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The Greenland Fishery for Northern Shrimp (*Pandalus borealis*)  
on Flemish Cap, NAFO Division 3M, in 1997 and 1998

by

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*Introduction*

In 1997 and 1998 (by September 1.) only two Greenland trawlers participated in the Flemish Cap fishery from May to August. Based on weekly reporting to Greenland authorities by Greenland vessels the total catch at Flemish Cap in 1997 amounted to 105 tons. The total catch in 1998 until September 1.th amounts to 853 tons.

Logbook records provided information on fleet performance to the Greenland Institute of Natural Resources. Logbook data covered 603 hours of trawling and a total catch of 105 tons in 1997. In 1998 received logbooks until September 1.th covers 2.576 trawling hours and 625 tons of catch - about 80% of the total reported catch in 1998.

This paper updates information on the geographical distribution and catches rates in Div. 3M for 1997 and 1998 and presents results from biological samples from the commercial shrimp fishery.

*Materials and methods*

Based on compulsory weekly reporting to Greenland authorities total catches and numbers of vessels in the shrimp fishery i NAFO Div. 3M was compiled by month from May 1997 until e late August 1998.

Catch and effort data from individual fishing vessels as reported in vessels logs were analysed to show the monthly distribution of catches, fishing effort and mean unstandardized catch rates.

Size composition of shrimp catches were generated from samples from the commercial fishery in May and June 1998. Samples taken by observers before processing were sorted by sexual characteristics and measured to the nearest 0.1mm carapace length. The data were then pooled in 0.5mm length groups by month.

*Results*

Reported catches in 1997 - September 1998

Nominal catches off shrimp and numbers of Greenland vessels participating in the Flemish Cap fishery from 1993 to 1998 (up to September 1.th) are

Year	1993	1994	1995	1996	1997	1998
Catch (tons)	3778	2275	2400	1107	105	853
No. of vessel	12	9	6	6	2	2

### Catch, effort and CPUE

In 1997 and 1998 the fishery commenced from May to August. The catch rates for single and twin trawl in 1997 and 1998 were less than 180 kg/hours and 280 kg/hr respectively. The catch rate showed no trend during seasons or between single and twin trawl.

Catch (tons), effort (hours) and catch rates divided in single trawl fishery (1) and twin trawl fishery (2), as reported in vessel logs in 1997 and 1998 are

Year	Month Trawl	May		June		July		August		Total 1+2
		1	2	1	2	1	2	1	2	
1997	Tons	45	-	14	-	-	46	-	-	105
	Hours	262	-	82	-	-	259	-	-	603
	kg/hr	171	-	171	-	-	178	-	-	174
1998	Tons	3	95	7	229	-	282	-	9	625
	Hours	12	470	30	836	-	1184	-	44	2576
	kg/hr	234	202	228	274	-	238	-	208	243

### Shrimp Discard and By-catches

Total shrimp discard is reported in logbooks to 150 kilo and 2.946 kilo in 1997 and 1998 respectively, or less than 1% of the total shrimp catch.

Redfish reported as by-catch in logbook data from 1997 amounted a total of 400 kilo (less than 1% of total shrimp catches) and other fin-fish reported as by-catch amounted 220 kilo. The information on by-catches from 1998 is recorded as fin-fish only and amounted 6.436 kilo or less than 1% of total shrimp catches.

### Geographical Distribution of the Fishery

Figure 1 and 2 shows the geographical distribution of total catches in 1997 and 1998 respectively as recorded in vessel logs. Figure 3 and 4 shows the distribution by month and catch rates. In 1997 the fishery was concentrated at the north-western part of the Flemish Cap, whereas in 1998 the fishery took place at the northern and north-eastern part where also the highest catch rates were recorded.

### Length Distributions

The total length distribution (unweighted) by sex in Greenland catches at Flemish Cap are showed in figure 5 and for the month June and July in figure 6 and 7. The size compositions in 1998 showed that small males with a modal Cp. length of 19 mm dominated the catch in numbers. The female component consists of two groups: one with a modal Cp. length of 23,5 mm and one at 26,0 mm. A smaller male group was evident at 15 mm.

