Northwest Atlantic ⬡ Fisheries Organization

SCIENTIFIC COUNCIL MEETING - JUNE 1993

An esitmate of Shrimp Discard from Shrimp Factory Trawlers in Davis Strait 1992

by

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ABSTRACT

Size distribution of the shrimp catches and of the productions of factory trawlers were estimated by sampling in Davis Strait in 1992. Shrimp discards were estimated by comparing size distributions of the catches with those of all size categories kept.

The factory trawlers discard of shrimp in Davis Strait in 1992 was estimated at approximately 7,000 tons. The quantity of discarded shrimp in 1991 was estimated at a minimum of 9,200 tons and 11,000 tons in 1990. The level of discard in 1992 is not comparable to those of 1990 and 1991, since Greenland vessels were allowed in excess of vessels-quatas to land about 10,000 tons of small shrimp.

1. INTRODUCTION

The offshore shrimp quota in Greenland is distributed to the vessels as boat-licences. The catching capacity of the fleet is well above the quotas, which increase the incentive to discard of the lower priced small shrimp.

The observer program, initiated in 1990 to estimated shrimp discarding practices in Subarea 1, was continued in 1991 and 1992. This paper updata previous work by including observations from 1992. Based on new information on length distribution in productioncategory, the 1991 data is reevaluated - also included in this paper.

No attempt has been made to estimate the magnitude of discard of low quality shrimp, and due to inadequate sampling, no estimate on discard from Eastgreenland is presented in 1992.

2. DATA AND MATERIAL

Observers obtained samples in 1992 from factory trawlers in Div.1C and Div.1D in the second and third quarter of the year, and from Div. 1A in the fourth quarter.(Table 1.) No change in sampling procedure has been made since 1990 (Lehmann & Degel, 1990).

The logbook included information on location of the fishery and quantities of landed shrimp by size groups. The samples from the observer program on catch (unsorted) and the production category (sorted) were used together with logbook information on the landed amount of each categories to estimate the total discard of small shrimp.

The mean and standard deviation for each production catogory have been estimated based on pooled data from all tree years (appendix 1).

3. ESTIMATION OF DISCARD

Samples from 1992 contain new information on the length distribution in one of the productions category indicating a change in sorting procedure onboard factory trawlers. The category "industry" was in 1990 assumed to be non-sorted, having a length distribution equal to the length distribution in the catch.

The 1992 samples show that this category had been sorted, with a distinct cut-off about 23 mm carapace length. Ad notam a new calculation was introduced for the 1992 data - a calculation based on the same theory as describe in Lehman and Degel 1990. The sorting of shrimp on factory trawlers in 1991 is assumed to be similar to the 1992 situation and the estimates has therefore been reconsidered.

The estimate for 1992 is, as previous years, based on the assumption, that only shrimp with a carapace length less than 23 mm is discarded.

4. RESULT

Calculated discards for different areas and quarters for 1992 are listed in table 2. The logbook information, calculated catch and calculated discard are tabulated in tons, and the discard in procent of calculated catch. Size distribution of unsorted catches in quarters not covered by the observers sampling have been taken fra the nearest available quarter in the same main area.

Reported catches from the landingproject is listed in table 3 by division and month.

In 1991 estimated discard was calculated for two areas: 1B and all others areas 'XB'. Table 4 summarises data from 1991 and 1992.

Table 5 summarise figures from 1991 and 1992.

Figures 1-4 display the size distributions of the catches-curve (before sorting) and landings-curve (after production). The vertical line (dot) at 23 mm, illustrate the upper level at which discarding is assumed to happend.

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REFERENCES

Lehman, K & H. Degel. 1991. An estimate of shrimp discard from factory trawlers in Davis Strait and Denmarks Strait. NAFO SCR. Doc. 91/40. Seriel No. NI920.

Carlsson, D.M. & P. Kanneworff. 1992. Estimate of shrimp discard from shrimp factory trawlers in Davis Strait and Denmark Strait in 1991.NAFO SCR. Doc. 92/56. Serial No. N2109.

Table 1. Coverage of samplings from 1990-1992 divided by Division and quarters. Figures represent numbers of hauls sampled.

