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Results for Greenland Halibut of the Spanish Survey in NAFO Divisions 3NO: Biomass, Length Distribution and Age Distribution for the Period 1997-2004

by

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Abstract

Greenland halibut (*Reinhardtius hippoglossoides*) indices from the bottom trawl survey that Spain carries out in spring since 1995 in Divisions 3NO of the NAFO Regulatory Area are presented. Biomass, length and age distribution are presented since 1997, year in that the survey extends the depth strata. In 2001, the R/V *Vizconde de Eza* replaced the C/V *Playa de Menduíña* in the realization of the survey. We present the transformed to the R/V *Vizconde de Eza* series for the period 1997-2000, and the original obtained data for the period 2002-2004. In 2001, there are data from the two vessels. This species presents a decreasing trend along the period. It seems not to be recuperation of the stock. But in last years it can be seen a presence of juveniles, mainly last year.

Material and Methods

Since 1995, Spain carries out a spring-summer survey in the NAFO Regulatory Area of Div. 3NO on board the C/V *Playa de Menduíña* with a net trawl type *Pedreira*. In 2001, this vessel was replaced by the R/V *Vizconde de Eza*, using a trawl net type *Campelen*. To know more details about the technical specifications of the surveys, see Walsh *et al.*, 2001.

In 1995 and 1996 only the less deeper strata was surveyed, so these years are not representative for this species. So, we start the series of Greenland halibut in 1997. In Table 1, we present the number of valid tows, the depth strata covered and the dates of the survey series (1997-2004).

To convert the historic series of the old vessel in the indices of the new vessel, in 2001 a series of 90 paired hauls were performed; 7 of them are from the Canadian survey from the comparative experience with the R/V *Wilfred Templeman*. The indices of the major species, including the Greenland halibut, were transformed: mean catch, biomass and length distribution. We used two different methods, one for the biomass (calculation of the Factor Power Correction, FPC, by the method developed by Robson) and another one for the length distribution (method of Warren). More details, in González Troncoso *et al.*, 2004.

These data are presented transformed to the new vessel indices between 1997 and 2000, and the original data is presented in the period 2002-2004. In 2001, there are data from the two vessels. There were a few strata in which the R/V *Vizconde the Eza* did not prospect, so in this strata the transformed data from the C/V *Playa de Menduíña* were presented. Besides this, there are five hauls made by the commercial vessel in strata surveyed by the research vessel, too. The data were transformed and added to the data. Those hauls were missing last years, so the indices can change regarding the last data presented.

So, we present per haul the mean catch, the stratified mean catch and the biomass with their variance per year; the length distribution in number per haul stratified mean catches per length, sex and year; and per age the age numbers, the mean length and the mean weight per haul stratified mean catches. The age numbers were calculated starting from the length distribution per haul stratified mean catches applying the otholit numbers for age-length keys. Weight at age was calculated by applying the length/weight relationship for each year to the mean length.

Results

Greenland halibut are widely distributed in the Grand Bank in the Subarea 2 and Div. 3KLMNO. Canada carries out annual surveys in all the area since 1978, although not all the years were covering all the Subareas. All analysis indicated that in the recent period, stock biomass (5+) is estimated to be at the lowest level in the time series. In Div. 2J and 3K, where most Greenland halibut presence occurs nowadays, the biomass declined since mid-1980s and reached its lower level in early 1990s. Between 1995 and 1999, the stock had increased, approaching near historic high of the early 1980s, due to several good successive year-classes particularly in 1993-95. But since 1999 the biomass began to decline, and in 2002 it reached its lowest value since early-1990s. Since 1982, the Greenland halibut grater than 70 cm declined, and in 1991 virtually no individuals of this size range were appeared. Since 1991, this value continues to be at or near cero. Regarding the recruitment, after the strong years-classes for 1993-95, the year-classes between 2000 and 2002 appear to be near or above average for young ages (Dwyer *et al.*, 2004; Darby *et al.*, 2004).

Mean catches and biomass of Greenland halibut

Table 2 show the swept area, the tow number, the mean catches and their variance per haul and year to Greenland halibut. In Table 3 and Fig. 1 we present the stratified mean catches per stratum with the total variance per year. Table 4 and Fig. 2 present the biomass per swept area per stratum and their total variance per year, as the biomass corresponding with the ages 5+ and 10+. In Table 5 we present the length-weight relationship parameters a and b.

The biomass of the Greenland halibut has decreased since the year 1999. At this moment, the biomass is much below the level of 1997. As the Canadian data, our lowest data is in 2002. The stock seems not to recover.