The length distribution in Greenland catches change from June to July towards smaller shrimp. The catch composition in June consists of more female and large male (males at 21,0 mm Cp. length) than in July.

### **Conclusions**

Greenland catches has been decreasing since the beginning of the fishery, from about 3.800 tons in 1993 to 105 tons in 1997. In 1998 the catches increased again to 853 tons to end of August. The decreasing interest in the shrimp fishery in the area may be explained by reduction in numbers of trawlers participating the fishery, distance to the fishing grounds and unprofitable catch rates.

The catch rates decreased from 274 kg/hour in June to 238 kg/hour in July and in the same time changed the size composition in the catch towards smaller males. This could explain the lower catches in August and why the two trawlers, that has participating the fishery in 1998, has left the area.

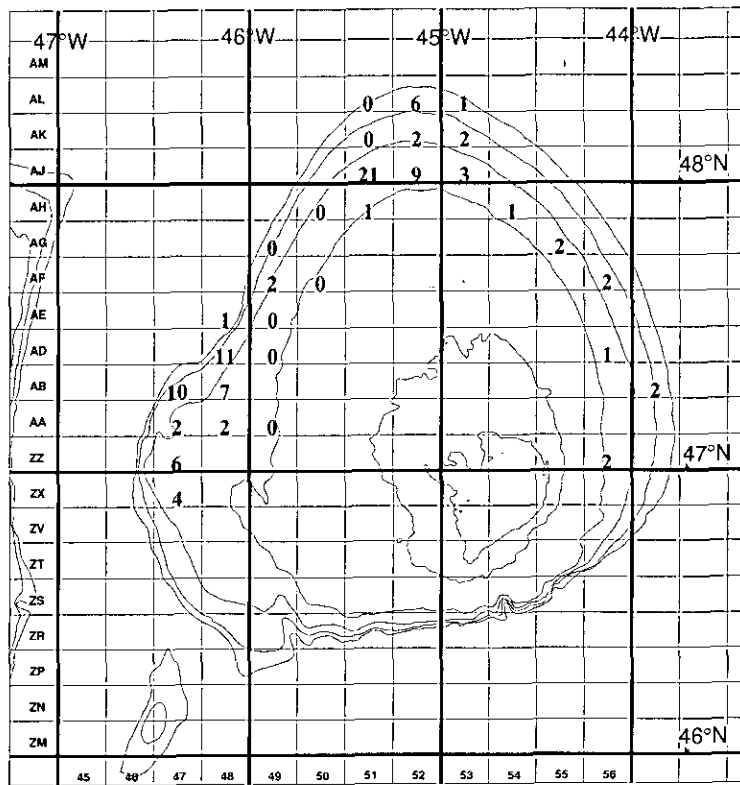


Fig. 1. Geographical distribution of shrimp catches in 1997 on Flemish Cap (tons by statistical unit).

