

Northwest Atlantic



Fisheries Organization

Serial No. N2466

NAFO SCR Doc. 94/86

SCIENTIFIC COUNCIL MEETING - SEPTEMBER 1994

The Greenland Fishery for Northern Shrimp (*Pandalus borealis*)  
on Flemish Cap, 1993 and 1994

by

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**Introduction**

Based on weekly reporting to Greenland authorities by all Greenland vessels the total catch at Flemish Cap (NAFO Div. 3M) in 1993 amounts to 3.773 tons. The total catch in 1994 until September 5th amounts to 2.202 tons. 12 vessels participated the fishery in 1993 and nine vessels in 1994. Only one Greenland vessel remained on the fishing ground in September 1994.

Logbook data provided information on fleet performance to the Greenland Fisheries Research Institute. In 1993 logbook data covers 9.966 hours of trawling and a total catch of 3.769 tons. In 1994 data covers 6.450 hours and a catch of 1.768 tons - about 80 % of the total reported catch in 1994.

This paper updates information on the geographical distribution and catch rates in the Div. 3M shrimp fishery. Also, results from analysis of samples from the commercial shrimp fishery are presented.

**Materials and Methods**

Based on the compulsory weekly reporting to Greenland authorities total catches and numbers of vessels in the shrimp fishery in NAFO Div. 3M were compiled by week from late May 1993 until September 1994.

Logbook data was analyzed to show the yearly and monthly distribution of catches, fishing effort and mean catch-rates.

Shrimp samples from the commercial fishery in 1994 were available from Div. 3M in June. Samples were sorted by sexual characteristics. Shrimp were measured to nearest .1 mm carapace length and pooled in .5 mm length groups by month to show overall size distribution of commercial catches.

## Results and Discussion

### Reported Catches 1993 - September 1994

Table 1 shows catches by week and the numbers of reporting vessels in Division 3M in 1993 as reported to Greenland authorities. The total shrimp catch was 3.778 tons. 12 vessels has participated. Table 3 shows the same information for April through September in 1994. The shrimp catch amounts to 2.202 tons, taken by nine trawlers.

Reported catches in January through August declined from about 3.600 tons in 1993 to about 2.200 tons in 1994.

### Catch and Effort

The catch reported in vessel logs was divided by corresponding effort, providing an unstandardized catch rate. Catch (tons), CPUE (kg/hr) and effort(hours trawled) by week are given in Table 2 and 4, for 1993 and 1994 respectively. Table 5 and 6 show the same data, compiled by month in 1993 and 1994.

Data from 1994 are incomplete, and it is therefore difficult to compare this year with 1993. However, a decrease in effort and catch is evident. In both 1993 and 1994 the CPUE's declined steadily from late May to July (Fig.5). The unstandardized catch rate never reach the same level in 1994 as in 1993.

### Geographical Distribution of the Fishery

Figures 2 and 4 show the geographical distribution of the fishery and total catches (tons) as recorded in logbook data for 1993 and 1994 respectively. The fishery concentrated between 46°30'N and 48°30'N. Highest catches were taken at the northernmost and western grounds. Figure 3a-3f show the monthly distribution of catch-rate (kg/h) and effort from May through October 1993, and Figure 5a-5d the same data on the monthly distribution from April to July 1994.

The 1994 reported activity and catch was more concentrated in the southwestern area compared to the more widespread fishery in 1993. In both years, effort was concentrated near the 400 m contour.

### Biological Samples

Samples were taken from the commercial fishery in Div. 3M from 13th to 17th of June in 1994 in the southwestern area of the bank - around 47°00'N and 46°00'W. The samples were sorted by sexual characteristics. Fig. 1 shows the length frequency diagram for the samples, and Table 7 gives the numbers of shrimp by length group in the samples.

Biological samples are dominated by a female group at 27.5 mm CL. Two male groups at 21 mm and 24.5 CL are present.

### Shrimp Discard and By-catches

By-catch information and shrimp discard were compiled from logbooks in 1993 and 1994 (Table 8). Redfish was the most dominant species in the by-catch. However, reported levels on by-catches and discards should be taken with caution.

