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Data on the Shrimp Fishery at East Greenland in 1983 compared  
to earlier years

by

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INTRODUCTION

In 1983 a total catch in Greenland waters in the Denmark Strait of only ab. 4,100 tons of shrimp was reported to the Greenland authorities, in spite of a regulation of the fishery with a total allowable catch of 5,725 tons.

Logbooks from only two Greenland trawlers fishing shrimp at East Greenland in March and April 1983 have been available to the Greenland Fisheries Investigations.

This paper updates the information reported by Carlsson in 1983 on reported catches and analysis of commercial fishery data.

REPORTED CATCHES IN 1982 AND 1983

Table 1 shows catches as reported to the Greenland authorities in 1982 and 1983 by month and country, and Table 2 the numbers of reporting vessels. The Figures for 1982 are updated compared to those given by Carlsson (1983). Only trawlers above 80 GRT are obliged to report, but it is assumed that smaller vessels do not participate in the East Greenland shrimp fishery.

The total number of vessels fishing at East Greenland in 1983 is similar to that of 1982, however a larger number of Greenland vessels moved to the area in spring 1983, due to the closure by ice of the main off-shore shrimp fishing grounds at West Greenland from February to May.

While the scientific advice given by NAFO for 1983 was an overall catch of shrimp in the Denmark Strait not exceeding 4,200 tons, the fishery on the western side of the midline between Iceland and Greenland was regulated by a TAC of 5,725 tons, of which however only about 4,100 tons have been fished according to the reporting.

Although ice conditions according to personal information from a Danish skipper did not hinder the access to the fishing grounds at East Greenland in 1982, the fishery was restricted to the period from February to June, while in 1983 fishing took place throughout the year except in February and December.

GEOGRAPHICAL DISTRIBUTION OF THE FISHERY

Logbooks from only two Greenland vessels fishing at East Greenland in 1983 have been available to the Greenland Fisheries Investigations, covering only the months of March and April (a total of 286 hauls). Figure 1 shows the total distribution of the hauls and Figure 2 the distribution of the total catches, with far the highest catch being obtained in statistical square unit JT112 at 65°40'N 30°25'W.

Due to the few data available, strong conclusions cannot be made on the distribution of the total fishery. The available information shows in general a similar distribution of hauls as in 1982 (Carlsson, 1983), however with a more concentrated fishery at 66° 45' N 30° 10' W, and a few hauls to the west of this position at 34° 45' W.

According to personal information from a Danish skipper the shrimp fishery in January 1983 was concentrated around 66° N to 66° 15' N at 30° W on concentrations of berried females, with smaller shrimps without roe being found to the south of this area.

In February ice hindered the access to the fishing grounds.

#### CATCH AND EFFORT

Number of hauls and mean catch rates in March and April 1983 based on the available logbook information are shown in Figure 3 in 7.5 x 15 minutes statistical units. There is a general decline in catch rates throughout the period.

Based on logbook data from 1980 to 1982 the main fishing ground off East Greenland is defined as the area from 65° 30' N to 67° 38' N and from 31° W to the midline between Greenland and Iceland waters (Carlsson, 1983). Tables 3 and 4 show the mean catch rates and corresponding number of hours trawled by month from 1980 to 1983 in a south to north 7.5 minute latitude grid in the main fishing area. The few data available for 1983 does not show any geographical shift in the fishery from March to April, but the decline in catch rates is evident.

The mean catch rates for the whole main fishing area based on the available logbook information are shown in Figure 4. Except for 1982 every year shows a steep decline in catch rates throughout the spring period of fishing, assumed to reflect that the early fishing is performed on concentrations of berried female shrimp later spreading out over the area. In 1982 the high spring catch rates were not obtained, although there were no indications of ice hindering the access to the fishing grounds where they are normally found. In 1983 peak catch rates were present, but not of the size found in 1980 and 1981, and the steep decline had shifted towards earlier months of the year, reflecting that either the main concentrations of berried females in this year as in 1982 show a different geographical distribution at that time of the year compared to 1980 and 1981, or the impact of the fishery on the shrimp stock (Carlsson, 1983).

#### BY-CATCHES AND DISCARD OF SHRIMP

The available logbook data includes only small amounts of by-catch, i.e. ab. 5 tons of redfish and mixed species compared to a total logbook catch of 245 tons of shrimp.

No information is available on the discard of shrimp in the fishery.