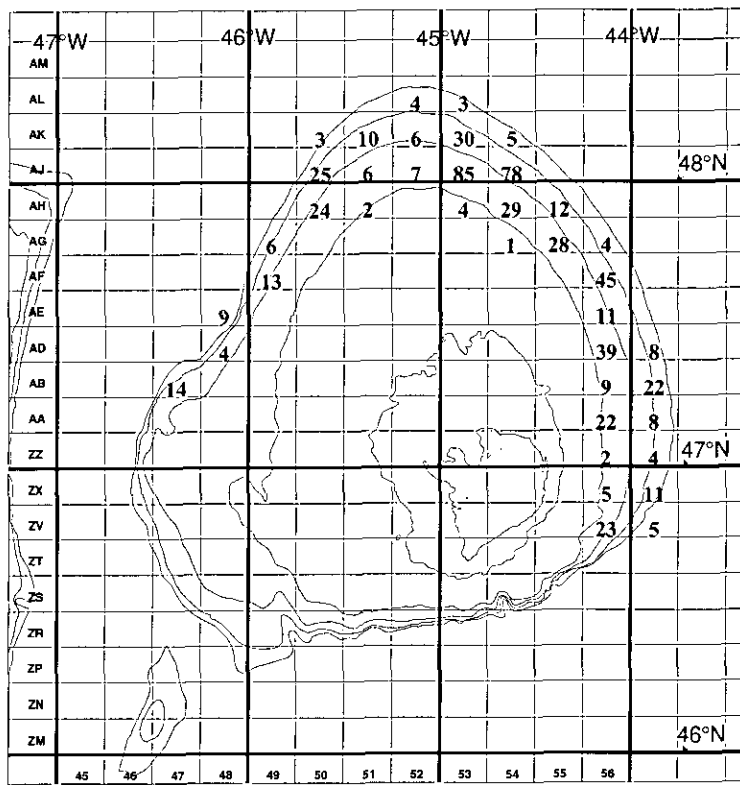


Fig. 2. Geographical distribution of shrimp catches in 1998 on Flemish Cap (tons by statistical unit).

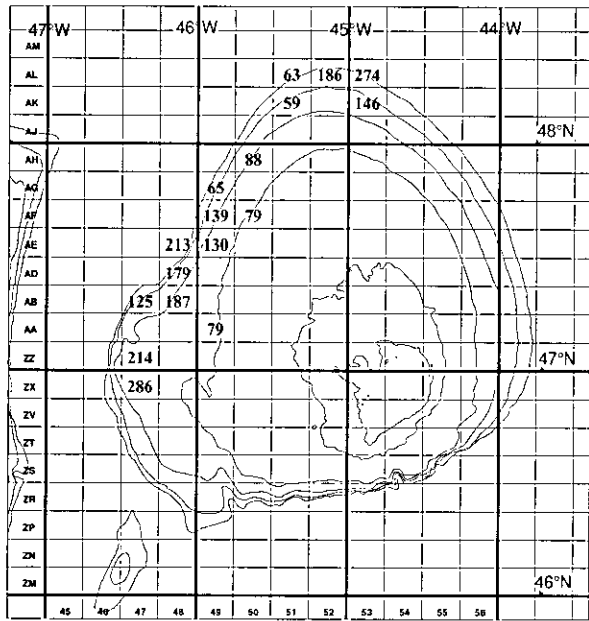


Fig. 3a. Geographical distribution of CPUE (kg/hours) in May 1997 on Flemish Cap.

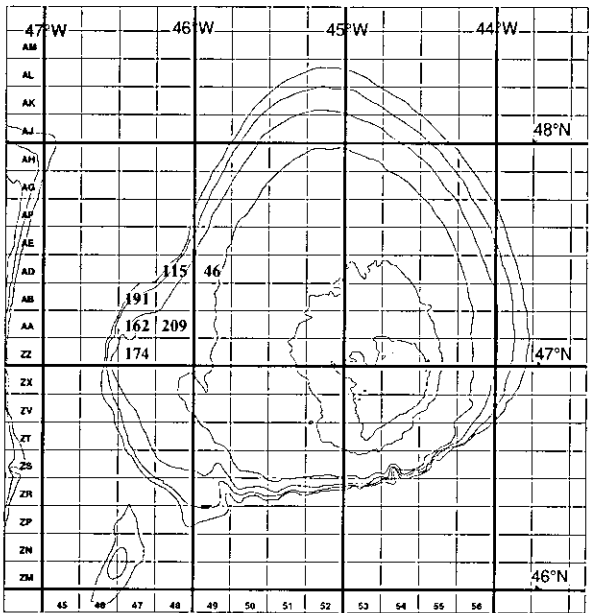


Fig. 3b. Geographical distribution of CPUE (kg/hours) in June 1997 on Flemish Cap.

