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The Assessment of Total Allowable Catch of the Georges Bank
Red Hake for 1978

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The additional information, necessary for assessment of possible catch in 1978, as usually included preliminary catch statistics and age composition data from commercial catches. Unlike the previous years, no abundance indices were available from the last autumn survey of demersal fishes at Georges Bank. The data from the surveys made RV BELOGORSK in 1975 and 1976 were uncomparable due to considerable differences in the dates of these surveys. The distribution of catches by age groups was made with regard for the fact, that the quota allotted to the USSR for 1976 (19 thous.t.) was fulfilled almost wholly, while the red hake catches by other countries were insignificant. The assessment of total allowable catches was made by the virtual population method (Shumakher, 1970) and according to the scheme proposed by the author of this paper (Rikhter, 1974). For assessment of the recruitment the abundance data on the two year olds determined by the virtual population method, and the abundance indices for the youngs of the year including those for 1975 were used (table 1).

The 1974 year class was assumed to be equal to the 1963 year-class, the richest one for the period of observation (321 mln specimens).

The 1975 and 1976 year classes were estimated as the arithmetical mean abundance of the 1968-1973 year classes.

In estimation by virtual population method it was assumed, that the total catch in 1977 would amount to about 16 thous. tons. The natural mortality rate (M) was assumed 0.6 for two year olds and 0.4 for the other age-groups. The results of calculations are presented in table 2.

According to these calculations the total allowable catch of red hake at Georges Bank will amount to about 20 thous. tons in 1978.

The forecasting of possible catch in 1978 made according to the author's scheme was also based on the above estimates of the 1972-1976 year class abundance. As compared with the similar last year calculations (Rikhter, 1976), most considerable changes occurred in the 1972 year class estimate. The data on the average exemption (in per cent) of the year classes by age-groups were also corrected. The catch (thous. tons) taken from the year class during the whole period of its exploitation was recalculated to specimen numbers ^{of} means of the average stratified weight, with subsequent determination of the catch by age-groups. The results of these calculations are given in table 3.

Thus, the value of possible yeild in 1978 according to the given calculation scheme amounted to 25 thous. tons. Taking into account the fact, that the virtual population method is somewhat more precise, as well as the fact of the presence of some uncertanties in the 1976 year class abundance definition, the total allowable catch of 20 thous. tons is recommended for 1978.

References

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3. SCHUMACHER A., 1970. Bestimmung der fischerellichen sterblichkeit beim Kabeljaubestand vor Westgrönland, Ber.Dt.Wiss.Komm.Meerfersch. 21, H 1-4, p. 248-259.

Table 1

Indices used for assessment of red hake recruitment at Georges Bank

Year classes	:1963:	:1964:	:1965:	:1966:	:1967:	:1968:	:1969:	:1970:	:1971:	:1972:	:1973:	:1974:	:1975
Abundance of two year olds (10 ⁶)	321	188	110	214	222	266	250	241	233	222	164	-	-
Abundance indices for the youngs of the year	-	-	-	-	-	0.02	6.2	1.8	5.4	1.9	8.5	20.6	3.0

Table 2.

The stock size and catch of red hake in Subdivision 5Ze

Stock size in numbers by age-groups (10⁶)

Years	A g e					Two year olds and older	
	2	3	4	5	6	abundance (10 ⁶)	weight (thous. tons)
1971	250	144	77	49	3	523	115
1972	241	129	85	46	29	530	89
1973	233	113	56	23	14	439	73
1974	222	118	51	15	5	411	58
1975	164	116	68	25	6	379	58
1976	321	78	64	30	5	498	68
1977	229	144	26	21	10	430	72
1978	229	114	59	11	9	422	72
Catch in numbers by age-groups (10 ⁶)							
1971	10.4	15.1	7.4	4.3	1.4	38.6	8.9
1972	27.7	38.3	43.1	20.8	12.4	142.3	32.4
1973	13.7	31.1	28.6	12.5	6.1	92.0	24.6
1974	8.4	13.8	10.9	5.6	2.3	41.0	9.5
1975	15.9	16.8	19.4	15.0	2.5	69.6	14.0
1976	15.8	33.2	27.2	12.6	2.2	91.0	19.0
1977 ¹⁾	16.5	45.2	8.2	6.6	3.1	79.6	16.0
1978 ²⁾	31.5	48.4	25.0	4.7	3.8	113.4	21.5

- 1). The total catch in 1977 (16 thous. tons) is taken at F=0.1 for the two year olds, and F=0.47 for the subsequent age-groups.
- 2). In estimating the catch for 1978 the value of F was assumed 0.2 for two year olds and 0.7 for the subsequent age-groups.

Table 3

The approximate estimate of the total allowable catch for Georges Bank red hake for 1978

Age Year class	Per cent of each age-group in catches	Yield in the whole period of year class exploitation		Catch of each age-group in 1978	
		Weight (thous. t.)	Number (10 ⁶)	Weight (thous. t.)	Number (10 ⁶)
2/1976	24.3	25.0	107	3.1	26.0
3/1975	34.7	25.0	107	6.8	37.0
4/1974	26.2	35.0	150	10.5	39.3
5/1973	9.9	17.9	77	2.5	7.6
6/1972	4.9	24.2	104	2.1	5.1
Total	100.0			25.0	115.0