#### Biological Samples

A total of four shrimp samples from the commercial shrimp fishery at East Greenland in 1983 has been available to the Greenland Fisheries Investigations. The samples are from statistical square units FS-112 and FT-112 in the southernmost part of the main fishing area, collected by an observer on April 24 and 25. Figure 5 shows a combined mean length-frequency diagram after weighting each sample by mean catch of shrimp per hour and Fig. 6, the sexual components of the combined samples. Males were totally absent in the samples. Transitionals, all with head roe, made up 4.4% in number in the combined sample, showing one modal length group around 28 mm carapace length. Unberried females, which may not have spawned in the previous year or lost the eggs after spawning (there was no indications of egg hair), all showed development of new head roe. They made up 2.1% of the combined sample and there are indications of two modal length groups at 29 and 32 mm carapace length. Berried females made

up 93.4% of the combined sample and showed one modal length group around 29 mm carapace length, but other modal groups may be hidden. About 50% of the berried females showed early development of new head roe, but there will still be sufficient time before the spawning period for all to develop head roe.

#### CONCLUSIONS

Data from logbooks of only two trawlers, fishing only in March and April, show the same general distribution of the fishery in 1983 as in 1982, the fishery however being more concentrated in smaller areas. Peak catch rates were smaller and obtained in earlier months than in 1981 and 1982, with a steep decline from March to April. It is still an open question whether this reflects either differences in the distribution of concentrations of berried female shrimp from year to year or depletion of the shrimp stock due to the fishery - or both.

Biological samples from April showed total absence of males in the southernmost part of the main fishing area. About 2% of the female shrimp were unberried, but showed early development of new head roe.

#### REFERENCES

- Carlsson, D.M., 1983. Data on the shrimp fishery at East Greenland, 1980-82. NAFO SCR Doc., No. 83/I/9, Ser. No. N647.

Table 1. Catches of shrimp (tons) at East Greenland by month and nation as reported to Greenland authorities in 1982 (a) and 1983 (b).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
a. 1982													
Greenland	-	26	644	424	5	16	-	-	-	-	-	-	1115
Denmark	-	23	112	213	298	-	-	-	-	-	-	-	646
Faroe Islands	-	94	308	243	92	-	-	-	-	-	-	-	737
Norway	-	59	258	773	715	-	-	-	-	-	-	-	1805
France	-	-	-	92	267	55	-	-	-	-	-	-	414
Total	-	202	1322	1745	1377	71	-	-	-	-	-	-	4717
b. 1983													
Greenland	156	-	905	303	94	9	-	-	-	-	-	-	1467
Denmark	-	-	38	166	-	-	-	-	-	-	-	-	204
Faroe Islands	-	-	185	122	63	73	-	-	-	-	-	-	443
Norway	-	-	50	329	309	426	22	197	105	157	132	-	1727
France	-	-	-	79	121	73	-	-	-	-	-	-	273
Total	156	-	1178	999	587	581	22	197	105	157	132	-	4114

Table 2. No. of vessels in the shrimp fishery at East Greenland by month and nation as reported to Greenland authorities in 1982 (a) and 1983 (b).

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
a. 1982													
Greenland	-	1	6	6	-	1	-	-	-	-	-	-	9
Denmark	-	1	3	3	3	-	-	-	-	-	-	-	3
Faroe Islands	-	7	10	10	5	-	-	-	-	-	-	-	11
Norway	-	3	7	16	14	-	-	-	-	-	-	-	17
France	-	-	-	1	2	2	-	-	-	-	-	-	2
Total	-	12	26	36	24	3	-	-	-	-	-	-	42
b. 1983													
Greenland	1	-	7	11	2	1	-	-	-	-	-	-	13
Denmark	-	-	1	2	-	-	-	-	-	-	-	-	2
Faroe Islands	-	-	5	5	3	2	-	-	-	-	-	-	9
Norway	-	-	1	14	14	11	3	6	3	4	3	-	15
France	-	-	-	2	2	2	-	-	-	-	-	-	2
Total	1	-	14	34	21	16	3	6	3	4	3	-	41

Table 3. Mean catch of shrimp (kg/hour) per month in the main fishing area at East Greenland in a south to north grid (7.5 minute latitude scale) based on logbooks of 8 trawlers in 1980, 5 trawlers in 1981 and 1982 and 2 trawlers in 1983.

[illegible]

Table 4. No. of hours trawled per month in a north to south grid in the main fishing area at East Greenland based on logbook information (see Table 3).

[illegible]

Table 5. No. of hours trawled per month and year from April 1980 to April 1983 in the main fishing area at East Greenland as reported in logbooks of 8 trawlers in 1980, 5 trawlers in 1981 and 1982, and 2 trawlers in 1983.