Reported(93)	31.05	07.06	14.06	21.06	28.06	05.07	12.07	20.07	26.07	02.08	09.08	16.08	23.08	30.08	04.09	13.09	20.09	27.1	03.10	all
Shrimp catches(t)	16	384	547	488	446	517	399	319	183	102	50	52	54	36	43	84	14	23	21	3778
No. of vessels	2	6	10	9	11	11	11	8	6	3	1	2	1	1	2	2	1	1	1	12

Table 1. Shrimp catches (tons) and no. of vessels by week in 1993 in NAFO Div.3M as reported to Greenland authorities.

Available logbook data	1993																			all		
Shrimp catch(t)	31.05	07.06	14.06	21.06	28.06	05.07	12.07	20.07	26.07	02.08	09.08	16.08	23.08	30.08	04.09	13.09	20.09	27.1	03.10	20	3769	
CPUE kg/hour	304	565	453	427	361	365	377	343	338	280	382	249	420	243	205	350	261	190	193	379		
Effort in hour	52	680	1211	1142	1225	1440	1051	1038	399	368	132	199	129	172	188	180	135	121	104	9966		

Table 2. Catch(t), CPUE(kg/hour) and effort(h) from logbookdata by week in 1993 in NAFO Div.3M.

Reported(94)	11.04	18.04	25.04	02.05	09.05	16.05	24.05	30.05	06.06	13.06	20.06	27.06	04.07	11.07	18.07	25.07	01.08	08.08	15.08	22.08	30.08	05.09	12.09	all	
Shrimp catches(t)	3	19	24	25	59	78	74	109	150	209	197	214	227	245	260	70	62	50	47	27	25	28	0	2202	
No. of vessels	1	1	1	1	2	2	2	3	5	6	6	6	8	8	6	2	2	2	2	2	1	1	1	0	9

Table 3. Shrimp catches (tons) and no. of vessels by week in 1994 in NAFO Div.3M as reported to Greenland authorities.

Available logbook data	1994																							all	
Shrimp catch(t)	11.04	18.04	25.04	02.05	09.05	16.05	24.05	30.05	06.06	13.06	20.06	27.06	04.07	11.07	18.07	25.07	01.08	08.08	15.08	22.08	30.08	05.09	12.09	1768	
CPUE kg/hour	47	138	181	182	232	310	399	349	269	311	252	264	213	314	421	189									274
Effort in hour	58	134	133	138	260	252	219	332	557	660	805	815	992	710	326	59									6450

Table 4. Catch(t), CPUE(kg/hour) and effort(h) from logbookdata by week in 1994 in NAFO Div.3M.

1993	CPUE Kg/h	Catch Tons	Effort Hours
May	470	53	113
June	428	2058	4811
July	348	1274	3658
August	308	222	721
Septembe	249	154	618
October	275	9	34
Mean/Total	379	3770	9955

Table 5.  
CPUE (kg / hour) ,  
catch ( t ) and  
effort (hrs) by month -  
NAFO Div.3M, 1993.

1994	CPUE Kg/h	Catch Tons	Effort Hours
April	150	67	445
May	311	384	1235
June	267	870	3261
July	297	447	1509
Mean/Tot	274	1768	6450

Table 6.  
CPUE (kg / hour) ,  
catch ( t ) and  
effort (hrs) by month -  
NAFO Div.3M, 1994.