Length distribution of Greenland halibut

Table 6 presents the length distribution in number per stratified mean catch by haul for the Greenland halibut, by sex and year, with the number of samples in which there was length measures, the total number of individuals measured in these samples, the sampled catch and the range of lengths met, as the total catch of this species and the total hauls made in the survey. In Fig. 3 and 4 we can follow the evolution along the years. We can follow a cohort since 1997 until 2001, but since then no good new cohorts can be seen, although there was recruitment. But the highest recruitment was last year, 2004. We must wait until this year to see the evolution of this recruitment.

Age numbers of Greenland halibut

We present the abundance at age per stratified mean catch by haul in the Table 7, by sex and year. Individuals between 0 and 20 years were caught in the period 1997-2004, although in last years (most since 2002) younger individuals were caught. Perhaps it can be due to the change of gear and/or vessel. We can follow three good cohorts in our series, the 1994-1996 cohorts (ages 1, 2 and 3 in 1997). Cohorts from following years seem to be weaker than those ones, but more constant. And 2002-2003 cohorts appear to be quite strong, as we can see in recent years, especially 2003 one.

Mean length and mean weight of Greenland halibut

Mean length and weight at age by sex over time are presented in Tables 8 and 9, and shown in Fig. 5 and 6. It seems that the greatest ages were increasing their mean length and weight last years, and falling in the youngest individuals.

References

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TABLE 1.- Spanish spring bottom trawl surveys on NAFO Div. 3NO: 1997-2004

Year	Vessel	Valid tows	Depth strata covered (m)	Dates
1997	C/V *Playa de Menduíña*	128	56-1280	April 26-May 18
1998	C/V *Playa de Menduíña*	124	56-1464	May 06-May 26
1999	C/V *Playa de Menduíña*	114	56-1464	May 07-May 26
2000	C/V *Playa de Menduíña*	118	56-1464	May 07-May 28
2001(*)	R/V *Vizconde de Eza*	83	56-1116	May 03-May 24
	C/V *Playa de Menduíña*	121	56-1464	May 05-May 23
2002	R/V *Vizconde de Eza*	125	56-1464	April 29-May 19
2003	R/V *Vizconde de Eza*	118	56-1464	May 11-Jun 02
2004	R/V *Vizconde de Eza*	120	56-1464	Jun 06 – Jun 24

(*) We took, for the calculation of the series, 83 hauls from the R/V *Vizconde de Eza* and 40 hauls from the C/V *Playa de Menduíña* (123 hauls in total)

TABLE 2.- Swept area, number of hauls and Greenland halibut mean catch (kg) and SD (**) by stratum. Spanish Spring Surveys on NAFO Div. 3NO: 1997-2004. Swept area in square miles. n.s. means stratum not surveyed. 1997-2000 data are transformed C/V *Playa de Menduíña* data, and 2002-2004 data are original from R/V *Vizconde de Eza.* In 2001, there are data from the two vessels.