DIVI	1990				1991				1992			
	I	II	III	IV	I	II	III	IV	I	II	III	IV
1A	-	-	89	-	-	-	42	-	-	-	-	45
1B	-	44	46	134	-	-	52	22	-	-	-	-
1C	-	-	-	5	-	4	-	11	-	6	13	-
1D	-	-	-	-	-	20	-	12	-	44	43	-
1E	-	-	-	-	-	-	-	-	-	-	-	-
1F	-	-	-	-	-	-	-	-	-	-	-	-
14AB	105		64		222				20			

Table 2. Estimated discard in commercial fishery in Westgreenland in 1992. Figures are given for all areas at West Greenland in quarters.

1992 West DIVISION	I-quarter				II-quarter				III-quarter				IV-quarter			
	log catch(t)	calc. catch(t)	weight disc.(t)	disc.% of calc. catch(t)	log catch(t)	calc. catch(t)	weight disc.(t)	disc.% of calc. catch(t)	log catch(t)	calc. catch(t)	weight disc.(t)	disc.% of calc. catch(t)	log catch(t)	calc. catch(t)	weight disc.(t)	disc.% of calc. catch(t)
1A	0	0	0		4	4			2365	2605	199	7.6	2862	3647	526	14.4
1B	741	822	89	10.8	1624	1797	181	10.1	4342	4392	304	6.9	4198	5190	678	13.1
1C	1900	2502	448	17.9	3372	4272	750	17.6	2275	2893	414	14.3	1388	1986	340	17.1
1D	2009	2497	442	17.7	3910	5077	929	18.3	2843	3681	568	15.4	2531	3242	469	14.5
1E	472	615	111	18.0	396	492	80	16.3	640	894	156	17.4	1182	1577	230	14.6
1F	6	6	-		0	0	0		1	1	-		0	0	0	
SUM	5128	6442	1090	16.9	9306	11642	1940	16.7	12466	14466	1641	11.3	12161	15642	2243	14.3

Table 3. Shrimp catches by division and area form vessels operated during the landingsproject.

Div	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Total
1B			9	7	105	3	2020	158	591	434			3327
1C			450	327	79	942	725	115	111	352	155		2904
1D			255		124	261	195	841	309	507	661		2998
1E			78		9			382	5		377		1358
SUM			792	334	317	1206	2940	1496	1016	1293	1193		10587

Table 4. Estimated discards in commercial fishery in 1992 and 1991 at West Greenland for two areas (Div. 1B and other areas: 'XB')

	DIVISION	I-quarter				II-quarter				III-quarter				IV-quarter			
		log catch(t)	calc. catch(t)	weight disc.(t)	disc.% of calc. catch(t)	log catch(t)	calc. catch(t)	weight disc.(t)	disc.% of calc. catch(t)	log catch(t)	calc. catch(t)	weight disc.(t)	disc.% of calc. catch(t)	log catch(t)	calc. catch(t)	weight disc.(t)	disc.% of calc. catch(t)
1992	1B	741	822	89	10.8	1624	1797	181	10.1	4342	4392	304	6.9	4198	5190	678	13.1
	XB	4387	5620	1001	17.8	7682	9845	1759	17.9	8124	10074	1337	13.3	7963	10452	1565	15.0
CALCUL	SUM	5128	6442	1090	16.9	9306	11642	1940	16.7	12466	14466	1641	11.3	12161	15642	2243	14.3
1991	1B	54	54	-	0.0	2225	2680	361	13.5	4641	5296	624	11.8	6084	7616	1146	15.0
NEW	XB	4235	6900	1893	27.4	6311	9160	2167	23.7	6114	8645	2060	23.8	6174	8097	984	12.2
CALCUL	SUM	4289	6954	1893	27.2	8536	11840	2528	21.4	10755	13941	2684	19.3	12258	15713	2130	13.6
1991	1B	53	91	17	18.7	2225	3665	703	19.2	4641	7306	1317	18.0	6084	9868	1856	18.8
OLD	XB	4235	9250	2702	29.2	6311	4659	1257	27.0	6114	9642	1342	13.9	6174	9609	1370	14.3
CALCUL	SUM	4288	9341	2719	29.1	8536	8324	1960	23.5	10755	16948	2659	15.7	12258	19477	3226	16.6

Table 5. Estimated discard in 1992 and 1991. Figures
are given for West Greenland in 1992 and 1991