[illegible]

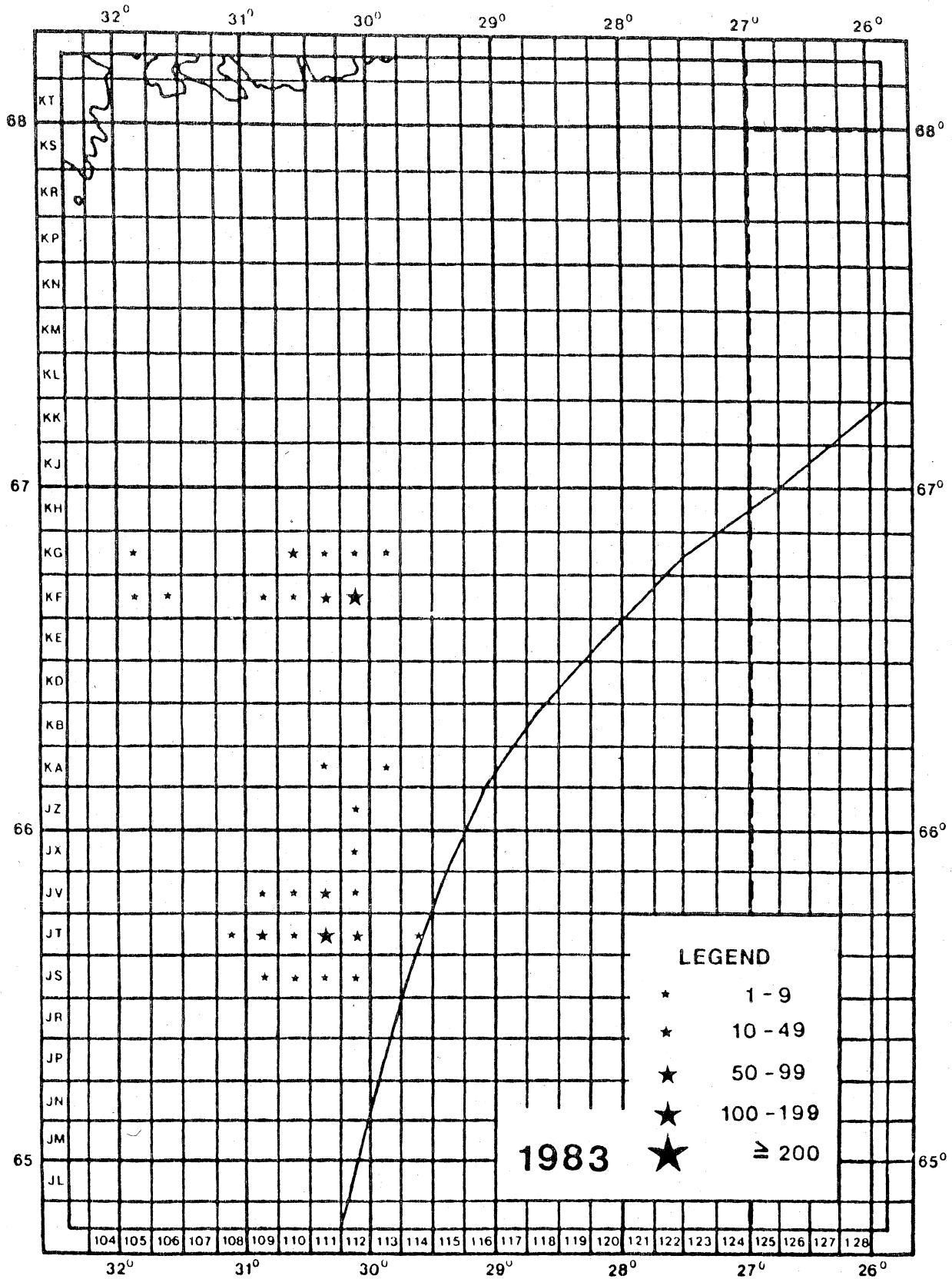


Figure 1. Distribution of hauls of 2 trawlers in the shrimp fishery at East Greenland in March and April 1983, based on logbook information.

