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AGE DISTRIBUTIONS FOR SPAWNING CAPELIN 1954-1984
A REVIEW OF SOME SELECTED LITERATURE

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ABSTRACT

This paper gives a brief review of published information about the age distributions of maturing and spawning capelin in the years 1954-84. The results are presented in a table and a figure, and discussed.

INTRODUCTION

Both Russian and Norwegian scientists carry out monitoring of the capelin spawning stock as part of their regular research programs, and the results are presented in a number of papers and reports. Only a small selection of the Russian reports have been available to me, while I probably have been able to check all relevant Norwegian reports.

The main problem in compiling a review like this, is to find information that can be compared, in order to describe reliably the differences from year to year. Some examples will show the problem:

Although most authors give the age composition for both sexes together, and often separately as well, one author (OLSEN 1968) only gives the age composition for each sex separately without giving the number of fish examined.

In other cases, age composition is given for commercial catches by month, without distinguishing between mature and immature fish (for example ANON. 1978).

Some reports refer to data from research vessel catches only, while others use material from commercial catches. As it is quite possible that research vessel catches have age- and size selections that are different from those of commercial catches, this is another possible source of "incomparability".

The material given below is a selection of what I have found - the main criterion for selection being to get "something" for each year in question.

MATERIAL

PROKHOROV (1968) gives information about age composition for spring spawning capelin 1954-63. The material was obtained both from research vessels and from regular fishing vessels.

OLSEN (1968) presents data on the age distribution for spawning capelin in the years 1961-65, but only for males and females separately.

KOVALYOV and BENKO (1970) present data on the age compositions of spawning capelin during the years 1966-69.

MONSTAD (1971) gives age distribution of spawning capelin from the coast of Finnmark during winter and spring for the years 1969 and 1970. Only his data for 1969 are used here.

DRAGESUND, GJØSÆTER and MONSTAD (1971) give age composition for 1970 and 1971. Their data for 1970 are very similar to those of MONSTAD (1971) but based on a larger material.

BLINDHEIM and MONSTAD (1972) give age composition for 1972.

JAKOBSEN and NAKKEN (1973) give age composition for the maturing capelin in February-March 1973.

For the years 1974-83 the age distribution in commercial catches is available on a monthly basis through the reports from the USSR/Norwegian Working Groups (ANON. 1978, 1979, 1980, 1982, 1983). The data for March have been used here to represent the age distribution in the spawning stock for those years.

DISCUSSION

As already touched on in the introduction, two questions will arise quickly when trying to compare the age compositions given in Table 1:

Are the percentages representative for the total spawning stock?

Are the results from different years really comparable?

PROKHOROV's (1965) material comes from Russian research- and commercial vessels which, presumably, were mostly fishing in the southeastern part of the Barents Sea during that period. OLSEN (1968) writes nothing about how his age distributions have been obtained. KOVALYOV and BENKO (1970) give data for the years 1966-69 from commercial catches, which all seem to have been taken fairly close to the Murman coast. MONSTAD's (1971) material from 1969 is from the coast of Finnmark only, and is thus not directly comparable with the material of KOVALYEV and BENKO. DRAGESUND, GJØSÆTER and MONSTAD's (1971) data are from commercial and research vessel catches. The age distributions for 1972 and 1973 (BLINDHEIM and MONSTAD 1972, JAKOBSEN and NAKKEN, 1973) are based on research vessel catches only. The material for the years 1974-1983 is based on Russian and Norwegian research vessel- and commercial catches (ANON. 1978, 1979, 1980, 1982, and 1983), but in order to make sure that only mature capelin is included, only the age distributions from March have been used in Table 1.

Based on our present knowledge of the variability in geographical extent and timing of the spawning migration, it is probable that in most years only part of the spawning stock has been included in the sampling.

The numbers of fish used to establish the age distributions vary enormously, from 61 in 1956 to 6215 in 1971.

It is known that during this period there has been considerable uncertainty about whether the innermost ring on the otoliths is a "larval ring" or not and whether it should be counted (see for example HAMRE, 1977). This is likely to have influenced the age readings, thus introducing another element of uncertainty.