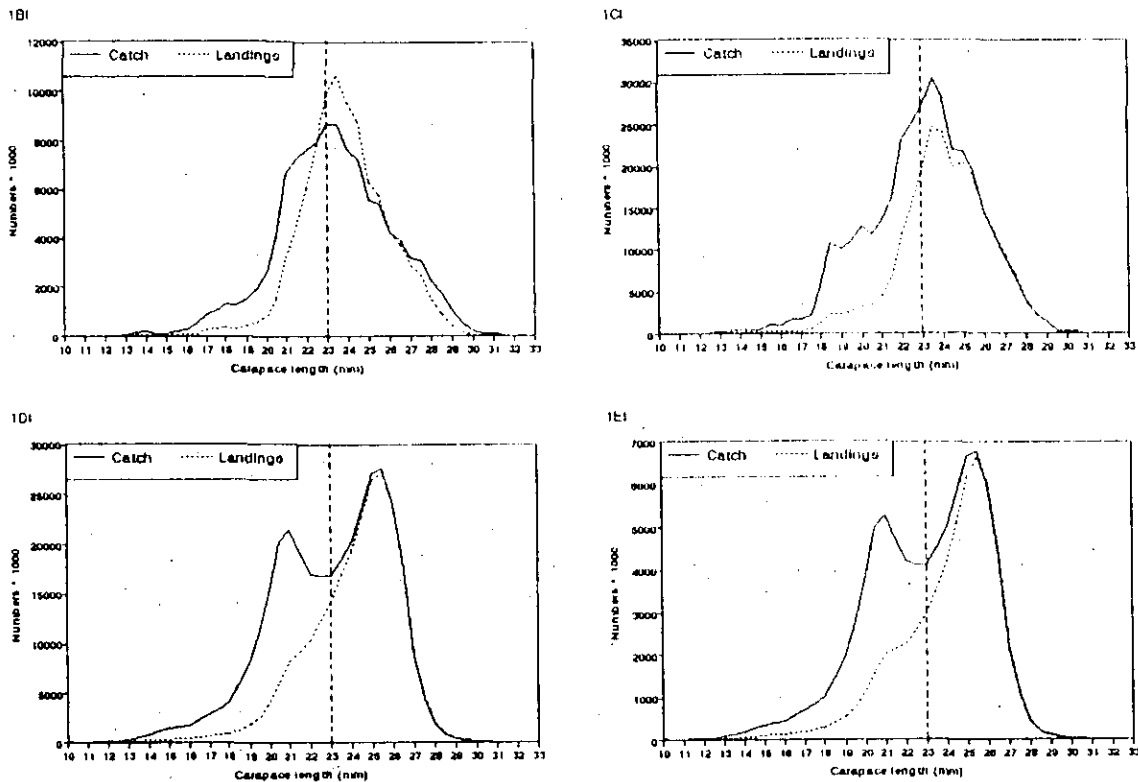|	REPORTED CATC	CALCULATED CA	DISCARD	DISCAR
	tons	tons	tons	%
1992	39061	48192	6914	14.3
1991 NEW	35838	48448	9235	19.1
1991 OLD	35837	54090	10564	19.5