	1997				1998				1999				2000			
			G. halibut				G. halibut				G. halibut				G. halibut	
Stratum	Swept area	Tow number	Mean catch	G. halibut SD	Swept area	Tow number	Mean catch	G. halibut SD	Swept area	Tow number	Mean catch	G. halibut SD	Swept area	Tow number	Mean catch	G. halibut SD
353	0.0480	4	0.06	0.053	0.0465	4	1.37	1.274	0.0360	3	0.61	0.569	0.0356	3	0.19	0.178
354	0.0233	2	0.70	0.095	0.0356	3	2.36	1.246	0.0218	2	0.86	0.781	0.0356	3	0.11	0.057
355	0.0233	2	4.07	0.230	0.0221	2	0.29	0.066	0.0229	2	0.22	0.295	0.0233	2	0.22	0.274
356	0.0225	2	4.11	1.871	0.0221	2	4.27	4.759	0.0229	2	0.23	0.174	0.0225	2	0.49	0.043
357	0.0443	4	1.08	1.341	0.0240	2	8.40	6.433	0.0236	2	1.69	0.276	0.0124	1	0.11	-
358	0.0563	5	1.38	1.168	0.0236	3	2.35	1.843	0.0349	3	4.10	3.155	0.0341	3	0.48	0.529
359	0.0690	6	0.66	0.623	0.0698	6	0.22	0.185	0.0364	3	2.15	3.725	0.0469	4	1.35	2.014
360	0.3754	32	0.04	0.183	0.2561	25	0.04	0.158	0.2325	19	0.31	0.918	0.2396	20	0.13	0.352
374	0.0353	3	0.00	0.000	0.0353	3	0.05	0.080	0.0244	2	0.00	0.000	0.0240	2	0.00	0.000
375	0.0116	1	0.00	-	0.0345	3	0.00	0.000	0.0236	2	0.00	0.000	0.0244	2	0.00	0.000
376	0.1583	14	0.00	0.000	0.0930	10	0.00	0.000	0.1219	10	0.00	0.000	0.1200	10	0.00	0.000
377	0.0116	1	0.00	-	0.0229	2	0.03	0.039	0.0240	2	0.48	0.683	0.0229	2	0.16	0.221
378	0.0210	2	0.78	0.985	0.0120	2	0.66	0.873	0.0229	2	1.03	0.330	0.0233	2	1.09	1.214
379	0.0206	2	2.23	1.031	0.0356	3	1.88	0.826	0.0236	2	0.96	0.013	0.0225	2	1.23	0.880
380	0.0210	2	2.64	1.210	0.0113	2	2.48	2.022	0.0236	2	3.94	1.326	0.0236	2	2.42	1.447
381	0.0221	2	0.21	0.009	0.0229	2	0.70	0.144	0.0229	2	2.82	0.985	0.0236	2	1.36	0.352
382	0.0461	4	0.00	0.000	0.0229	3	0.04	0.064	0.0484	4	0.00	0.001	0.0499	4	0.12	0.147
721	0.0221	2	2.98	1.053	0.0203	2	11.82	9.833	0.0244	2	0.62	0.249	0.0236	2	0.48	0.681
722	0.0214	2	1.53	2.163	0.0101	2	24.84	1.628	0.0229	2	13.36	7.909	0.0218	2	19.49	9.977
723	0.0210	2	5.16	2.543	0.0233	2	5.32	1.956	0.0229	2	11.07	10.916	0.0248	2	2.85	1.094
724	0.0225	2	1.92	0.624	0.0206	2	8.40	1.044	0.0225	2	4.55	1.181	0.0233	2	5.83	2.179
725	0.0206	2	7.85	4.225	0.0086	1	2.07	-	0.0229	2	4.97	5.763	0.0210	2	10.03	8.796
726	n.s.	n.s.	n.s.	n.s.	0.0094	2	27.96	33.187	0.0225	2	29.04	26.314	0.0221	2	12.95	3.348
727	0.0094	1	5.16	-	0.0233	2	7.80	6.754	0.0236	2	10.48	8.316	0.0210	2	2.65	1.181
728	0.0214	2	36.24	23.055	0.0206	2	57.21	56.042	0.0233	2	62.32	12.655	0.0210	2	29.91	0.098
752	0.0218	2	36.90	9.964	0.0229	2	54.22	23.669	0.0233	2	56.93	8.677	0.0206	2	23.33	1.989
753	0.0214	2	32.43	8.270	0.0218	2	33.32	8.507	0.0229	2	64.23	4.417	0.0218	2	49.77	21.700
754	0.0330	3	18.70	4.941	0.0210	2	17.32	4.706	0.0206	2	17.12	11.204	0.0195	2	46.69	14.381
755	n.s.	n.s.	n.s.	n.s.	0.0206	2	19.07	0.177	0.0311	3	15.94	8.279	0.0431	4	35.73	20.076
756	0.0109	1	68.36	-	0.0225	2	220.13	34.559	0.0225	2	125.28	46.721	0.0203	2	60.60	40.187
757	0.0304	3	34.70	10.823	0.0206	2	95.25	21.628	0.0233	2	106.53	27.496	0.0214	2	37.41	10.108
758	0.0214	2	39.36	23.502	0.0105	2	52.55	9.813	0.0214	2	52.72	11.736	0.0210	2	56.67	11.487
759	n.s.	n.s.	n.s.	n.s.	0.0214	2	48.19	35.497	0.0218	2	44.72	44.096	0.0210	2	29.43	8.579
760	0.0105	1	10.44	-	0.0214	2	32.89	28.743	0.0225	2	44.98	46.019	0.0210	2	30.56	2.862
761	0.0315	3	61.90	36.985	0.0206	2	46.01	16.364	0.0210	2	37.88	1.004	0.0221	2	36.09	26.813
762	0.0308	3	45.89	27.172	0.0094	2	38.22	15.038	0.0210	2	63.34	37.289	0.0203	2	36.37	1.726
763	n.s.	n.s.	n.s.	n.s.	0.0218	2	35.02	27.312	0.0311	3	21.44	8.946	0.0416	4	25.64	21.799
764	0.0206	2	20.63	2.422	0.0218	2	21.31	10.686	0.0225	2	28.81	12.412	0.0218	2	16.96	6.498
765	0.0206	2	35.43	14.289	0.0098	2	22.82	3.131	0.0221	2	31.43	0.328	0.0203	2	37.13	30.587
766	0.0308	3	62.87	9.784	0.0191	2	20.82	3.479	0.0218	2	31.31	20.000	0.0214	2	16.76	2.475
767	n.s.	n.s.	n.s.	n.s.	0.0109	2	10.21	50.629	0.0214	2	25.90	9.786	0.0210	2	21.21	6.393

