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NEW DATA ON HUNTING OF HOODED SEALS
AND AGE COMPOSITION OF CATCHES IN SOUTH GREENLAND

by

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ABSTRACT

In South Greenland 214 and 200 jaws of hooded seals were sampled in 1972 and 1973, respectively. The samples are compared with hunting statistics for 1970 -72, and sex and age composition of the samples are presented and discussed. Mortality rates calculated on the basis of the new samples are compared with previous estimates.

I. Introduction

Some general features of the catch of hooded seal in South Greenland, especially in 1971, was described in a previous paper (Res.Doc. 72/85), in which also results of age determination of material collected up to 1971 were presented.

In the present paper the hunting seasons 1972 and 1973 will be described and preliminary results of age determination of material of hooded seals collected in South Greenland these two years will be discussed.

II. Material

The arrangements for collecting material were the same as previously described for the 1971 sample, with the difference that only lower jaws, not reproductive organs were asked for. Requests were directed to the town Nanortalik and the outposts Sydprøven and Qagssimiut, and the results were as follows:

Locality	<u>Number of jaws collected</u>											
	1971				1972				1973			
	♀♀	♂♂	?	total	♀♀	♂♂	?	total	♀♀	♂♂	?	total
Qagssimiut	16	31	-	47	5	67	22	94	5	42	42	89
Julianehåb	5	12	-	17	-	-	-	-	-	-	-	-
Sydprøven	38	62	1	101	26	68	1	95	-	-	-	-
Nanortalik	52	17	-	69	10	13	2	25	37	68	6	111
SOUTH GREENLAND	111	122	1	234	41	148	25	214	42	110	48	200

The 1972 samples of canine teeth were cut transversely and imbedded as the previous samples, but the 1973 sections were read directly under microscope without imbedding.

Previous age determinations were done by two persons independently, and in case of doubt the sections were read and discussed several times. This has not yet been possible for the 1972 and 1973 samples, and the results presented in Table 1 and Fig. 2 must be regarded as preliminary.

III. Results

1. Hunting period in South Greenland, 1970 - 1973.

On the basis of the hunting statistics it is possible to compare the course of hunting of hooded seal in South Greenland in the years 1970-1972, and the 1973 sample of jaws can give an idea of the circumstances this last year (Fig. 1).

The difference between the various years consists essentially in the size of the catches. In 1970 the total catch for South Greenland was little more than 600 hooded seals, slightly lower than the mean for the preceding years. In 1971 around 850 hooded seals were caught in South Greenland, and in 1972 the output went up to about 1600 animals, which is the largest number taken in this area during the last 25 years. Hunting statistics for 1973 are not yet available, but judging from the samples the catch seems to have been above the average also this year.

The seasonal distribution of the hunting activity does not, however, seem to differ essentially between the four years in question. In the northern part of the area (Qagssimiut-Narssaq-Julianehåb) the hunting began in late April, reached a maximum around the middle of May, and ceased almost totally in the beginning of June. One and a half month later there was again some hunting, apparently a bit later in 1972 than in the preceding years.

In the southern part of the area the catch was insignificant in April and the first half of May, increased suddenly in the final half of this month and the first days of June, and decreased just as markedly around mid-June. The catch remained on a low level the following two months with a more or less distinct peak around the end of July.

The samples from 1973 indicate that the hunting cycle this year has been similar to that found for 1970-1972.

2. Sampling activity and hunting cycle.

In my previous paper I discussed the value of the 1970 and 1971 samples as a representation of the catch in South Greenland the years in question. As preliminary figures for the catch statistics are now available, it is possible to comment further on this subject.

Fig. 1 shows that the 1970 material (total 42 specimens) can give only a crude estimate of the composition of the catches, as the samples from Qagssimiut, Julianehåb and Nanortalik account for no more than c. 30%, 20% and 5% of the catches, respectively. The 1971 material gives a much better

representation: In Qagssimiut c. 55% of the catch was sampled, in Julianehåb less than 20% (giving, however, a fairly good picture of the peak of the catch), and in Sydprøven and Nanortalik a sampling efficiency of 40-50% was reached, in the former place particularly covering the initial phase of the hunting maximum, in the latter place the final phase.