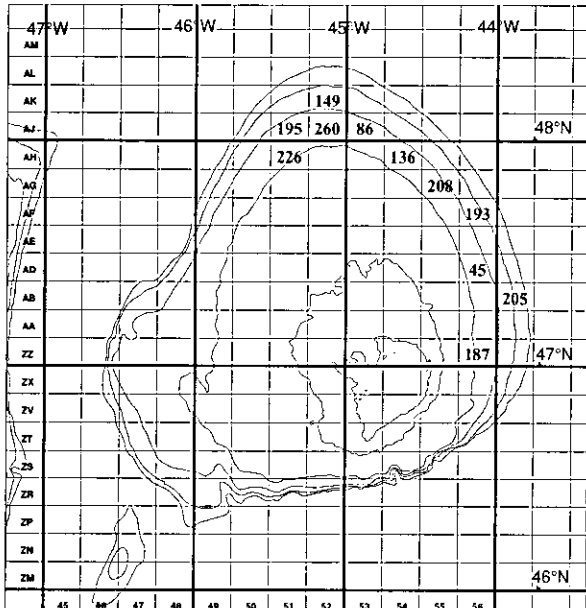


Figure 3c. Geographical distribution of CPUE (kg/hours) in July 1997 on Flemish Cap.

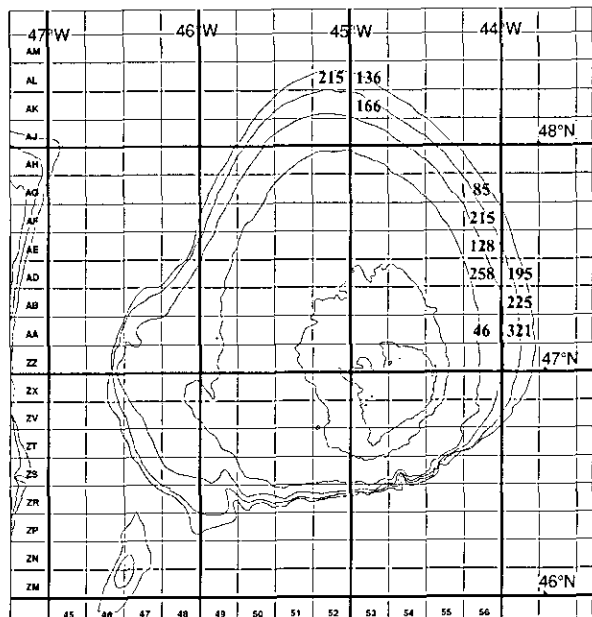


Fig. 4a. Geographical distribution of CPUE (kg/hours) in May 1998 on Flemish Cap.

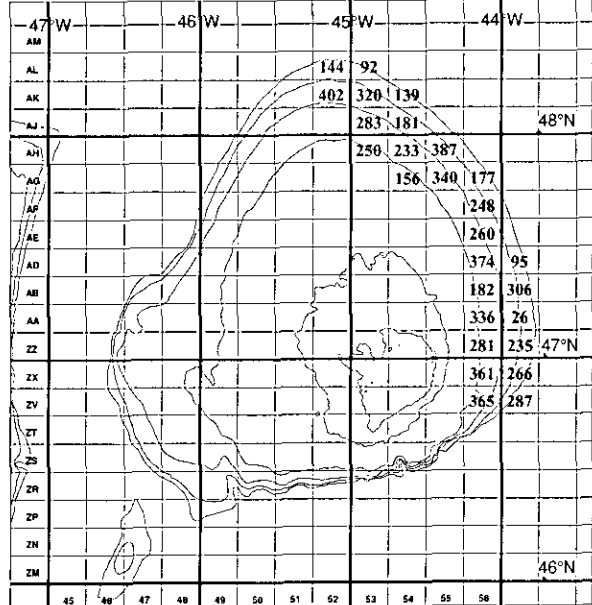


Fig. 4b. Geographical distribution of CPUE (kg/hours) in June 1998 on Flemish Cap.