$$(**)\ SD = \frac{\sum (x_i - \bar{x})}{n-1}$$

TABLE 2 (cont.).- Swept area, number of hauls and Greenland halibut mean catch (kg) and SD (**) by stratum. Spanish Spring Surveys on NAFO Div. 3NO: 1997-2004. Swept area in square miles. n.s. means stratum not surveyed. 1997-2000 data are transformed C/V *Playa de Menduíña* data, and 2002-2004 data are original from R/V *Vizconde de Eza*. In 2001, there are data from the two vessels.

	2001				2002				2003				2004			
Stratum	Swept area	Tow number	G. halibut Mean catch	G. halibut SD	Swept area	Tow number	G. halibut Mean catch	G. halibut SD	Swept area	Tow number	G. halibut Mean catch	G. halibut SD	Swept area	Tow number	G. halibut Mean catch	G. halibut SD
353	0.0341	3	0.03	0.038	0.0476	4	0.21	0.278	0.0334	3	0.01	0.013	0.033750	3	1.44	2.395
354	0.0338	3	3.22	1.927	0.0356	3	0.85	0.839	0.0338	3	0.04	0.029	0.034500	3	1.51	2.160
355	0.0240	2	17.25	15.486	0.0236	2	0.43	0.467	0.0229	2	2.46	2.492	0.022875	2	4.02	5.119
356	0.0240	2	0.07	0.042	0.0233	2	1.40	1.131	0.0225	2	2.95	3.695	0.022125	2	3.35	3.873
357	0.0244	2	2.69	2.135	0.0240	2	1.15	1.626	0.0229	2	6.72	5.070	0.022875	2	1.50	0.521
358	0.0345	3	8.46	12.298	0.0345	3	3.20	0.819	0.0338	3	3.45	5.973	0.033000	3	0.94	0.438
359	0.0803	7	1.97	2.329	0.0686	6	0.28	0.219	0.0791	7	0.30	0.438	0.079125	7	1.18	2.137
360	0.2423	20	0.17	0.484	0.2865	25	0.00	0.007	0.2254	20	0.02	0.056	0.231000	20	0.11	0.459
374	0.0240	2	0.00	0.000	0.0345	3	0.00	0.000	0.0225	2	0.00	0.000	0.023250	2	0.00	0.005
375	0.0338	3	0.00	0.000	0.0353	3	0.00	0.000	0.0330	3	0.00	0.002	0.033750	3	0.00	0.000
376	0.1155	10	0.00	0.000	0.1140	10	0.00	0.000	0.1125	10	0.00	0.003	0.116625	10	0.00	0.000
377	0.0229	2	0.42	0.537	0.0229	2	0.00	0.001	0.0225	2	1.55	1.884	0.021750	2	0.07	0.011
378	0.0236	2	5.69	8.040	0.0233	2	1.85	0.636	0.0225	2	2.97	3.008	0.022500	2	0.38	0.530
379	0.0229	2	4.61	4.236	0.0229	2	5.85	4.313	0.0229	2	7.67	5.275	0.012375	1	2.60	-
380	0.0206	2	4.06	0.066	0.0225	2	5.05	3.041	0.0229	2	4.345	0.205	0.022125	2	10.3	0.424
381	0.0236	2	0.90	1.271	0.0229	2	0.5275	0.145	0.0229	2	1.06	1.188	0.022500	2	5.488	6.701
382	0.0469	4	0.05	0.080	0.0341	3	0.401	0.683	0.0454	4	0.045	0.061	0.046125	4	0.0575	0.068
