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Estimate of shrimp discard from shrimp factory trawlers
in Davis Strait and Denmark Strait in 1991

by

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INTRODUCTION

The offshore shrimp quota in the Greenland zone is distributed to the vessels as boat-licences, and as the capacity of the fleet for the moment is well above the TAC, there is an economic incentive to discard the lower priced small shrimp.

In 1990 an observer program was initiated to estimate the unreported amount of discarded shrimp from the larger trawlers with production lines onboard. The program was continued in 1991 and 1992.

This paper updates an earlier work by Lehmann & Degel (1991) by including observations from 1991.

MATERIAL AND METHODS

In 1991, two observers visited a number of vessels throughout the year. For practical reasons two main areas of fishing at West Greenland were considered in the sampling, Div. 1B and 'other' areas (1A, 1C-1F). The observers obtained samples from Div. 1B in the third and fourth quarter of the year, and from other areas in quarters two, three and four. At East Greenland sampling was carried out during the first five months of 1991 only.

As in 1990, samples were taken both from the unsorted catch, and from the different production categories after sorting by grading machines. The carapace length (CL) of the shrimp was measured to the nearest 0.1 mm and later grouped into 0.5 mm groups for further calculations.

The shrimp samples from the observers were used together with logbook information on the landed amount of different production categories to estimate the total discard of small shrimp. No change in the method used has been made (Lehmann & Degel, loc. cit.), but new information on size distributions in the different production categories have been included in the calculations (Table 1).

RESULTS

Tables 2 and 3 summarize calculated discards for different areas and quarters for 1990 and 1991, respectively. Size distribution of the unsorted catches in quarters not covered by the observer sampling have been taken from the nearest available quarter in the same main area (Fig. 1-2).

Estimated discards were fairly uniform over the year within the main areas at West Greenland. A reduced discard is indicated for Div. 1B from 1990 to 1991, opposite to 'XB' (other than 1B), which exhibits increased discard, mainly in the first six months of 1991. The estimated discard for the East Greenland area has increased by 50% from 1990 to 1991 (January-June).

Figures 1-3 display the size distributions of the catches (before sorting), landings (after production) and estimated discard of smaller shrimp below a set upper size limit for this type of discard (22 mm CL at West Greenland, 27 mm CL at East Greenland).

In this work no attempt has been made to estimate the magnitude of discard of low quality shrimp. This type of discard is known to vary considerably over the season, earlier estimated to be 6-7% at average for all areas and months.

REFERENCES

K. Lehmann & H. Degel, 1991. An estimate of shrimp discard from factory trawlers in Davis Strait and Denmark Strait. NAFO SCR Doc. 91/40. Serial No. N1920.

Table 1. Values for mean length (CL) and corresponding standard deviation for each production category in the commercial fishery used for reconstructing length frequencies of the reported landings of shrimp.

Production Category	Mean	St.err	Status
Count	mm.		
40-50	34.2	1.3000	estimated
40-60	33.0	2.3000	estimated
50-60	31.9	1.0000	estimated
50-70	31.0	1.8000	estimated
55-60	31.5	0.5000	estimated
60-70	30.2	0.8000	estimated
60-80	29.4	1.5000	estimated
65-70	29.8	0.4000	estimated
70+	27.0	3.0000	estimated
70-80	28.7	0.7000	estimated
70-90	29.1	1.5000	calculated
70-100	27.5	1.7000	estimated
75-80	28.4	0.3000	estimated
80-90	27.5	0.6000	estimated
80-100	26.8	1.3000	calculated
80-105	26.9	1.3000	estimated
80-110	26.5	1.5000	estimated
90+	25.4	3.1000	calculated
90-100	26.5	0.5000	estimated
90-105	26.3	0.7000	estimated
90-110	26.0	0.9000	estimated
90-115	26.5	1.3000	calculated
90-120	25.3	1.5000	calculated
95-105	26.0	0.5000	estimated
100+	24.0	3.0000	estimated
100-170	24.8	1.1000	estimated
100-150	24.1	1.7000	estimated
100-160	23.8	1.9000	estimated
110+	23.0	2.0000	estimated
105-115	25.2	0.4000	estimated
110-130	24.5	0.7000	estimated
110-150	23.8	1.3000	estimated
110-160	23.5	1.5000	estimated
115-118	24.6	0.2000	estimated
120+	22.4	1.9000	calculated
120-150	23.0	1.1000	calculated
120-160	23.2	1.2000	estimated
120-170	22.9	1.4000	estimated
120-180	22.7	1.6000	estimated
140+	19.8	2.5000	estimated
150+	19.5	1.8000	calculated
160-300	19.2	2.5000	estimated
170+	18.5	3.0000	estimated
170-	23.0	2.0000	estimated
180+	18.5	3.0000	estimated
Japan	31.0	1.8000	estimated
Italy	24.5	1.0000	estimated

Table 2. Estimated discards in commercial fishery in 1990. Figures are given for two areas at West Greenland (Div. 1B and other areas: 'XB') in quarters, and for the total fishing area at East Greenland in semiannual periods.

