Northwest Atlantic Fisheries Organization

Serial No. N1628 NAFO SCR Doc. 89/50

SCIENTIFIC COUNCIL MEETING - JUNE 1989

The Icelandic Shrimp Fishery (*Pandalus borealis*) in Denmark Strait

by

U. Skúladóttir

Marine Research Institute, Skulagata 4
P. O. Box 1390, 121 - Reykjavik, Iceland

In 1988, the Icelandic fishery was carried out mainly from June onwards. The total catch of the year was 1,424 tons and the mean catch-per-trawling hour (CPUE) was 58 kg as compared to 79 kg of 1987 (see Table 1). The same table shows the effort, catch and catch-per-trawling hour by months for the Icelandic shrimp fishery in the Denmark Strait area in 1987 and 1988. The CPUE appears to have fallen since 1987 both when comparing individual months and the mean. This is in accordance with what was expected as a result from increased fishing in the Denmark Strait area in the past years (Skúladóttir, 1989). On the other hand, one can say that the fishery from the Icelandic side is only on the eastern part of the Denmark Strait banks and the distribution of shrimp may vary from year to year. The mean size of gear used in 1988 was similar to that used in 1987 namely 2385 meshes and 2371 respectively.

In 1988, rather few samples were collected from the Icelandic fishery. There was one from 10 August and a few from about the middle of September. These are shown in Tables 2-4. When comparing the results from this year to those of last year, it must be pointed out that in Table 3 of last year's paper, Hallgrimsson and Skúladóttir (1988), there are errors in the headings of tables. Table 3 shows the promille length distribution of October 1987 instead of September, and Table 5 shows the one for December instead of September.

The males were now about 26% on 10 August (Table 2). The sample was taken both in Strata 17 and 23 using the strata numbers of Smedstad (1987). The strata used by Smedstad can be subdivided into four small strata where e.g. 23-1 and 23-2 lye north of 23-3 and 23-4. The August sample was taken in strata 17-3 and 23-2 From the September samples it can be deduced that males were 33% in stratum 17-3 but only 8% in stratum 23-2. this is similar to previous findings of Hallgrimsson and Skúladóttir 1988 in the same month when males were 31% in 1987 in stratum 17-3 and 10% in stratum 23-2. In September 1985, Smedstad (1986) found that males and intersexes were 43.6% in stratum 17, 25.2% in 1986 (1987) and 36.4% in 1987 (1988), but only 11.5% in 1988 (1989). This last value is much lower than found by Icelandic investigations, but the rest is not too far off. In 1985, there were no data reported from stratum 23, but in 1986 Smedstad reported 17.7% males and intersexes in stratum 23, 39.5% in 1987 and 32.5% in 1988. This is much higher than the 8-10% noted by the Icelandic investigations. It can be said that the mesh size used in the stratified-random surveys of Smedstad are a bit less than used commercially by Icelanders, namely 35 mm open mesh against 38 mm. It is also known that there are no discards on the Icelandic side. It does not make any difference that Smedstad includes transitionals in his proportions of males and intersexes, as there are extremely few at this time of the year. The same applies to immature females (with sternal spines). These are also very scarce in September. So the lower the proportion of males, the higher the proportion of mature females.

Most of the shrimp that were going to spawn this year had already done so by 10 August, namely 96% (Stage 7 divided by Stages 5+6+7). By 15 September, there were no females left with head roes. However, between 20 and 25% of females without sternal spines are not spawning this year (Stage 4 divided by Stage 4+Stage 7). In 1985 and 1986 (Skúladóttir and Hallgrimsson, 1987) there were many small samples taken where the proportion not spawning that year in strata 17 and 23 was on the average of 15.7% in 1985 and 12.1% in 1986. In the same years Smedstad got 32.9% not spawning in stratum 17 in the year 1985 and 19.2% in 1986 in strata 17 and 23 combined. According to Biseau (1984) 11% of ovigerous females had no head roes in the spring. But in 1982 Dupoy (Dupoy *et al.*, 1983) found that 38% of ovigerous females had no head roes in spring. It is however possible that a proportion of those could have shown head roes later in the summer. Smedstad has also shown that there is variation in the proportion spawning every second year,

namely there are higher proportions spawning every second year, the farther north the samples are taken. There might also be some variations between the years.

Reference

Biseau, A., B. Fontaine, and A. Forest. 1984 Catch, effort and biological data of shrimp (*Pandalus borealis*) in the French Fishery off East Greenland in 1983. NAFO SCR Doc. 84/I/7, Serial No. N776, 18 p.

Dupoy, H., P. Derible, and A. Biseau. 1983. Catch, effort and biological characteristics of shrimp (*Pandalus borealis*) in the French Fishery off East Greenland in 1982. NAFO SCR Doc. 83/I/4, Serial No. N642, 21 p.

Hallgrimsson, I., and U. Skúladóttir. 1988. The Icelandic shrimp (*Pandalus borealis*) fishery in the Denmark Strait in 1987. NAFO SCR Doc. 88/64, Serial No. N1506, 10 p.