721	0.0248	2	0.40	0.431	0.0233	2	0.08	0.062	0.0225	2	0.12	0.051	0.022125	2	1.92	0.693
722	0.0233	2	1.09	0.863	0.0236	2	2.63	2.906	0.0221	2	1.66	0.410	0.021750	2	24.04	23.144
723	0.0240	2	1.33	0.240	0.0233	2	1.24	1.075	0.0229	2	4.02	5.416	0.022875	2	3.85	3.755
724	0.0353	3	3.45	2.786	0.0225	2	4.75	1.202	0.0225	2	7.07	4.971	0.021375	2	12.45	3.182
725	0.0116	2	2.67	0.522	0.0225	2	7.35	6.718	0.0229	2	10.55	0.778	0.022500	2	19.57	19.537
726	0.0116	2	3.65	1.200	0.0214	2	3.25	3.323	0.0225	2	0.00	0.000	0.022500	2	14.71	1.287
727	0.0225	2	3.79	0.243	0.0233	2	2.01	1.400	0.0218	2	18.48	11.066	0.023250	2	20.47	10.281
728	0.0229	2	8.62	1.654	0.0229	2	7.93	10.986	0.0225	2	39.95	17.748	0.018000	2	5.70	4.950
752	0.0210	2	26.37	8.723	0.0116	1	0.34	-	0.0229	2	39.80	39.032	0.021375	2	4.64	5.424
753	0.0214	2	22.66	4.883	0.0229	2	2.45	3.465	0.0229	2	16.64	12.721	0.021750	2	4.37	0.820
754	0.0195	2	41.09	41.477	0.0341	3	20.33	4.996	0.0218	2	19.12	6.484	0.021375	2	3.21	0.007
755	0.0416	4	27.16	16.279	0.0338	3	0.46	0.655	0.0221	2	1.88	2.652	0.031875	3	2.64	4.567
756	0.0113	2	30.10	16.124	0.0229	2	10.55	14.920	0.0221	2	23.11	27.994	0.021750	2	14.99	4.609
757	0.0233	2	42.23	4.326	0.0225	2	9.95	2.192	0.0221	2	2.49	2.348	0.021750	2	4.55	6.435
758	0.0218	2	42.11	8.828	0.0225	2	17.15	1.485	0.0221	2	0.00	0.000	0.021375	2	9.73	3.714
759	0.0221	2	76.11	21.890	0.0225	2	2.15	3.041	0.0113	1	21.61	-	0.021375	2	4.43	3.203
760	0.0229	2	9.42	10.861	0.0229	2	4.75	4.172	0.0218	2	19.38	13.188	0.022125	2	14.63	7.958
761	0.0225	2	8.10	7.778	0.0225	2	16.65	16.900	0.0225	2	13.26	3.387	0.022125	2	2.92	1.996
762	0.0116	2	22.50	21.072	0.0225	2	2.11	1.563	0.0225	2	34.91	19.622	0.023250	2	8.44	4.349
763	0.0330	3	31.61	22.554	0.0225	2	0.74	1.047	0.0311	3	1.75	3.037	0.032625	3	20.78	9.792
764	0.0240	2	53.64	1.888	0.0236	2	6.95	5.869	0.0221	2	28.37	15.882	0.022875	2	33.78	29.165
765	0.0113	2	35.87	13.111	0.0236	2	45.90	39.739	0.0113	1	31.80	-	0.022500	2	20.98	8.464
766	0.0203	2	16.42	9.557	0.0233	2	9.53	1.025	0.0225	2	8.91	1.966	0.022500	2	8.46	11.958
767	0.0218	2	5.72	2.593	0.0225	2	0.85	1.202	0.0229	2	15.96	21.270	0.021750	2	1.26	1.782