DIV	Quarter	Reported catch	Calc. catch	Weight disc.	Number disc.	Reported catch + disc.	Discard of calc. catch	Discard of rep. catch + disc.
		(t)	(t)	(t)	(*1E-6)	(t)	(%)	(%)
1B	I 1)	171	350	105		276	30.0	38.0
1B	II	3634	8465	3024	708.3	6658	35.7	45.4
1B	III	2838	5630	1585	366.0	4423	28.2	35.8
1B	IV	2955	5511	1382	287.8	4337	25.1	31.9
1B	TOTAL	9598	19956	6096	1362.1	15694	30.5	38.8
XB 2)	I 1)	2878	5073	812		3690	16.0	22.0
XB 2)	II 1)	5339	9411	1505		6844	16.0	22.0
XB 2)	III	4866	7894	703	132.4	5569	8.9	12.6
XB 2)	IV	3984	7310	1696	303.5	5680	23.2	29.9
XB 2)	TOTAL	17067	29688	4716	435.9	21783	15.9	21.6
Westgrl.	TOTAL	26665	49644	10812	1798.0	37477	21.8	28.8
Eastgrl.	I + II	5385	9958	919	127.9	6304	9.2	14.6
Eastgrl.	III + IV	972	1478	115	15.9	1087	7.8	10.6
Eastgrl.	TOTAL	6357	11436	1034	143.8	7391	9.0	14.0

1) Discard estimated based on average discard for the same area.

2) XB include divisions 1A, 1B, 1C and 1E.

Table 3. Estimated discards in commercial fishery in 1991. Figures are given for two areas at West Greenland (Div. 1B and other areas: 'XB') in quarters, and for the total fishing area at East Greenland in semiannual periods.

DIV	Quarter	Reported catch	Calc. catch	Weight disc.	Number disc.	Reported catch + disc.	Discard of calc. catch	Discard of rep. catch + disc.
		(t)	(t)	(t)	(*1E-6)	(t)	(%)	(%)
1B	I 1)	53	91	17	3.5	70	18.7	24.1
1B	II 1)	2225	3665	703	142.0	2928	19.2	24.0
1B	III	4641	7309	1317	269.4	5958	18.0	22.1
1B	IV	6084	9868	1856	362.8	7940	18.8	23.4
1B	TOTAL	13003	20932	3894	777.7	16897	18.6	23.0
XB 3)	I 2)	4235	9250	2702	501.2	6937	29.2	38.9
XB 3)	II	2225	4659	1257	232.6	3482	27.0	36.1
XB 3)	III	6114	9642	1342	265.0	7457	13.9	18.0
XB 3)	IV	6174	9609	1317	263.5	7491	13.7	17.6
XB 3)	TOTAL	18749	33160	6618	1262.2	25366	20.0	26.1
Westgrl.	TOTAL	31752	54093	10511	2040.0	42263	19.4	24.9
Eastgrl.	I + II	3640	6449	840	127.7	4480	13.0	18.7