Skúladóttir, U., and I. Hallgrimsson. 1987. The Icelandic shrimp (*Pandalus borealis*) fishery in the Denmark Strait in 1986. NAFO SCR Doc. 87/04.

Skúladóttir, U. 1989. A review of the shrimp fishery, *Pandalus borealis* in Denmark Strait. NAFO SCR Doc. 89/.14; Serial No. N1613.

Smedstad, O. M. 1986. Preliminary report of a cruise with M/T *Masi* to East Greenland waters in September 1985. NAFO SCR Doc. 86/8, Serial No. N1106, 12 p.

Smedstad, O. M. 1987. Preliminary report of a cruise with M/T *Masi* to East Greenland in September 1986. NAFO SCR Doc. 87/02, Serial No. N1270, 12 p.

Smedstad, O. M. 1988 Preliminary report of a cruise with M/T *Masi* to East Greenland in September 1987 NAFO SCR Doc. 88/48, Serial No. N1488, 10 p.

Smedstad, O. M. 1989. Preliminary report of a cruise with M/T Håkøy-II to East Greenland waters in September 1988. NAFO SCR Doc. 89/19, Serial No. N1595, 11 p.

Table I. Catch of shrimp, effort and kg/hr as reported by Icelandic logbooks, and the other, the nominal catch by month and year in the Denmark Strait.

YEAR	FROM LOGBOOKS EFFORT Tr. hours	CATCH Tons	CPUE kg/hr	NOMINAL CATCH Tons
1987				
July	447	43.7	97.7	85
August	3399	283.6	83.4	373
September	3078	251.4	81.6	359
October	2012	123.3	61.3	309
November	1482	111.8	75.4	115
December	259	27.3	105.6	89
Total 1987	10684	841.2	78.7	1330
1988				
January	23	2.1	90.0	2.4
February	21	0.8	42.1	0.9
June	1463	158.5	108.3	181.7
Σ Jan-Jun	1507	161.4	107.1	185.0
1988				
July	977	45.7	46.8	53.6
August	4596	238.1	51.8	279.5
September	6257	386.1	61.7	453.2
October	7166	372.3	52.0	437.0
November	363	9.5	26.2	11.2
Σ Jul-Nov	19359	1051.7	54.3	1205.5
Total 1988	20866	1213.1	58.1	1424

The legend for the different sex categories of P. borealis examined in Denmark Strait, see tables 2-4:

1 Males
2 Transitionals without head roes.
3 Females with sternal spines, no headroes.
4 Females without sternal spines, no headroes, not berried but at times with egg hairs.
5 Females with sternal spines and with headroes.
6 Females without sternal spines and with headroes.
7 Females berried with no eyespots.
8 Females berried with eyespots.
9 Females berried with eyespots and with headroes.

Table 2. The length distribution by sexual categories of the Icelandic sample taken on the 10th of August 1988 in Denmark Strait.

CL mm	1	3	4	5	6	7	Total
19	1						1
19.5							
20							
20.5	2						2
21							
21.5							
22							
22.5							
23	2						2
23.5	1						1
24	2						2
24.5	1						1
25							
25.5	2						2
26	5					1	6
26.5							
27	4		1			3	8
27.5	4						4
28	7			1	1	1	10
28.5	8					5	13
29	5	1				3	9
29.5	1		2	1		9	13
30			5		1	10	16
30.5			1			13	14
31			3			12	15
31.5			6			11	17
32			3			10	13
32.5			3			7	10
33			4			5	9
33.5			2			3	5
34						1	1
34.5						1	1
35						1	1
Total	45	1	30	2	2	96	176

Table 3. The length distribution by sexual categories of the Icelandic samples taken in September 16th-19th 1988 in Denmark Strait north of 66° 30'.

CL mm	1	3	4	7	Total
19	1				1
19.5					
20	1				1
20.5	1				1
21	1				1
21.5	1				1
22	1				1
22.5	1				1
23	2				2
23.5	6				6
24	6				6
24.5	5				5
25	7				7
25.5	5				5
26	7	1			8
26.5	5			2	7
27	9			3	12
27.5	10		2	5	17
28	17		1	6	24
28.5	14		1	6	21
29	6		4	16	26
29.5	4		3	17	24
30	5		9	24	38
30.5	1		9	21	31
31			11	23	34
31.5	1		9	16	26
32			7	18	25
32.5			2	6	8
33			2	3	5
33.5			1	6	7
34				2	2
34.5				3	3
35			1	2	3
35.5				1	1
Total	117	1	1 61	180	359

Table 4. The length distribution by sexual categories of the Icelandic sample taken in September 15th-20th 1988 in Denmark Strait south of 66° 30´.

CL mm	1	4	7	Total
21	1			1
21.5				
22				
22.5				
23				
23.5				
24				
24.5	1		1	2
25	2			2
25.5				
26				
26.5				
27		1	1	2
27.5			1	1
28	2		1	3
28.5	2		2	4
29	2		7	9
29.5		4	4	8
30			11	11
30.5		2	9	11
31		4	11	15
31.5		3	10	13
32		4	10	14
32.5		3	15	18
33		1	4	5
33.5			2	2
34		1	3	4
Total	10	23	92	125