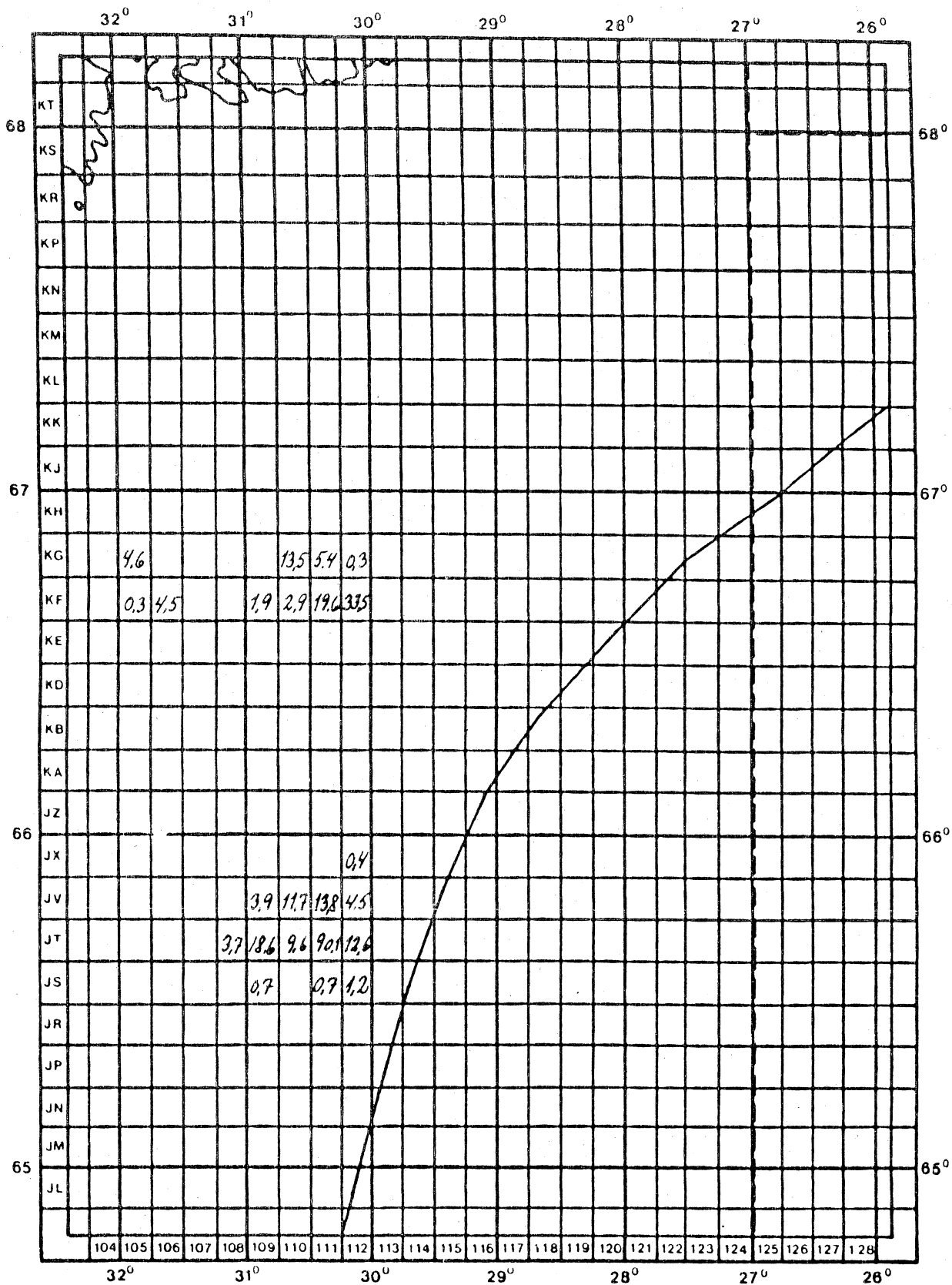


Figure 2. Distribution of total catches of shrimp (tons) by 2 trawlers fishing at East Greenland in 1983, based on logbook information.