FLEMISH CAP-1994	month			
	6			
	area			
	3M			
	sample w			
	84.52			
	catch			
	16234			
	No. of samples			
	19			
	MALE	PRIMI	FEMALE	NUMBERS
	MM			
	5	0	0	0
5.5	0	0	0	
6	0	0	0	
6.5	0	0	0	
7	0	0	0	
7.5	0	0	0	
8	0	0	0	
8.5	0	0	0	
9	0	0	0	
9.5	0	0	0	
10	0	0	0	
10.5	0	0	0	
11	0	0	0	
11.5	0	0	0	
12	0	0	0	
12.5	0	0	0	
13	1	0	1	
13.5	0	0	0	
14	1	0	1	
14.5	0	0	0	
15	1	0	1	
15.5	6	0	6	
16	16	0	16	
16.5	20	0	20	
17	23	0	23	
17.5	28	0	28	
18	27	0	27	
18.5	15	0	15	
19	26	0	26	
19.5	34	1	35	
20	76	1	77	
20.5	131	2	133	
21	119	3	122	
21.5	133	6	139	
22	91	9	104	
22.5	69	9	81	
23	101	20	125	
23.5	125	31	162	
24	109	34	164	
24.5	111	61	209	
25	40	92	184	
25.5	34	92	207	
26	29	88	243	
26.5	17	110	351	
27	6	143	561	
27.5	3	131	682	
28	6	102	728	
28.5	1	83	672	
29	1	66	498	
29.5	0	25	264	
30	0	13	111	
30.5	0	3	62	
31	0	4	29	
31.5	0	0	9	
32	0	0	1	
32.5	0	0	0	
33	0	0	0	
33.5	0	0	0	
34	0	0	0	
34.5	0	0	0	
35	0	0	0	
35.5	0	0	0	
36	0	0	0	
36.5	0	0	0	
37	0	0	0	
<b>TOTAL</b>	<b>1400</b>	<b>1129</b>	<b>3584</b>	

Table 7.

No. of shrimp per length group in commercial samples fra NAFO Div.3M.

SPECIES(KG)	1993	May	June	July	August	September	October
Redfish		215	27211	20413	1175	6320	1400
Mixed		395	12269	8252	530	1705	145
Cod		-	-	400	-	-	-
Halibut		-	-	270	-	-	-
Grl. halibut		-	-	335	-	-	-
Catfish		-	-	375	-	-	-
Total by-catch(kg)		610	39480	30045	1705	8025	1545
Corresponding shrimp catch(kg)		52996	2053478	1269651	222330	153732	9456
By-catches in % of shrimp catch		1.2%	1.9%	2.4%	0.8%	5.2%	16.3%
Reported discard(kg)		15	4396	3785	0	0	0

SPECIES(KG)	1994	April	May	June	July
Redfish		1155	3419	12905	7269
Mixed		1145	3017	3581	2009
Halibut		-	-	100	-
Total by-catch(kg)		2300	6436	16586	9278
Corresponding shrimp catch(kg)		66852	383844	869464	445710
By-catches in % of shrimp catch		3.4%	1.7%	1.9%	2.1%
Reported discard(kg)		0	619	988	1202

Table 8. By-catch(kg), shrimp discard(kg) and % of total shrimp catch as reported in logbook in 1993 and 1994.