In 1972 too, the sampling result from Qagssimiut was good (54%), whereas it was less satisfactory from Sydprøven (20-25%, particularly from final part of the hunting maximum), and too poor from Nanortalik (6-8% of the catch).

Contrary to this, the samples from 1973 seem to give fairly good representation of the catch in Nanortalik as well as in Qagssimiut. Material from other localities has not been received the last year.

In consequence of the type of hunting in South Greenland a sampling efficiency of 40-50% of the catch is considered very near the best possible result - and may also be sufficient for the purpose. Several samples from the various localities may thus give the optimum expression of the composition of the catch on the locality in question, and an acceptable picture of the catch of hooded seals in South Greenland as a whole.

3. Sex ratios.

The hunters were asked to report the sex of the animals. This was done for almost all animals in the 1971 sample (99%), but in 1972 and 1973 for only 88% and 76%, respectively. Whereas the sex ratio in the total material from 1971 was almost equal (47% ♀♀), the females were reported to account for only 19% and 21% in the last two years. As mentioned before (Res.Doc. 72/85) it is possible that females were represented in the 1971 samples with higher percentages than they actually occurred with in the catches, as a consequence of a higher payment for mature females.

It may also be born in mind that the above mentioned statements of sex ratios are only based on the records of the hunters. It is beyond any doubt that they can record the sex of a hooded seal accurately, but is not quite certain that they actually do so.

Some general features may, however, be deduced from the material. In all three years the females accounted for a minor proportion of the samples from the northern localities (max. 34% in 1971) than of the samples from Sydprøven and Nanortalik. On the last mentioned localities the percentage of females shows a tendency to increase during the hunting period.

This seems to indicate, that most females arrive to the hunting areas of South Greenland later than the males, which is in good agreement with the statement that the percentage of adult females on the Front ice increases during the whelping period (Sergeant 1974, MS in prep.). The samples from South Greenland suggest that also immature females accomplish their supposed migration to the moulting areas in the Denmark Strait at so late a time, that they will only be object to hunting in the southernmost parts of South Greenland, and probably also on a route that keeps most of them away from the hunting areas.

4. Age composition.

The age composition of the total samples for 1972 and 1973 agrees fairly well with the total sample for 1971 (Table 1 and Fig. 2). Youngs of the year are almost totally absent in the catches in South Greenland (reexamination of two sections from 1971, at first aged 0+, showed that they actually were from one year old animals). One year old animals are also very few except in the 1973 sample, where they constitute 9% of the sample. 2-5 years old animals account for 51% and 37% in 1972 and 1973, respectively (44% in 1971), and 6-10 years old for 32% in the two last years (33% in 1971).

Comparison of samples from different localities shows variations. The 1972 and 1973 samples from Qagssimiut have both relatively many old seals, whereas the 1971 and 1972 samples from Sydprøven contain rather few and are dominated by age-groups 2-9. The 1971 and 1973 samples from Nanortalik are also very much alike, although two age groups are extraordinary strongly represented in the latter. The samples from Qagssimiut 1971, Nanortalik 1972 and the one from Julianehåb (1971) are so small that it is difficult to say, whether they show age compositions similar to other samples from the same areas or not.

These variations between age composition of catches from different localities should be taken into account, when the combined samples for South Greenland as a whole are compared. It is thus probable that the age-groups 2-9 would have been better represented in the combined sample for 1973, if material from Sydprøven had been obtained.

5. Estimates of mortality rates.

As for the 1971 sample the total annual mortality rates have been estimated using a linear regression of plots of age group strength.

For the combined 1972 sample a mortality rate of 16.7% ($Z = 0.183$) was found for age-groups 3-14. From the combined 1973 sample a mortality rate of 10.7% ($Z = 0.113$) was calculated for age-groups 3-14.