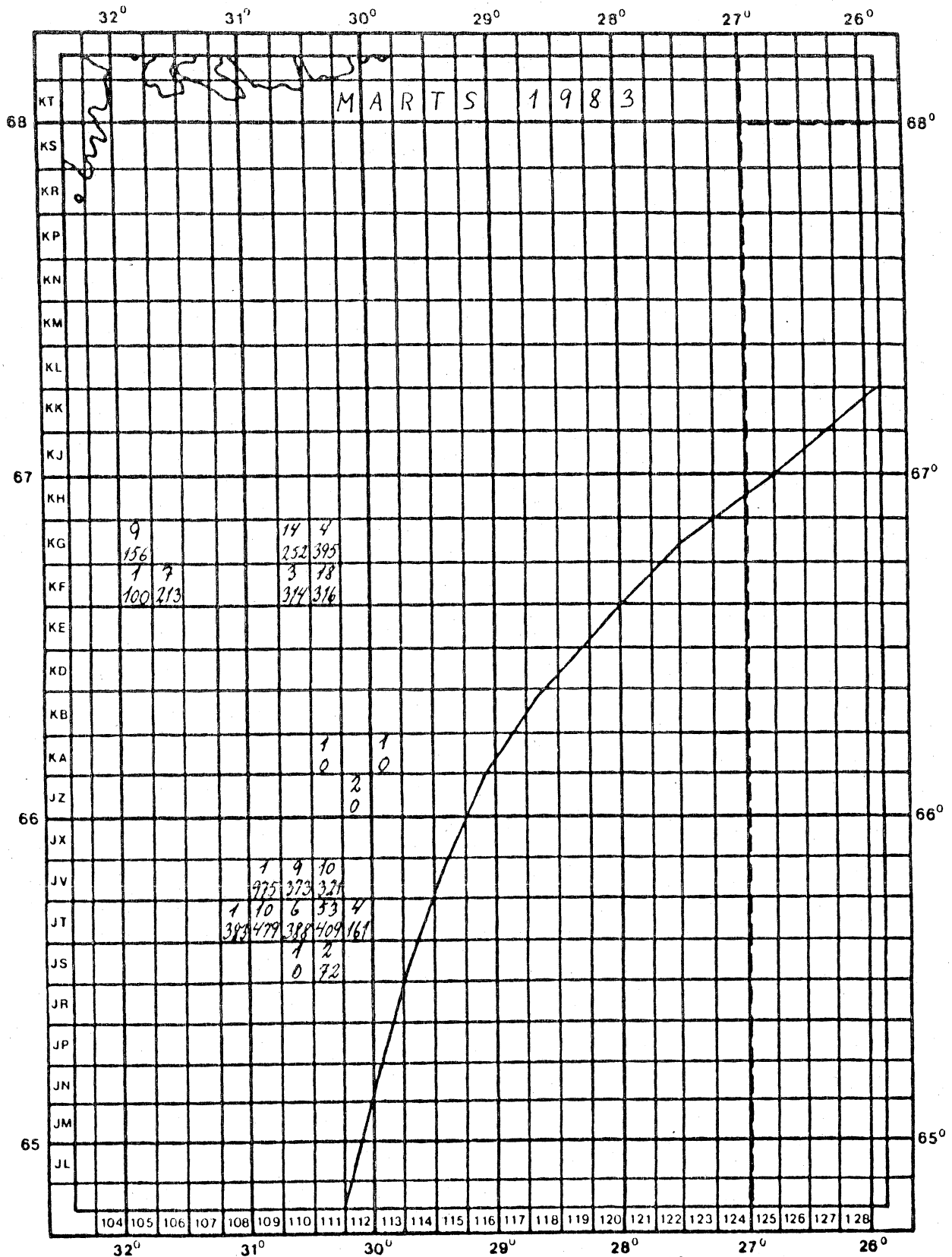


Figure 3a. Distribution of effort and mean catch of shrimp per hour in March 1983 based on logbook information from 2 trawlers. Upper figure in each statistical is no. of hauls, lower figure the mean catch rate (kg/hour).

