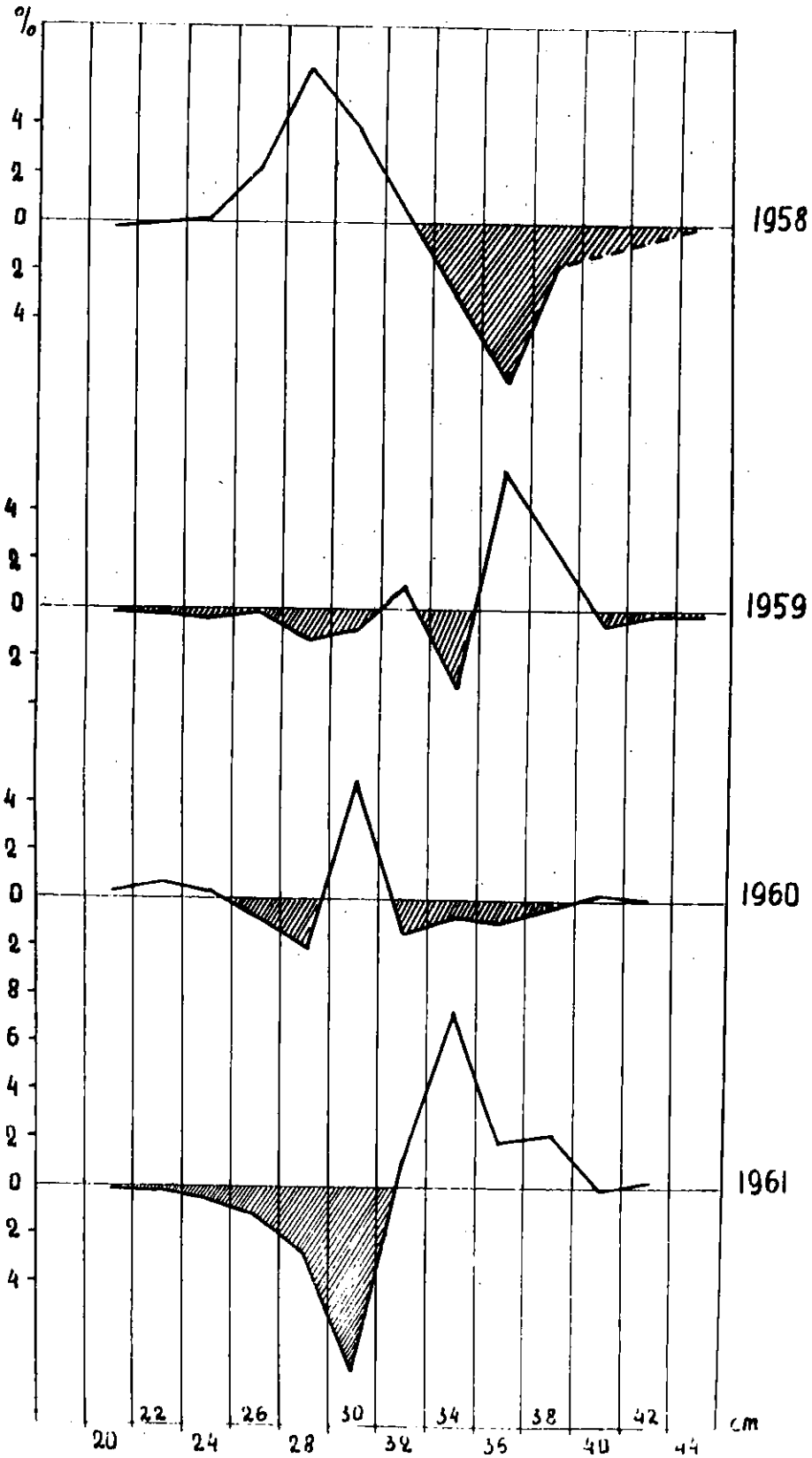


Fig. 2. Comparison of size composition of the " beaked " redfish on the northern slope of the Flemish Cap Bank for 1958-1961 (according to the method of deviations).

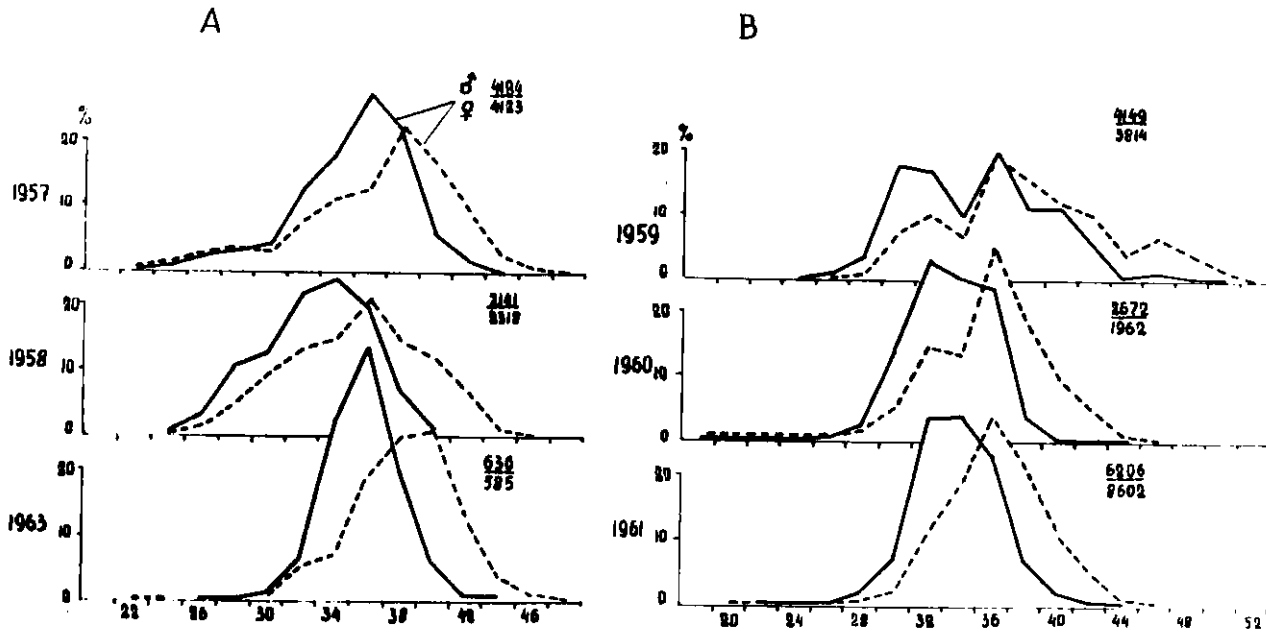


Fig.3. Size composition of catches of the " beaked" redfish on the Flemish Cap Bank in April: a) on the southern slope, b) on the northern slope.