With these rather unaccountable sources of uncertainty, considerable restraint must be exercised in the use of the data.

Even with such reservations, however, Table 1 shows considerable variations in the age composition between different years. This shows even better in Fig. 1, which gives a rough graphic representation of the data in Table 1. In 1954, 1957, 1958, 1965, 1966, and 1967, three years old capelin seem to have dominated in the spawning stock. In 1966 and 1967 it even seems that two years old capelin made up one third of the stock. In 1955, 1961, 1962, 1963, 1964, 1969, and from then on (at least until 1984) it seems that four and five years old capelin dominated in the spawning stock.

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Table 1. Percentage age distributions for maturing and spawning capelin during the years 1954 - 83.

Year	Ages					No. of specimens	Author
	2 %	3 %	4 %	5 %	6 %		
1954	1.6	78.1	19.9	0.4	0	238	PROKHOROV (1965)
1955	0	1.7	56.3	41.4	0.6	174	"
1956	0	52.4	42.7	4.9	0	61	"
1957	5.1	77.2	17.2	0.5	0	611	"
1958	0	88.8	11.2	0	0	98	"
1959	2.2	68.8	29.0	0	0	224	"
1960	0	40.5	58.8	0.7	0	973	"
1961	0.4	14.3	83.6	1.7	0	699	"
" *	0	3.0	94.4	2.7	0	-	OLSEN (1968)
1962	0	12.4	67.0	20.4	0.2	917	PROKHOROV (1965)
" *	0	5.2	65.4	29.2	0.2	-	OLSEN (1968)
1963	0	4.9	90.0	5.1	0	752	PROKHOROV (1965)
" *	0.2	5.0	92.3	2.6	0	-	OLSEN (1968)
1964 *	0.2	4.2	52.6	43.1	0	-	"
1965 *	0.9	91.0	7.8	0.3	0	-	"
1966	32.3	65.3	4.4	0	0	300	KOVALYOV and BENKO (1970)
1967	33.8	57.4	8.8	0	0	591	"
1968	2.6	35.7	61.7	0	0	863	"
1969	0.6	42.9	56.5	0	0	817	"
"	0	25.9	73.8	0.3	0	3380	MONSTAD (1971)
1970	0	29.2	70.2	0.6	0	5304	DRAGESUND, GJØSÆTER and MONSTAD (1971)
1971	0	4.3	91.1	4.7	0	6215	"

(continued)

Table 1 (continued).

Year	2 %	3 %	Ages 4 %	5 %	6 %	No. of specimens	Author
1972	0	9.6	65.1	25.4	-	2450	BLINDHEIM and MONSTAD (1972)
1973	0	5.8	74.2	20.0	0	1837	JAKOBSEN og NAKKEN (1972)
1974	0.3	10.0	65.1	24.2	0.4	-	ANON. (1978)
1975	0.1	9.9	79.3	10.4	0.3	-	"
1976	0.1	4.8	57.8	37.0	0.3	-	"
1977	0	5.5	58.5	32.2	3.9	-	"
1978	0	17.5	53.9	23.9	4.7	-	ANON. (1979)
1979	0	22.4	62.9	13.7	1.1	-	ANON. (1980)
1980	0	4.0	87.4	8.3	0.4	-	"
1981	2.6	6.0	61.7	27.7	2.4	-	ANON. (1982)
1982	3.0	37.2	46.5	13.1	0.2	-	ANON. (1983)
1983	0	21.2	63.9	14.1	0.9	-	"
1984	0	20.8	63.8	14.6	0.8		ANON. (1984)

* OLSEN (1968) only gives percentages for each sex separately. The values in the table have been calculated as the mean of the values given for males and females.

Fig. 1.

Age distribution of the spawning stock 1954-1984, according to the data in table 1. For those years where two sets of age distributions are given (1961,1962,1963 and 1969), the first one has been used.

Legend:
▬ 1.0 - 24.9 %
▬ 25.0 - 49.9 %
▬ 50.0 - 74.9 %
▬ 75.0 - 100.0 %