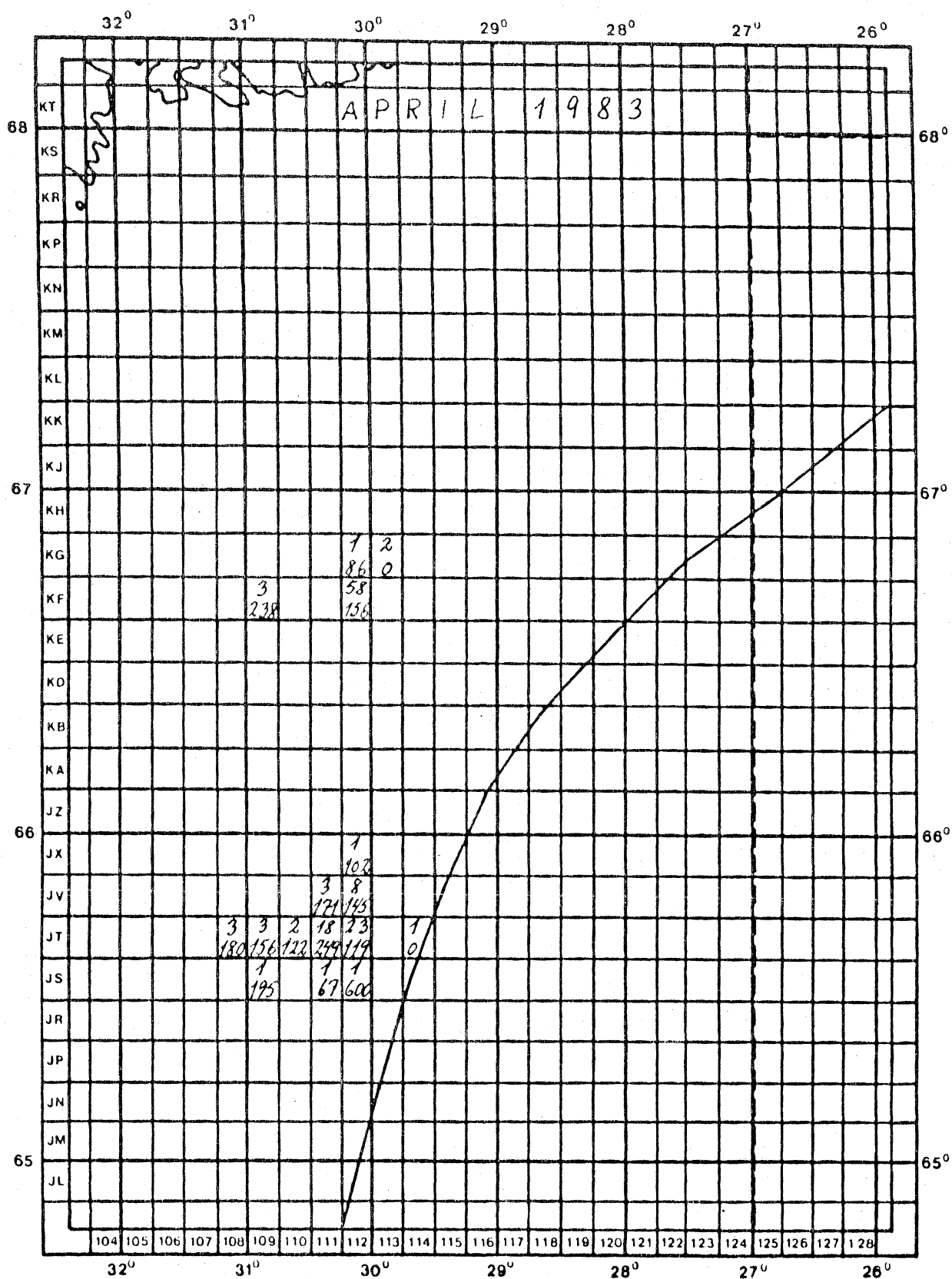


Figure 3b. Distribution of effort and mean catch per hour of shrimp in April 1983 based on logbook information from 2 trawlers. Upper figure in each statistical is no. of hauls, lower figure the mean catch rate (kg/hour).

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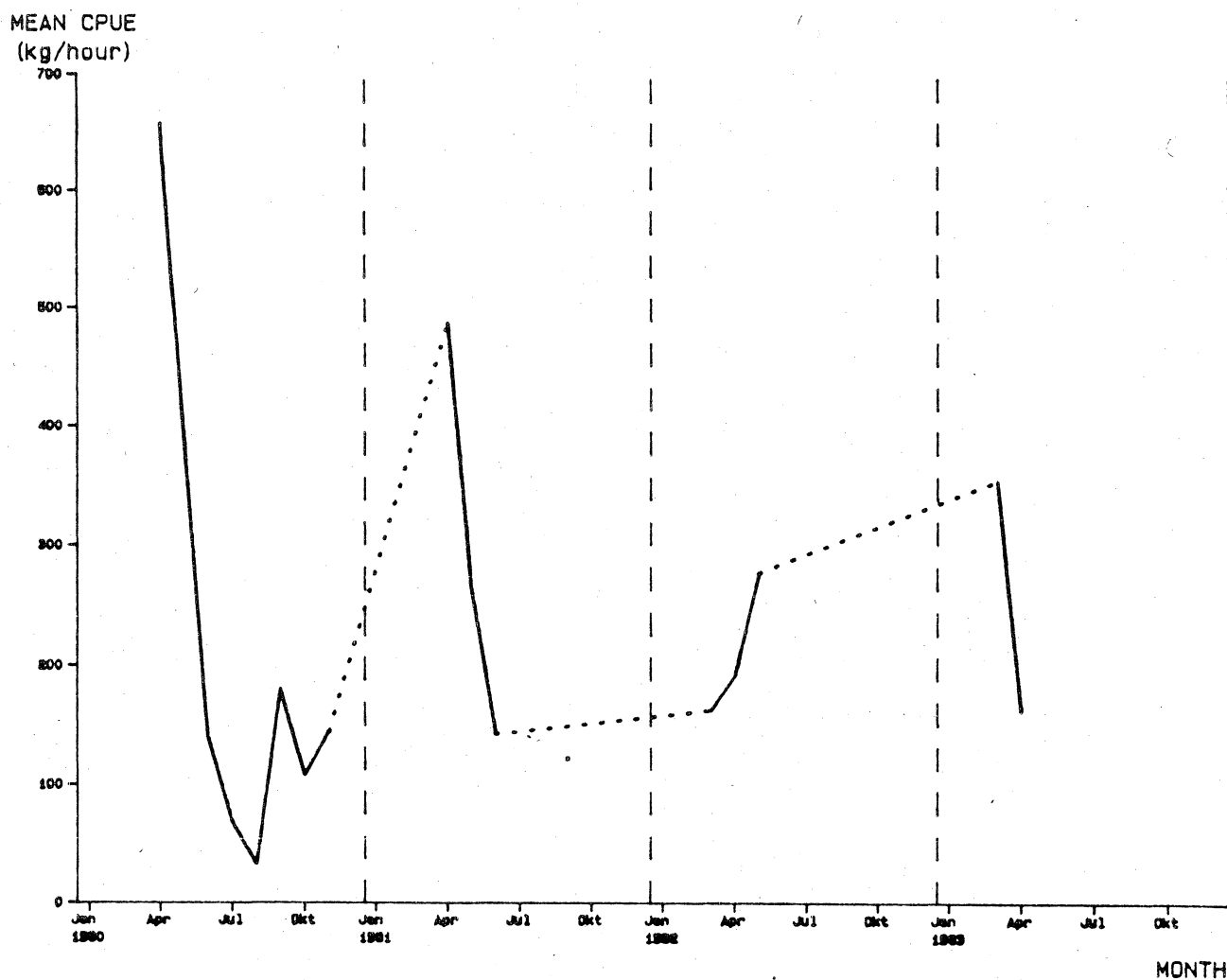