Figure 1. Size distributions of catch (solid line) and landings (broken
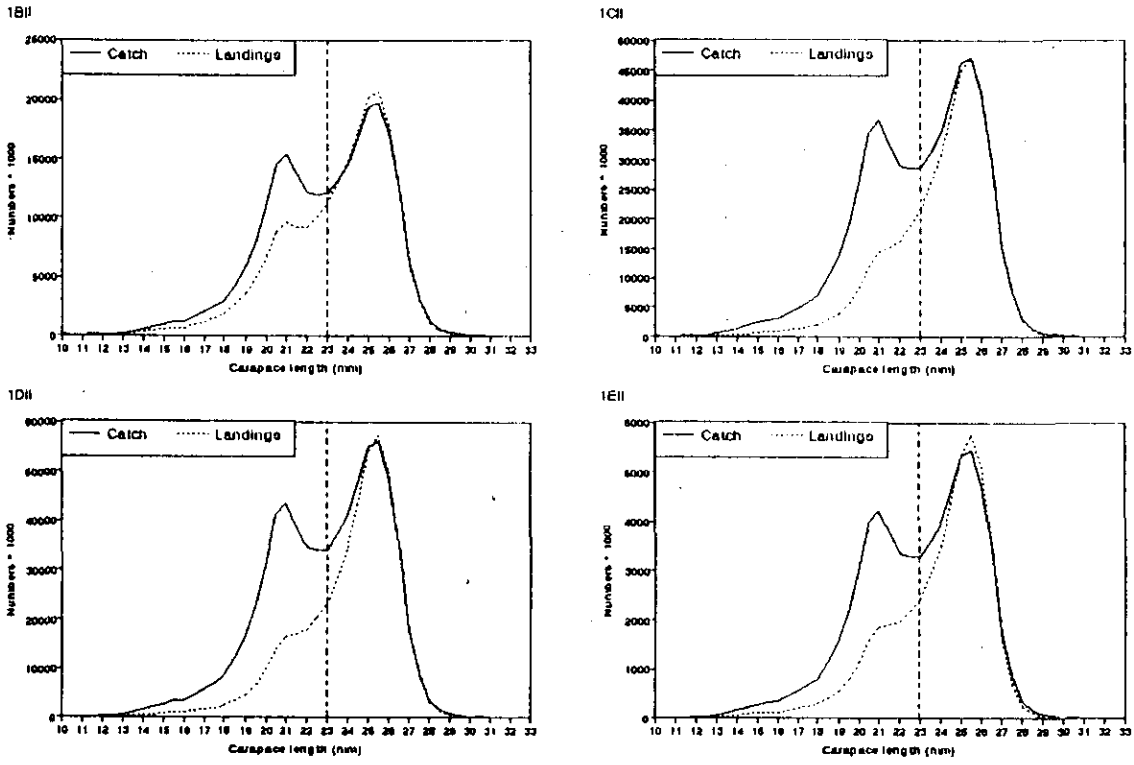line) of shrimp in NAFO Div., 1.quarter, 1992.