Calculation of mortality rates for males of age-groups 4-14 gives values of 18.2% ($Z = 0.201$) and 10.8% ($Z = 0.114$) for the 1972 and 1973 samples, respectively. Mortality rates for females alone were not calculated, as the number of females in the samples from the last two years were too low.

The low values for mortality rates found for the 1973 sample is probably in part due to the fact, that samples from the Sydprøven area (with a supposed dominance of age-groups 2-9) was not obtained.

IV. Discussion

For the 1971 combined sample a mortality rate of 12.9% was found for age-groups 3-15. For females of age 3-15 and males of age 2-16 mortality rates of 14.3 and 11.6% respectively, were calculated. Øritsland (1973) used the material for a recalculation and found values of 13.0% for females of age 4-11, 12.5% for males of age 4-10 and 12.9% for combined sexes of age 4-13. Using another method (mean ages of fully recruited age groups) he

calculated mortality rates of 17.5, 18.2 and 18.1% for females, males and combined sexes, respectively.

The available data from South Greenland thus give a rather wide range of total annual mortality of hooded seals (10.7 - 18.1% for combined sexes, 10.8 - 18.2% for males and 13.0 - 17.5% for females). For several reasons the lowest values are thought to be less reliable, and the best estimates based on the South Greenland material will be around 14-18%.

Øritsland (1973) has calculated mortality rates on basis of samples from Newfoundland-Labrador from 1964 to 1972, and concludes that the total annual mortalities are about 16% for breeding females (older than 6 years) and about 23% for breeding males (older than 10 years).

These values seem to be somewhat higher than the values found in the South Greenland material. One reason for this difference may be that younger age groups are weaker represented in the whelping areas and thus are less exposed to hunting, which would give a minor total mortality for these age groups than for older animals, if the natural mortality is the same or only slightly higher.

However, another explanation may seem more probable. According to Sergeant (1974, MS in prep.) a third whelping area of hooded seals was found in the Davis Strait in 1974. If this breeding area proves to be of permanent character and has been so for years, it is most probably that the hooded seals occurring in Greenland waters come from both breeding areas. If so, samples from the mixing populations in Greenland waters are likely to show lower estimates of total mortalities than samples from the exploited whelping area off Newfoundland-Labrador.

As pointed out above, the 1971-73 samples are supposed to represent the catches of hooded seals in South Greenland rather well, and it is hardly possible to improve the sampling results very much. From the available and future samples it is thus possible to describe the composition of the catch of hooded seals in Greenland satisfactorily.

Another question is, whether it is possible from this information to deduce anything about the state of the stocks of hooded seals, e.g. on mortalities. If Greenland catches are recruited from two (or three) separate stocks, it will be difficult ^{to} interpret results obtained from these catches, unless the degree of mixing of stocks in Greenland waters is known for each particular year.

V. References

- Kapel, F.O. Age analysis of hooded seals in South Greenland. ICNAF Res. 1972 Doc. 72/85, Serial No. 2818.
- Sergeant, D.E. A rediscovered stock and stock relationships of hood seals. 1974 MS, in prep.
- Øritsland, T. and T. Benjaminsen. Sex and age composition and mortality of hooded seals at Newfoundland. ICNAF Res. Doc. 73/120, Serial No. 3092.

Table 1. Age samples of hooded seals, South Greenland.