Fig. 4. Monthly mean catch rate of shrimp (kg/hour) in the main fishing area at East Greenland from April 1980 to April 1983 based on logbook information from 8 trawlers in 1980, 5 trawlers in 1981 and 1982, and 2 trawlers in 1983 (Table 5 shows the corresponding no. of hours trawled).

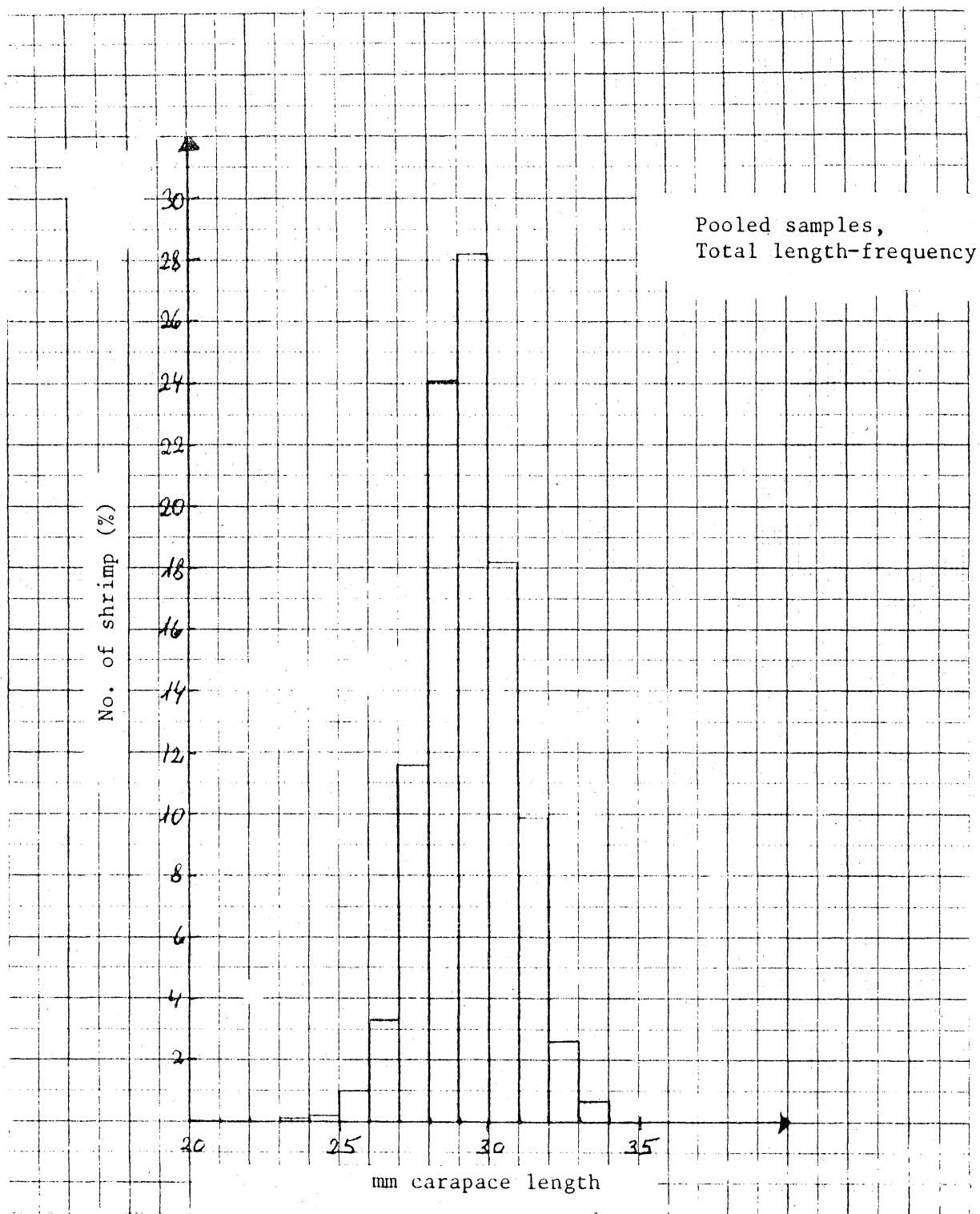