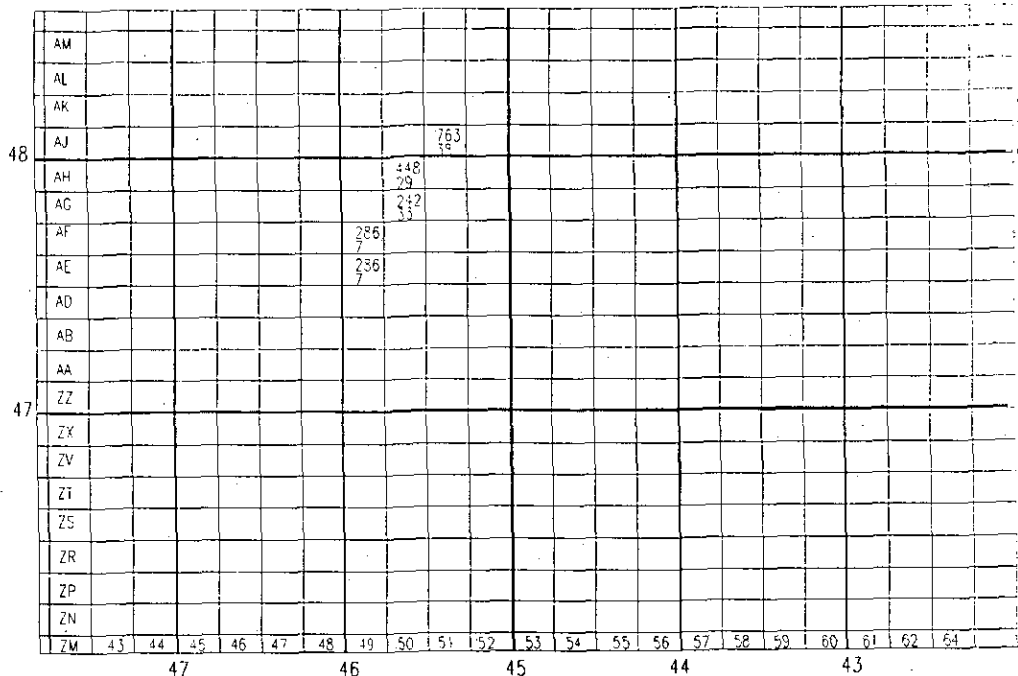


Figure 3a.  
Distribution of catch-rate (kg/hour) and effort (hours) in each statistical unit between 46°30N and 48°30N, NAFO Div. 3M in May 1993.

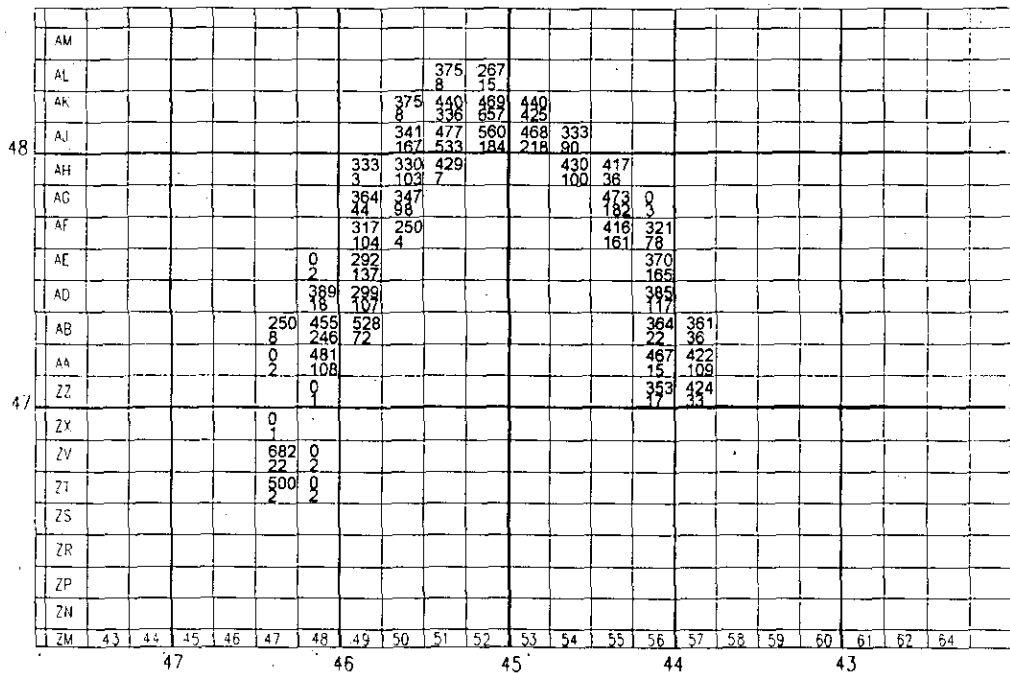


Figure 3b.  
Data from June 1993.