Age	1971					1972					1973				
	♀♀ No.	♂♂ No.	NK No.	Total No.	%	♀♀ No.	♂♂ No.	NK No.	Total No.	%	♀♀ No.	♂♂ No.	NK No.	Total No.	%
0.2	-	-	-	-	-	-	-	-	-	-	-	1	-	1	0.5
1.2	1	5	-	6	2.6	-	2	1	3	1.4	3	11	3	17	8.5
2.2	6	19	-	25	10.8	5	18	1	24	11.2	7	8	2	17	8.5
3.2	19	8	-	27	11.6	11	16	2	29	13.6	4	12	4	20	10.0
4.2	12	15	1	28	12.1	6	22	-	28	13.1	6	9	5	20	10.0
5.2	12	11	-	23	9.9	5	22	1	28	13.1	3	11	3	17	8.5
6.2	10	6	-	16	6.9	5	14	3	22	10.3	1	6	5	12	6.0
7.2	7	14	-	21	9.1	3	13	1	17	7.9	4	7	2	13	6.5
8.2	8	4	-	17	7.3	2	5	4	11	5.1	4	4	4	12	6.0
9.2	5	7	-	12	5.2	2	8	1	11	5.1	1	16	3	20	10.0
10.2	5	5	-	10	4.3	-	5	2	7	3.3	1	2	3	6	3.0
11.2	5	1	-	6	2.6	1	5	1	7	3.3	1	4	2	7	3.5
12.2	3	4	-	7	3.0	1	4	1	6	2.8	2	3	2	7	3.5
13.2	3	4	-	7	3.0	-	3	3	6	2.8	-	5	3	8	4.0
14.2	5	6	-	11	4.7	-	4	1	5	2.3	1	3	2	6	3.0
15.2	2	3	-	5	2.2	-	1	-	1	0.5	-	2	1	3	1.5
16.2	-	3	-	3	1.3	-	1	-	1	0.5	1	2	2	5	2.5
17.2	1	-	-	1	0.4	-	1	1	2	0.9	1	1	-	2	1.0
18.2	3	1	-	4	1.7	-	1	1	2	0.9	1	-	-	1	0.5
19.2	-	1	-	1	0.4	-	2	-	2	0.9	-	1	2	3	1.5
20.2	1	-	-	1	0.4	-	-	-	-	-	1	2	-	3	1.5
21.2	1	-	-	1	0.4	-	-	1	1	0.5	-	-	-	-	-
22.2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23.2	-	-	-	-	-	-	1	-	1	0.5	-	-	-	-	-
Sum	109	122	1	232	99.9	41	148	25	214	100.0	42	110	48	200	100.0
%	47.0	52.6	0.4	100.0		19.2	69.2	11.7	100.1		21	55	24	100	