$$(**)\ SD = \frac{\sum (x_i - \bar{x})}{n-1}$$

TABLE 3.- Stratified mean catches (Kg) by stratum and year and SD by year of Greenland halibut (1997-2004). n.s. means stratum not surveyed. 1997-2000 data are transformed C/V *Playa de Menduíña* data (by FPC). 2002-2004 data are original from R/V *Vizconde de Eza*. In 2001, there are data from the two vessels.

Stratum	1997	1998	1999	2000	2001	2002	2003	2004
353	15.61	368.31	164.80	50.27	7.17	57.16	2.06	387.99
354	171.84	581.54	211.23	27.55	792.94	209.92	10.33	371.38
355	301.21	21.29	16.18	16.14	1276.50	31.86	181.89	297.48
356	193.06	200.47	10.97	23.25	3.29	65.80	138.51	157.52
357	176.36	1377.73	277.07	17.81	441.16	188.60	1101.26	246.25
358	310.53	529.11	921.77	108.61	1903.50	720.00	776.85	212.40
359	279.62	94.44	905.35	568.81	827.57	116.83	125.94	495.40
360	120.66	100.23	852.78	358.57	461.98	5.79	49.54	314.48
374	0.00	9.93	0.00	0.00	0.00	0.00	0.00	0.75
375	0.00	0.00	0.00	0.00	0.00	0.00	0.36	0.00
376	0.00	0.00	0.00	0.00	0.00	0.00	1.73	0.00
377	0.00	2.78	48.27	15.59	42.00	0.10	154.80	7.40
378	108.38	92.26	143.03	151.61	790.22	257.15	413.25	52.13
379	236.64	199.42	101.35	130.87	488.13	620.10	813.02	275.60
380	253.84	237.93	377.84	232.32	389.43	484.80	417.12	988.80
381	30.54	100.25	406.36	196.29	129.93	75.96	152.64	790.27
382	0.00	12.74	0.16	42.51	16.16	137.54	15.44	19.72
721	193.53	768.09	40.40	31.32	25.68	5.23	7.54	124.80
722	128.46	2086.59	1122.44	1637.46	91.56	220.50	139.44	2018.94
723	799.62	824.44	1715.78	441.21	206.15	192.20	623.18	596.29
724	237.69	1041.12	564.01	722.86	427.80	589.00	876.06	1543.80
725	824.43	217.35	521.45	1052.65	280.46	771.75	1107.75	2054.33
726	n.s.	2013.07	2090.94	932.35	262.92	234.00	0.00	1059.12
727	495.47	749.00	1006.54	253.97	364.03	192.96	1773.60	1965.12
728	2826.86	4462.31	4861.26	2333.24	672.64	618.66	3116.10	444.60
752	4833.71	7102.82	7457.90	3056.49	3454.13	44.41	5213.80	607.19
753	4475.84	4597.53	8863.93	6868.76	3126.94	338.10	2295.63	603.06
754	3365.21	3117.02	3081.94	8403.69	7396.15	3660.00	3440.70	576.90
755	n.s.	7342.42	6136.26	13757.44	10457.90	177.23	721.88	1015.12
756	6904.11	22233.50	12653.16	6121.02	3040.24	1065.55	2333.61	1514.09
757	3539.38	9715.91	10866.31	3815.73	4307.61	1014.90	253.98	464.10
758	3896.21	5202.82	5218.91	5610.39	4168.97	1697.85	0.00	962.87
759	n.s.	6119.66	5679.93	3737.70	9666.37	273.05	2744.47	561.98
760	1608.22	5065.54	6926.79	4706.01	1450.68	731.50	2983.75	2252.64
761	10584.19	7867.63	6477.12	6170.76	1385.10	2847.15	2266.61	499.58
762	9728.04	8102.93	13428.13	7711.31	4769.98	446.26	7399.86	1788.22
763	n.s.	9139.92	5595.80	6691.10	8250.35	193.14	457.62	5422.71
764	2063.07	2131.30	2880.87	1695.94	5363.50	695.00	2837.00	3377.75
765	4392.98	2829.86	3897.46	4604.20	4447.98	5691.60	3943.20	2600.90
766	9053.27	2998.23	4508.03	2413.42	2364.63	1371.60	1283.04	1217.59
767	n.s.	1613.33	4092.64	3351.32	904.20	134.30	2521.68	199.08
TOTAL	72148.61	121270.85	124125.15	98060.56	84455.93	26177.55	51917.35	38088.31
$(\bar{Y})$	7.73	11.73	12.00	9.48	8.17	2.64	5.10	3.68
S.D.	0.62	0.89	1.00	0.75	0.84	0.45	0.61	0.40

TABLE 4.- Survey estimates (by the swept area method) of Greenland halibut biomass (t) and SD by stratum and year on NAFO Div. 3NO. n.s. means stratum not surveyed. 1997-2000 data are transformed C/V *Playa de Menduíña* data. 2001-2004 data are original from R/V *Vizconde de Eza.* In 2001, there are data from the two vessels. The last two rows present the biomass corresponding to set of ages 5+ and 10+.