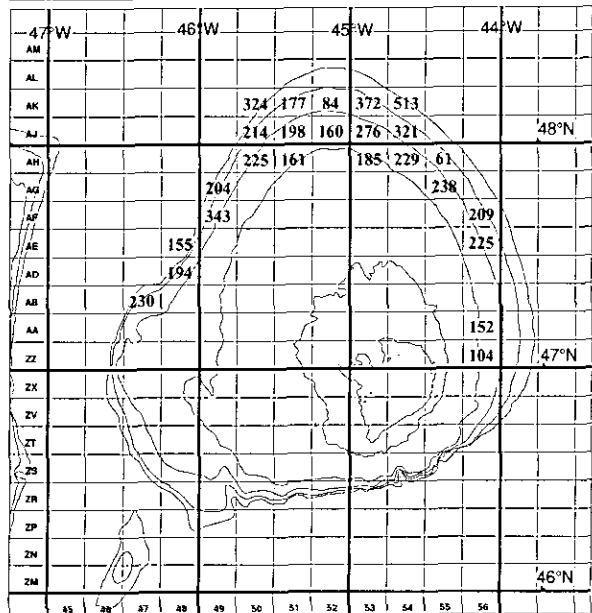


Fig. 4c. Geographical distribution of CPUE (kg/hours) in July 1998 on Flemish Cap.

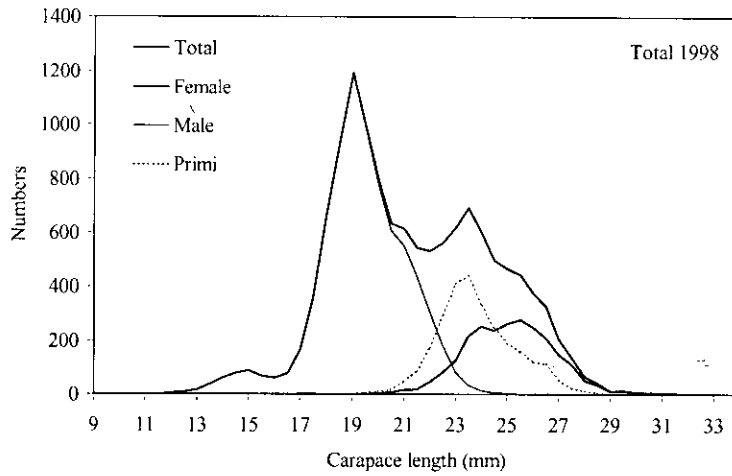


Fig. 5. Total unweighted commercial length distribution by sex in Greenland catches, NAFO Div. 3M, in 1998, based on 28 samples including 13,037 shrimps.

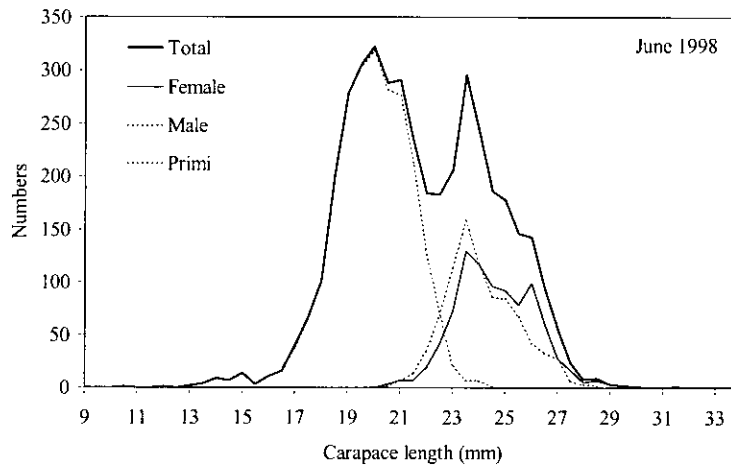


Fig. 6. Total unweighted commercial length distribution by sex in Greenland catches, NAFO Div. 3M, June 1998, based on 10 samples including 4,160 shrimps.