Figure 2. Size distributions of catch (solid line) and landings (broken line) of shrimp in NAFO Div., 2.quarter, 1992.
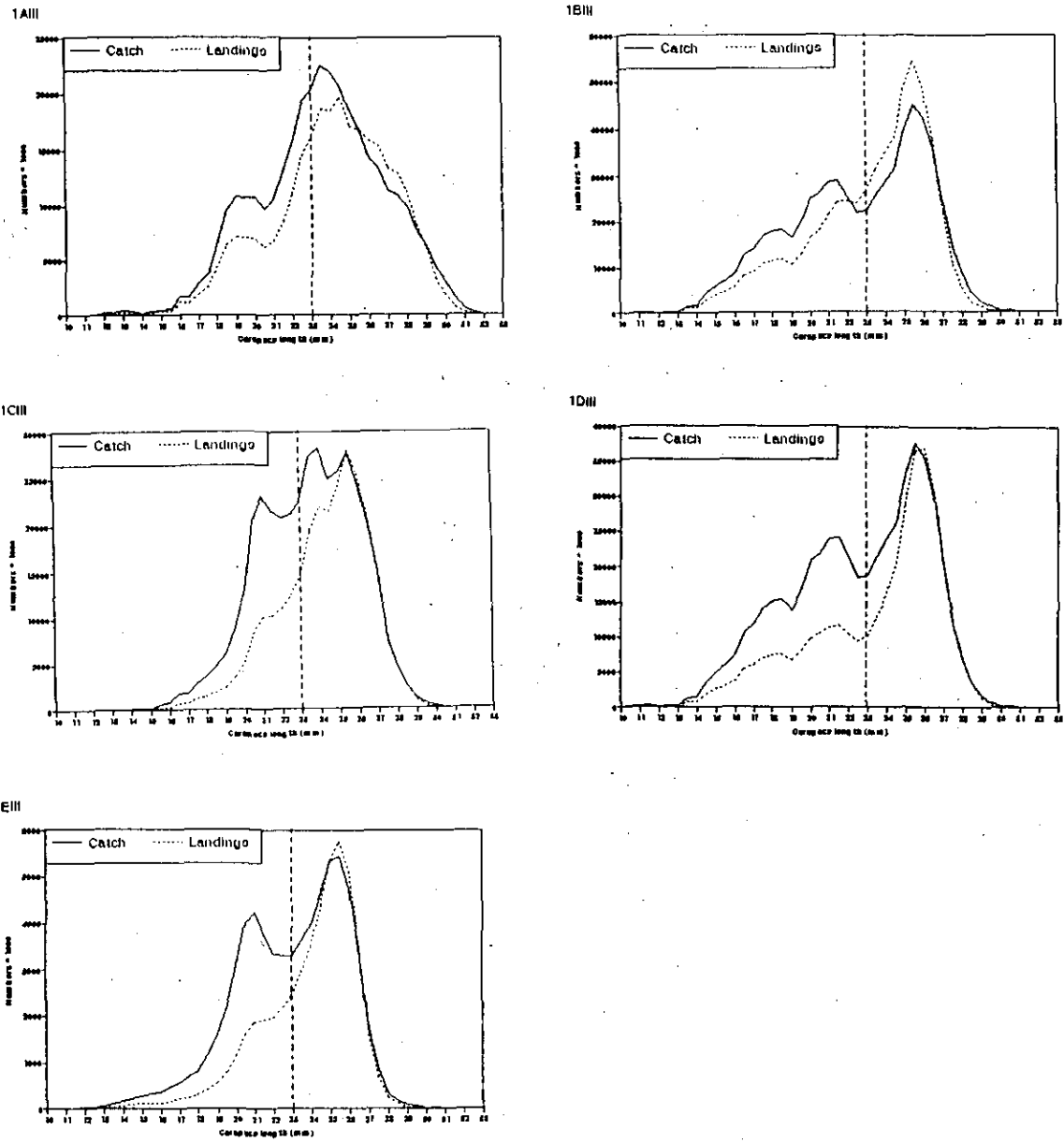
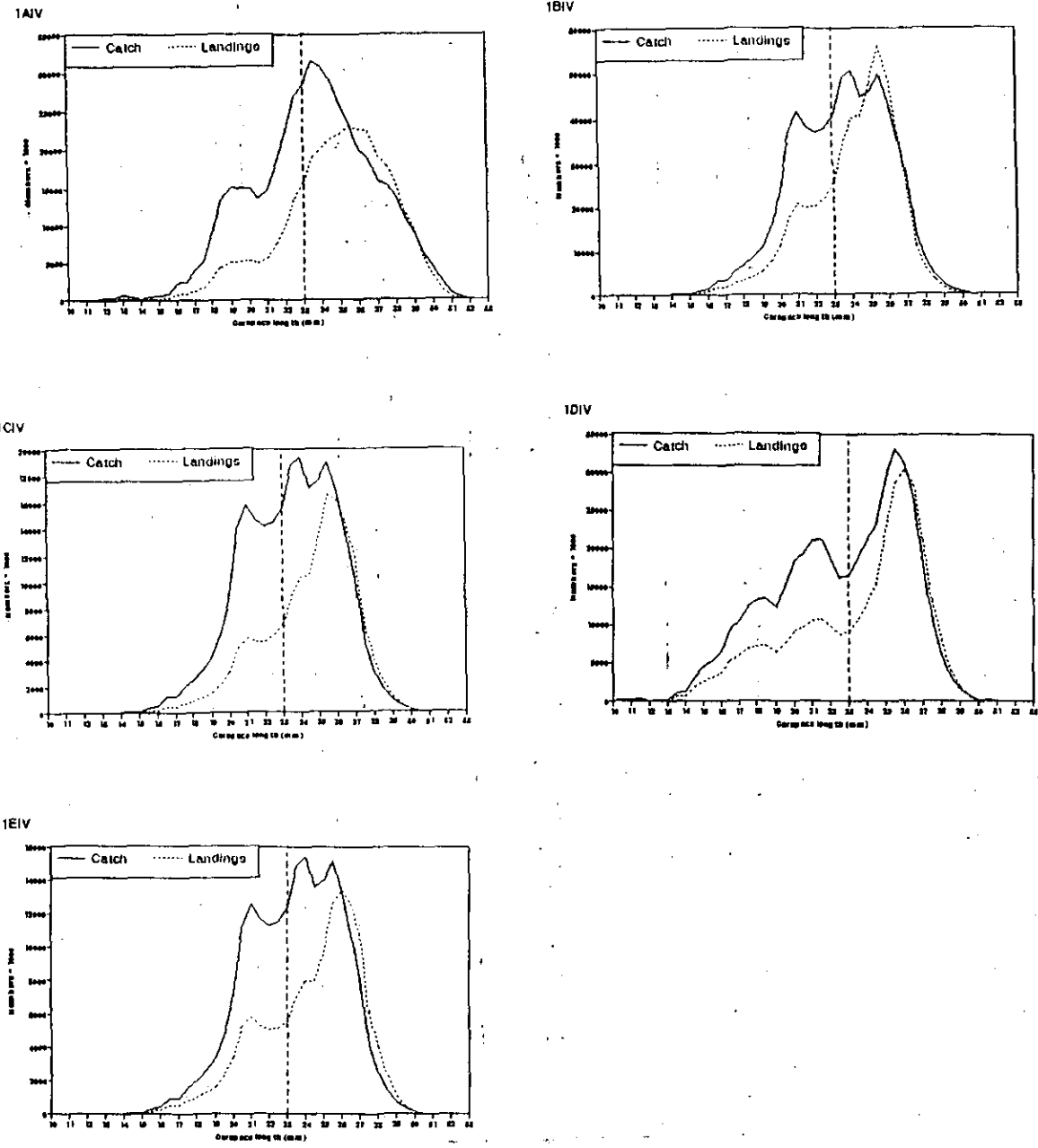Figure 3. Size distributions of catch (solid line) and landings (broken line) of shrimp in NAFO Div., 3.quarter, 1992.