Stratum	1997	1998	1999	2000	2001	2002	2003	2004
353	1	32	14	4	1	5	0	34
354	15	49	19	2	70	18	1	32
355	26	2	1	1	106	3	16	26
356	17	18	1	2	0	6	12	14
357	16	115	23	1	36	16	96	22
358	28	46	79	10	165	63	69	19
359	24	8	75	49	72	10	11	44
360	10	9	70	30	38	1	4	27
374	0	1	0	0	0	0	0	0
375	0	0	0	0	0	0	0	0
376	0	0	0	0	0	0	0	0
377	0	0	4	1	4	0	14	1
378	10	8	13	13	67	22	37	5
379	23	17	9	12	43	54	71	22
380	24	21	32	20	38	43	36	89
381	3	9	36	17	11	7	13	70
382	0	1	0	3	1	12	1	2
721	17	76	3	3	2	0	1	11
722	12	195	98	151	8	19	13	186
723	76	71	150	36	17	17	54	52
724	21	101	50	62	36	52	78	144
725	80	25	46	100	24	69	97	183
726	n.s.	195	186	84	22	22	0	94
727	53	64	85	24	32	17	163	169
728	265	433	418	222	59	54	277	49
752	444	621	642	296	329	151	456	57
753	419	423	775	632	293	30	201	55
754	306	297	299	862	758	275	316	54
755	n.s.	712	591	1276	1005	14	65	96
756	635	1976	1125	605	266	93	211	139
757	350	942	935	357	371	90	23	43
758	365	478	488	534	383	151	0	90
759	n.s.	573	522	356	874	24	244	53
760	153	474	616	448	127	64	274	204
761	1008	763	617	558	123	253	201	45
762	949	786	1279	762	424	40	658	154
763	n.s.	840	539	643	750	17	44	499
764	200	196	256	156	447	59	256	295
765	426	270	352	455	402	482	351	231
766	883	314	415	226	233	118	114	108
767	n.s.	146	383	319	83	12	220	18
TOTAL	6859	11305	11246	9331	7721	2380	4701	3437
S.D.	546	860	973	707	790	410	575	373
Biomass 5+	5647	7784	8419	9105	7124	1964	3020	2176
Biomass	3033	3522	4750	5556	3799	270	379	284

TABLE 5.- Length weight relationships in the calculation of Greenland halibut biomass. The equation is $Weight = a(l+0.5)^b$ Spanish Spring Surveys on NAFO Div. 3NO: 1997-2004. To calculate the parameters for the indeterminate individuals, we used the total data (males + females + indeterminate individuals)

		1997	1998	1999	2000	2001	2002	2003	2004
Males	a	0,0042 Error = 0.0663	0,0042 Error = 0.0824	0,0044 Error = 0.1112	0,0020 Error = 0.1562	0,0036 Error = 0.2538	0,0031 Error = 0.0962	0,0033 Error = 0.1081	0.0034 Error = 0.0886
	b	3,1561 Error = 0.0185	3,1622 Error = 0.0226	3,1587 Error = 0.0308	3,3625 Error = 0.0433	3,1925 Error = 0.0846	3,2496 Error = 0.0285	3,2318 Error = 0.0318	3.2123 Error = 0.0254
		R^2 = 0.999 N = 893	R^2 = 0.999 N = 417	R^2 = 0.995 N = 267	R^2 = 0.996 N = 315	R^2 = 0.997 N = 15	R^2 = 0.987 N = 316	R^2 = 0.995 N = 509	R2 = 0.997 N = 498
Females	a	0,0033 Error = 0.0650	0,0038 Error = 0.0692	0,0033 Error = 0.0897	0,0018 Error = 0.1003	0,0034 Error = 0.2252	0,0027 Error = 0.1315	0,0034 Error = 0.0871	0.0026 Error = 0.0767
	b	3,2308 Error = 0.0170	3,2043 Error = 0.0179	3,2547 Error = 0.0237	3,4066 Error = 0.0262	3,2240 Error = 0.0656	3,2950 Error = 0.0368	3,2302 Error = 0.0241	3.2998 Error = 0.0212
		R^2 = 0.999 N = 1473	R^2 = 0.999 N = 681	R^2 = 0.996 N = 408	R^2 = 0.995 N = 642	R^2 = 0.995 N = 26	R^2 = 0.993 N = 456	R^2 = 0.997 N = 726	R2 = 0.998 N = 600
Indet.	a	0,0032 Error = 0.0547	0,0036 Error = 0.0706	0,0040 Error = 0.1010	0,0019 Error = 0.0893	0,0038 Error = 0.1320	0,0028 Error = 0.0941	0,0027 Error = 0.08139	0.0027 Error = 0.0781
	b	3,2409 Error = 0.0145	3,2201 Error = 0.0183	3,2009 Error = 0.0269	3,3882 Error = 0.0234	3,1925 Error = 0.0394	3,2837 Error = 0.0263	3,2894 Error = 0.0226	3.2812 Error = 0.0217
		R^2 = 0.999 N = 2383	R^2 = 0.999 N = 1105	R^2 = 0.987 N = 679	R^2 = 0.998 N = 966	R^2 = 0.997 N = 44	R^2 = 0.996 N = 776	R^2 = 0.997 N = 1243	R2 = 0.997 N = 1105

TABLE 6.- Greenland halibut length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Spring Survey on NAFO 3NO: 1997-2004. Indet. means indeterminate. 1997-2000 data are transformed C/V *Playa de Menduíña* data. 2002-2004 data are original R/V *Vizconde de Eza* data. In 2001, there are data form the two vessels. (*) indicates untransformed data.