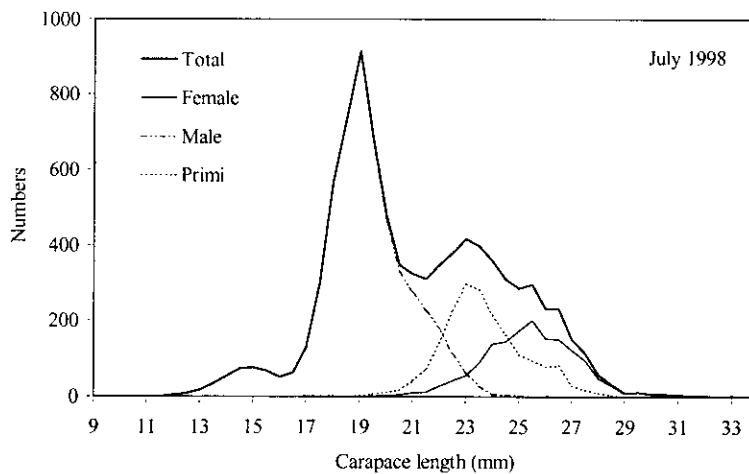


Fig. 7. Total unweighted commercial length distribution by sex in Greenland catches, NAFO Div. 3M, July 1998, based on 18 samples including 8,907 shrimps.