Figure 4. Size distributions of catch (solid line) and landings (broken
line) of shrimp in NAFO Div., 4.quarter, 1992.

	Production Category (count)	Mean mm	St.err.	Status
00	40-50	34.2	1.3	estimated
01	40-60	31.9	1.0	calculated
03	50-60	31.9	1.2	calculated
02	50-70	31.4	1.6	calculated
04	55-60	31.5	0.5	estimated
05	60-70	29.8	1.0	calculated
06	60-80	29.6	0.9	calculated
07	65-70	29.5	0.4	estimated
11	70-80	28.7	0.7	estimated
12	70-90	28.2	1.7	calculated
13	70-100	27.5	1.7	estimated
15	75-80	28.4	0.3	estimated
20	80-90	27.5	0.6	estimated
21	80-100	26.4	1.3	calculated
23	80-105	26.7	1.3	estimated
22	80-110	26.7	1.3	calculated
25	90+	25.5	2.6	calculated
26	90-100	24.5	1.9	calculated
27	90-105	26.3	0.9	calculated
28	90-110	25.5	1.2	calculated
29	90-115	25.7	1.1	calculated
30	90-120	25.0	2.2	calculated
31	90-160	24.5	2.5	estimated
32	90-170	24.0	2.5	estimated
34	95-105	26.0	0.5	estimated
35	100+	22	2.0	calculated
36	100-105	24	1.0	estimated
37	100-130	23.7	2.5	calculated
38	100-150	23.8	1.7	estimated
39	100-160	23.6	1.9	estimated
40	110+	23.1	1.7	calculated
41	110-150	23.8	1.3	estimated
42	110-160	23.5	1.5	estimated
43	110-130	24.5	0.7	estimated
45	105-115	25.2	0.4	estimated
46	115-120	24.6	0.2	estimated
50	120+	20.9	3.0	calculated
51	120-150	23.3	1.2	calculated
52	120-160	23.2	1.5	estimated
53	120-170	22.9	1.6	estimated
54	120-180	22.7	1.7	estimated
55	120-200	22.7	2.0	estimated
60	140+	19.8	2.5	estimated
65	150+	18.9	1.9	calculated
66	150-180	21.3	1.5	estimated
67	150-200	21.0	2.0	estimated
72	160-300	19.2	2.5	estimated
73	170+	18.5	3.0	estimated
74	170-	23	2.0	estimated
75	180+	18.5	3.0	estimated
76	200-240	18	3.0	estimated
80	Japan	31	1.8	estimated
81	Italien	23.0	3.0	estimated
82	Block	20.3	2.4	estimated
83	Industri	20.3	2.4	calculated

Values for mean length and corresponding standard deviation for each production category in the commercial fishery used for reconstructing length frequencies for the reported landings (1990-1992 pooled).