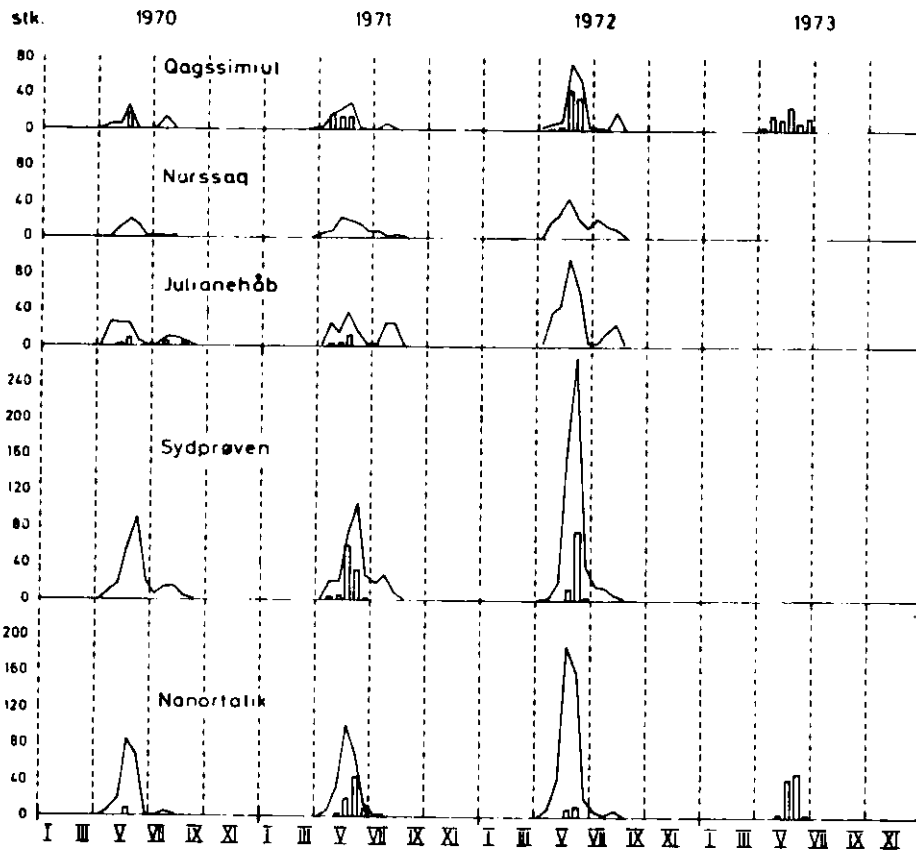
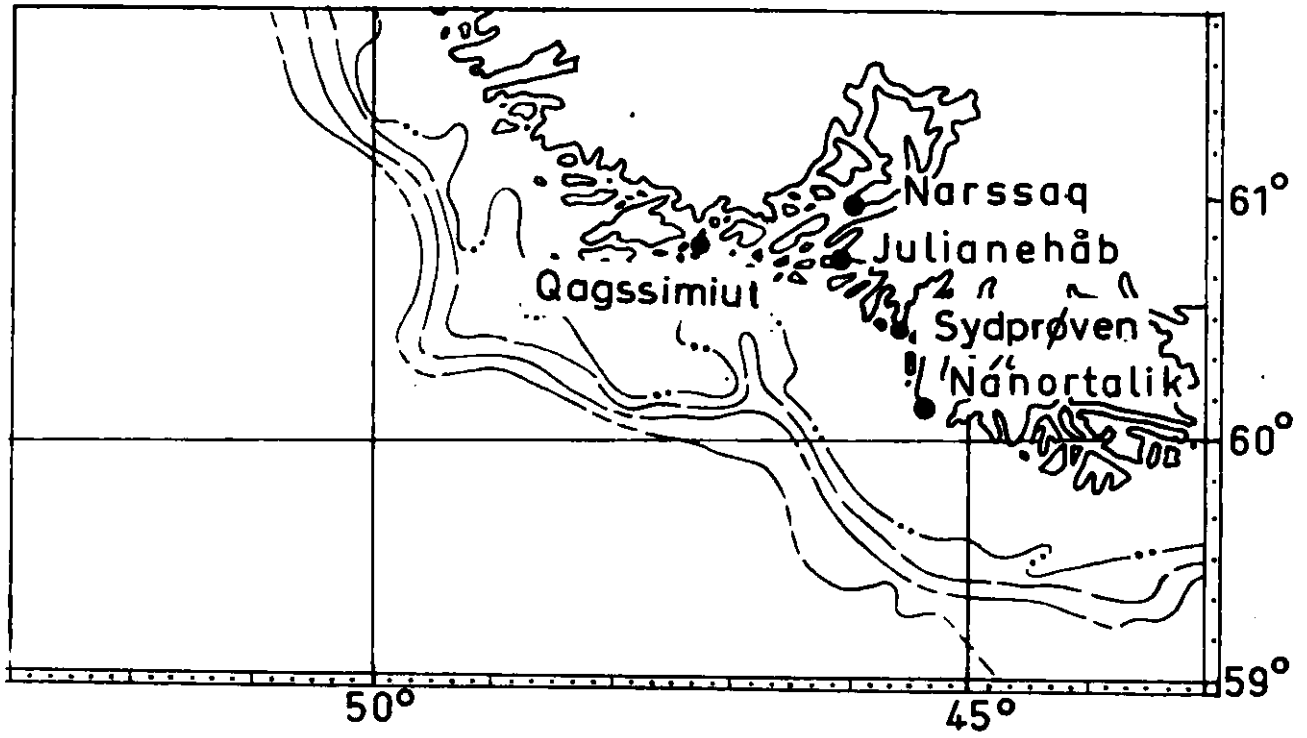


Fig. 1. Catch and samples of hooded seals per half month, South Greenland 1970 - 1973.