1) Samples from 1B, 3 quarter used in the calculation

2) Samples from XB, 2 quarter used in the calculation

3) XB include divisions 1A, 1C, 1D, 1E

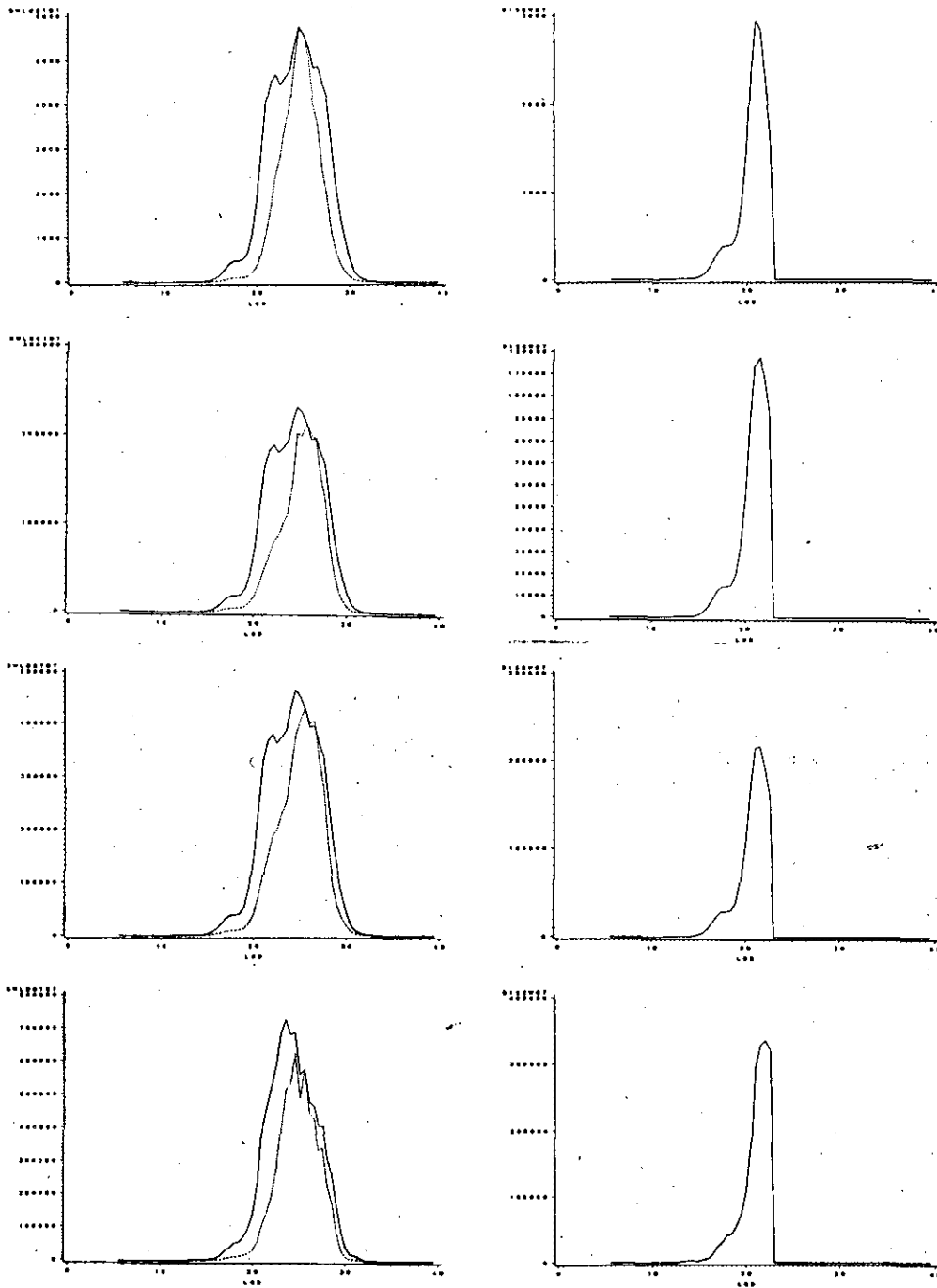


Figure 1. Size distributions of catch (left column, solid line), landings (left column, broken line) and size discard (right column) of shrimp in Div. 1B, quarters 1-4, 1991.