Fig. 5. Length-frequency of commercial shrimp catches in late April 1983, based on four shrimp samples from statistical square units FS-112 and FT-112, pooled after weighting by mean shrimp catch per hour.

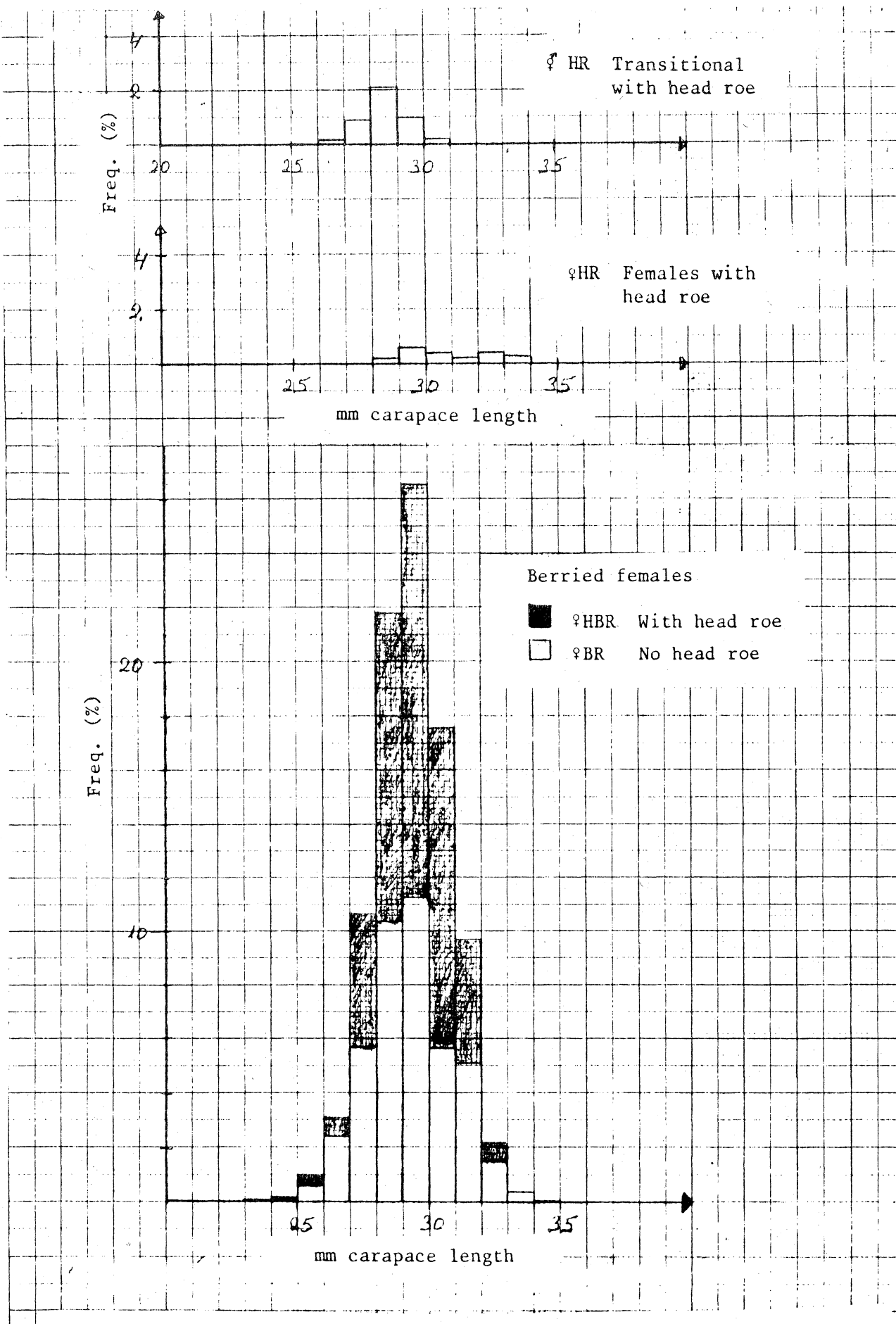


Fig. 6. Sexual components of combined sample shown in Fig. 5.