## Appendix 1 Shrimp samples from Flemish Cap in June and July 1998.

Year	1998					Year	1998					Total 1998					
Month	June					Month	July					Month	June+July				
Sample weight	27					Sample weight	54					Sample weight	81				
No of sample	10					No of sample	18					No of sample	28				
Corresponding lookbook	28650					Corresponding lookbook	46862					Corresponding lookbook	75512				
Length	Female	Male	Primi	nidentifi	Total	Length	Female	Male	Primi	nidentifi	Total	Length	Female	Male	Primi	nidentifi	Total
5.0	0	0	0	0	0	5.0	0	0	0	0	0	5.0	0	0	0	0	0
5.5	0	0	0	0	0	5.5	0	0	0	0	0	5.5	0	0	0	0	0
6.0	0	0	0	0	0	6.0	0	0	0	0	0	6.0	0	0	0	0	0
6.5	0	0	0	0	0	6.5	0	0	0	0	0	6.5	0	0	0	0	0
7.0	0	0	0	0	0	7.0	0	0	0	0	0	7.0	0	0	0	0	0
7.5	0	0	0	0	0	7.5	0	0	0	0	0	7.5	0	0	0	0	0
8.0	0	0	0	0	0	8.0	0	0	0	0	0	8.0	0	0	0	0	0
8.5	0	0	0	0	0	8.5	0	0	0	0	0	8.5	0	0	0	0	0
9.0	0	0	0	0	0	9.0	0	0	0	0	0	9.0	0	0	0	0	0
9.5	0	0	0	0	0	9.5	0	0	0	0	0	9.5	0	0	0	0	0
10.0	0	0	0	0	0	10.0	0	0	0	0	0	10.0	0	0	0	0	0
10.5	0	1	0	0	1	10.5	0	0	0	0	0	10.5	0	1	0	0	1
11.0	0	0	0	0	0	11.0	0	0	0	0	0	11.0	0	0	0	0	0
11.5	0	0	0	0	0	11.5	0	0	0	0	0	11.5	0	0	0	0	0
12.0	0	1	0	0	1	12.0	0	5	0	0	5	12.0	0	6	0	0	6
12.5	0	0	0	0	0	12.5	0	9	0	0	9	12.5	0	9	0	0	9
13.0	0	2	0	0	2	13.0	0	17	0	0	17	13.0	0	19	0	0	19
13.5	0	4	0	0	4	13.5	0	34	0	0	34	13.5	0	38	0	0	38
14.0	0	9	0	0	9	14.0	0	52	0	1	53	14.0	0	61	0	1	62
14.5	0	7	0	0	7	14.5	0	73	0	0	73	14.5	0	80	0	0	80
15.0	0	14	0	0	14	15.0	0	76	0	0	76	15.0	0	90	0	0	90
15.5	0	3	0	0	3	15.5	0	66	0	1	67	15.5	0	69	0	1	70
16.0	0	10	0	1	11	16.0	0	51	0	0	51	16.0	0	61	0	1	62
16.5	0	16	0	0	16	16.5	0	62	0	0	62	16.5	0	78	0	0	78
17.0	0	38	0	2	40	17.0	1	127	0	0	128	17.0	1	165	0	2	168
17.5	0	65	0	1	66	17.5	1	296	0	2	299	17.5	1	361	0	3	365
18.0	0	99	0	2	101	18.0	0	565	2	1	568	18.0	0	664	2	3	669
18.5	0	198	0	2	200	18.5	0	734	0	2	736	18.5	0	932	0	4	936
19.0	0	278	0	1	279	19.0	0	911	3	1	915	19.0	0	1189	3	2	1194
19.5	0	305	0	1	306	19.5	1	678	6	0	685	19.5	1	983	6	1	991
20.0	0	318	1	3	322	20.0	3	465	12	0	480	20.0	3	783	13	3	802
20.5	3	282	1	2	288	20.5	5	328	16	0	349	20.5	8	610	17	2	637
21.0	7	277	6	1	291	21.0	10	274	41	0	325	21.0	17	551	47	1	616
21.5	7	210	14	2	233	21.5	12	227	72	1	312	21.5	19	437	86	3	545
22.0	19	127	35	3	184	22.0	27	181	139	2	349	22.0	46	308	174	5	533
22.5	41	72	68	2	183	22.5	41	111	228	0	380	22.5	82	183	296	2	563
23.0	72	20	114	0	206	23.0	55	62	298	1	416	23.0	127	82	412	1	622
23.5	130	7	159	0	296	23.5	88	28	282	0	398	23.5	218	35	441	0	694
24.0	117	7	117	2	243	24.0	138	7	215	0	360	24.0	255	14	332	2	603
24.5	96	1	86	3	186	24.5	144	5	162	0	311	24.5	240	6	248	3	497
25.0	92	0	84	2	178	25.0	173	3	110	1	287	25.0	265	3	194	3	465
25.5	78	0	67	1	146	25.5	202	0	95	0	297	25.5	280	0	162	1	443
26.0	99	0	43	1	143	26.0	152	1	78	1	232	26.0	251	1	121	2	375
26.5	62	0	33	1	96	26.5	151	1	81	0	233	26.5	213	1	114	1	329
27.0	28	0	28	0	56	27.0	122	0	28	1	151	27.0	150	0	56	1	207
27.5	17	0	6	1	24	27.5	95	0	17	1	113	27.5	112	0	23	2	137
28.0	5	0	3	0	8	28.0	48	0	10	0	58	28.0	53	0	13	0	66
28.5	7	0	2	0	9	28.5	29	0	4	0	33	28.5	36	0	6	0	42
29.0	3	0	0	0	3	29.0	9	0	1	0	10	29.0	12	0	1	0	13
29.5	2	0	0	0	2	29.5	11	0	1	0	12	29.5	13	0	1	0	14
30.0	1	0	0	0	1	30.0	6	0	0	0	6	30.0	7	0	0	0	7
30.5	0	0	0	0	0	30.5	6	0	0	0	6	30.5	6	0	0	0	6
31.0	0	0	0	0	0	31.0	5	0	0	0	5	31.0	5	0	0	0	5
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32.5	0	0	0	0	0	32.5	0	0	0	0	0	32.5	0	0	0	0	0
33.0	0	0	0	0	0	33.0	2	0	0	0	2	33.0	2	0	0	0	2
33.5	0	0	0	0	0	33.5	0	0	0	0	0	33.5	0	0	0	0	0
34.0	0	0	0	0	0	34.0	0	0	0	0	0	34.0	0	0	0	0	0
34.5	0	0	0	0	0	34.5	0	0	0	0	0	34.5	0	0	0	0	0
35.0	0	0	0	0	0	35.0	0	0	0	0	0	35.0	0	0	0	0	0
35.5	0	0	0	0	0	35.5	0	0	0	0	0	35.5	0	0	0	0	0
36.0	0	0	0	0	0	36.0	0	0	0	0	0	36.0	0	0	0	0	0
36.5	0	0	0	0	0	36.5	0	0	0	0	0	36.5	0	0	0	0	0
37.0	0	0	1	0	1	37.0	0	0	0	0	0	37.0	0	0	1	0	1
	887	2371	868	34	4160		1541	5449	1901	16	8907		2428	7820	2769	50	13067