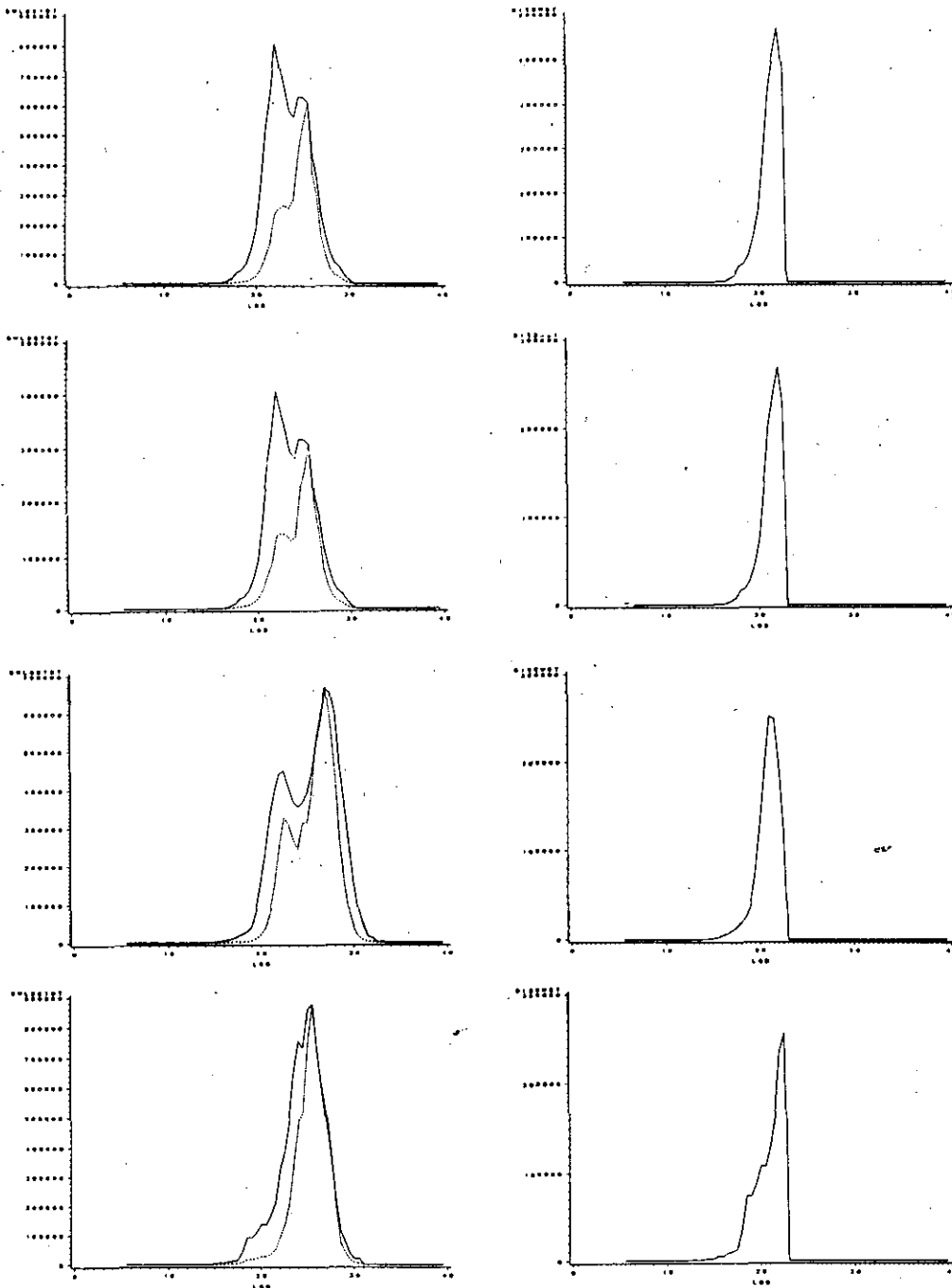


Figure 2. Size distributions of catch (left column, solid line), landings (left column, broken line) and size discard (right column) of shrimp in Div. XB (1A, 1C, 1D and 1E), quarters 1-4, 1991.

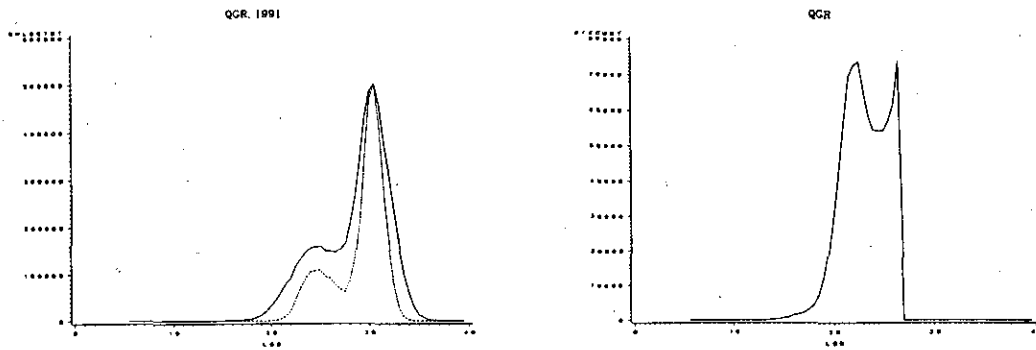


Figure 3. Size distributions of catch (left column, solid line), landings (left column, broken line) and size discard (right column) of shrimp in East Greenland, January-June, 1991.