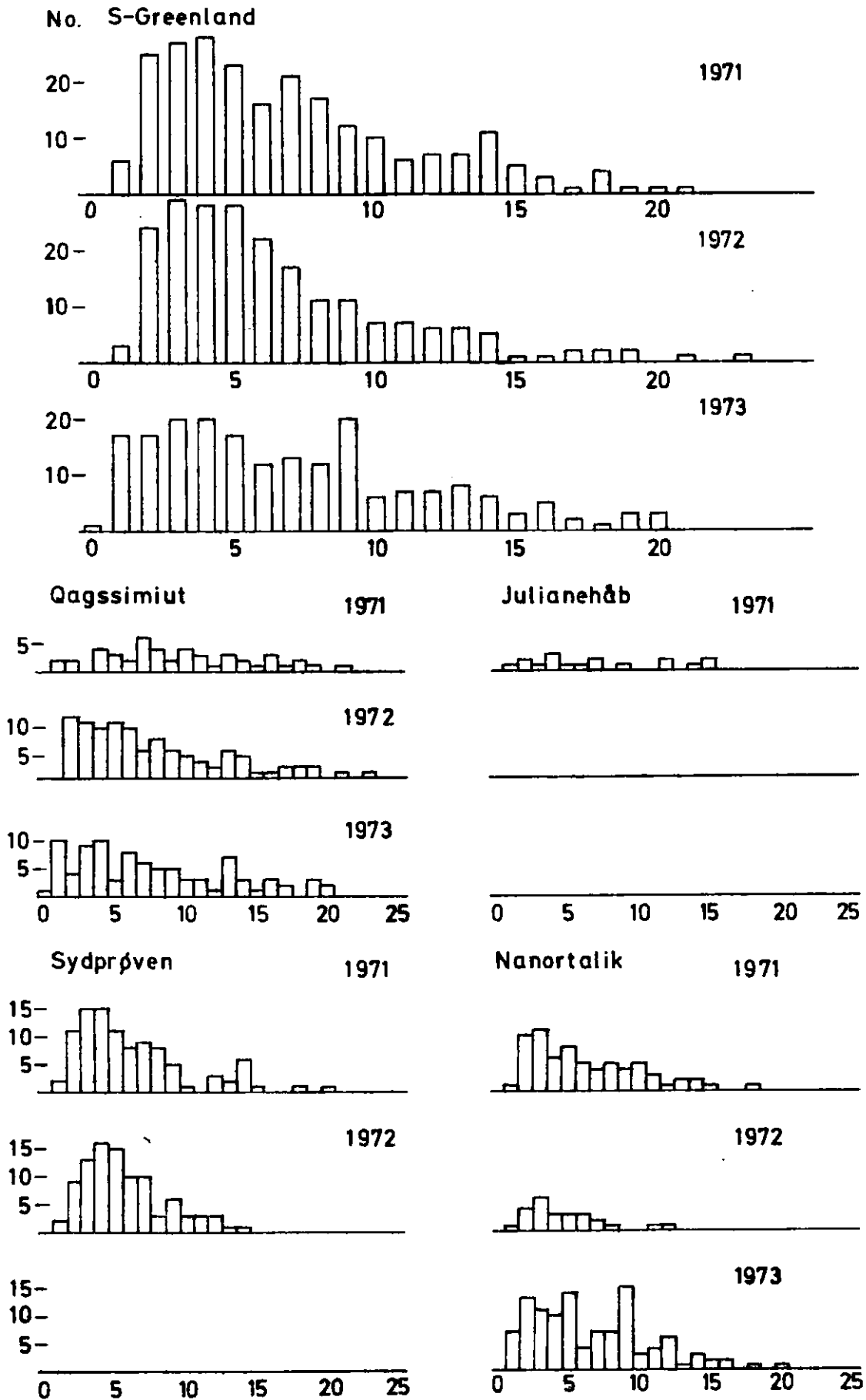


Fig. 2. Age composition of hooded seals caught in South Greenland, 1971-1973.