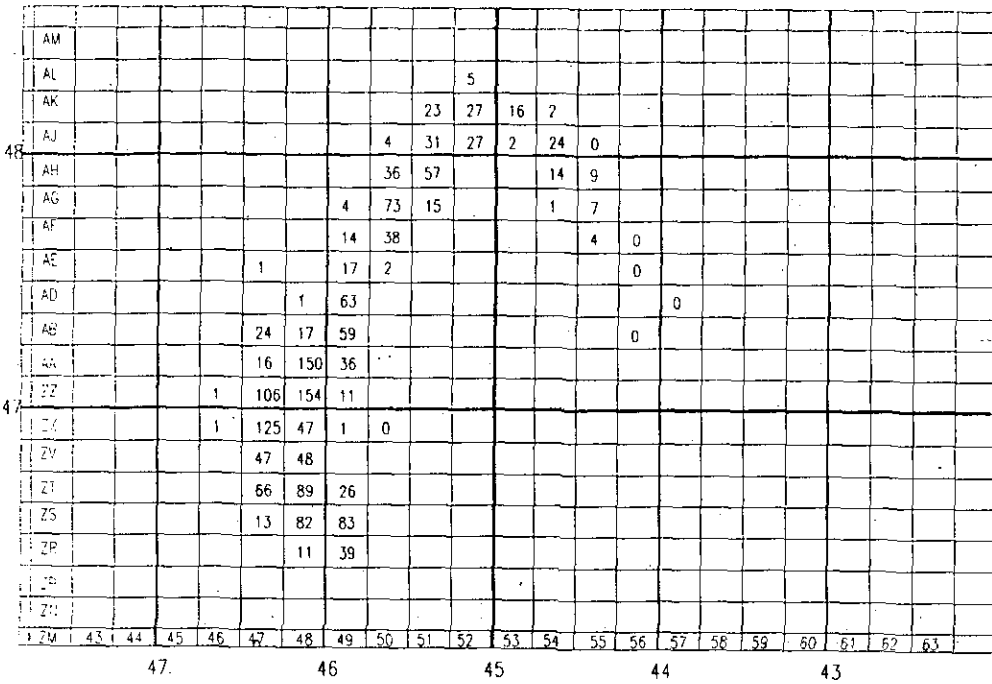


Figure 4. Distribution of total catches of shrimp (tons per statistical unit) in 1994 in NAFO Div. 3M between 46°30N and 48°30N, based on logbooks from Greenland trawlers.

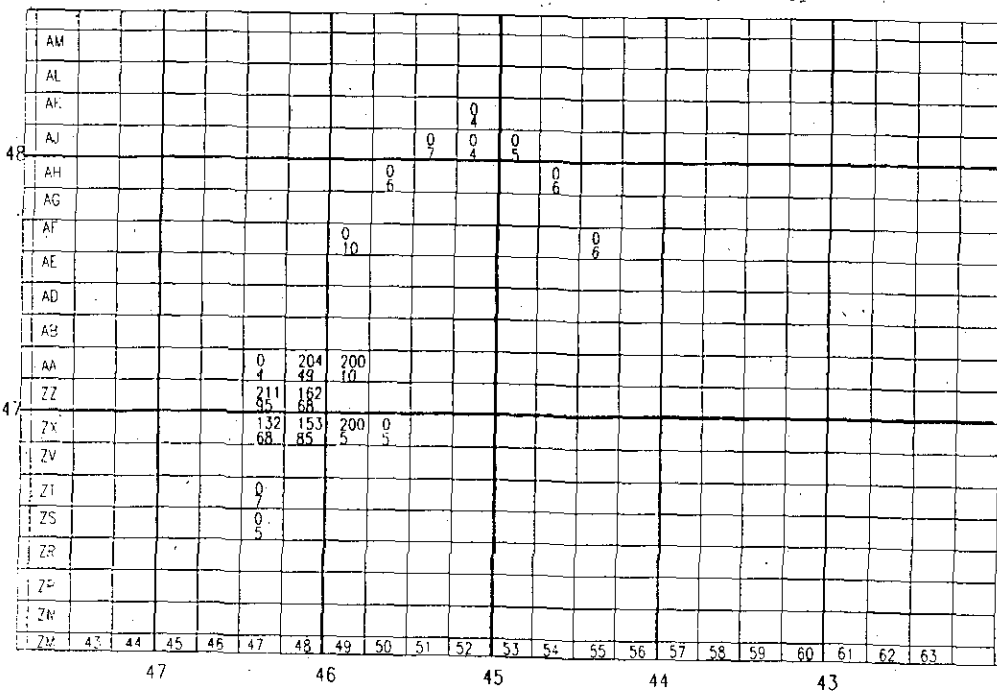


Figure 5a. Distribution of catch-rate (kg/hour) and effort (hours) in each statistical unit between 46°30N and 48°30N, NAFO Div. 3M in April 1994.