Length (cm.)	1997				1998				1999				2000			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.007	0.000	0.000	0.000	0.000
10	0.000	0.000	0.037	0.037	0.000	0.000	0.000	0.000	0.000	0.013	0.000	0.013	0.000	0.000	0.000	0.000
12	0.080	0.109	0.153	0.343	0.000	0.000	0.015	0.015	0.054	0.187	0.020	0.261	0.088	0.094	0.025	0.206
14	0.137	0.504	0.320	0.961	0.000	0.157	0.045	0.201	0.103	0.506	0.007	0.616	0.163	0.312	0.031	0.506
16	0.069	0.110	0.011	0.190	0.039	0.081	0.045	0.166	0.095	0.138	0.000	0.234	0.088	0.119	0.000	0.206
18	0.439	0.648	0.000	1.086	0.038	0.060	0.000	0.098	0.106	0.197	0.007	0.310	0.081	0.088	0.000	0.169
20	0.600	0.696	0.006	1.302	0.120	0.145	0.000	0.265	0.123	0.198	0.000	0.321	0.020	0.022	0.000	0.042
22	0.860	1.027	0.000	1.887	0.469	0.574	0.009	1.053	0.572	0.843	0.000	1.415	0.016	0.027	0.000	0.043
24	0.451	0.493	0.000	0.943	0.678	0.995	0.000	1.673	0.347	0.713	0.000	1.059	0.074	0.084	0.000	0.158
26	0.508	0.651	0.000	1.159	1.153	1.143	0.000	2.296	0.302	0.488	0.000	0.790	0.084	0.124	0.001	0.210
28	0.627	0.739	0.000	1.366	1.472	1.989	0.000	3.461	0.731	0.561	0.000	1.292	0.040	0.058	0.000	0.097
30	0.359	0.427	0.000	0.787	1.218	1.655	0.000	2.873	0.718	0.678	0.000	1.397	0.029	0.041	0.000	0.070
32	0.194	0.332	0.000	0.526	1.018	1.236	0.000	2.253	1.022	1.115	0.000	2.138	0.067	0.073	0.000	0.140
34	0.172	0.239	0.000	0.412	0.959	1.111	0.000	2.070	1.358	1.503	0.000	2.861	0.117	0.149	0.000	0.265
36	0.156	0.302	0.000	0.457	0.899	1.122	0.000	2.021	1.074	1.400	0.000	2.474	0.201	0.242	0.000	0.443
38	0.154	0.321	0.000	0.475	0.748	1.120	0.000	1.867	0.730	1.164	0.000	1.894	0.305	0.390	0.000	0.695
40	0.150	0.304	0.000	0.454	0.502	0.794	0.000	1.296	0.446	0.798	0.000	1.243	0.291	0.546	0.000	0.837
42	0.160	0.276	0.000	0.436	0.298	0.525	0.000	0.822	0.267	0.597	0.000	0.864	0.289	0.565	0.000	0.854
44	0.139	0.260	0.000	0.399	0.201	0.457	0.000	0.658	0.178	0.366	0.000	0.543	0.210	0.545	0.000	0.756
46	0.127	0.234	0.000	0.361	0.151	0.318	0.000	0.469	0.112	0.262	0.000	0.374	0.135	0.356	0.000	0.490
48	0.091	0.240	0.000	0.331	0.128	0.264	0.000	0.392	0.080	0.177	0.000	0.257	0.074	0.247	0.000	0.321
50	0.080	0.176	0.000	0.255	0.096	0.210	0.000	0.306	0.046	0.154	0.000	0.201	0.057	0.169	0.000	0.226
52	0.059	0.148	0.000	0.207	0.072	0.139	0.000	0.211	0.038	0.093	0.000	0.131	0.051	0.119	0.000	0.170
54	0.046	0.095	0.000	0.141	0.046	0.089	0.000	0.135	0.027	0.083	0.000	0.110	0.029	0.092	0.000	0.120
56	0.031	0.080	0.000	0.111	0.039	0.088	0.000	0.127	0.021	0.061	0.000	0.082	0.030	0.090	0.000	0.120
58	0.030	0.064	0.000	0.094	0.016	0.079	0.000	0.095	0.018	0.047	0.000	0.065	0.015	0.059	0.000	0.075
60	0.021	0.059	0.000	0.081	0.020	0.061	0.000	0.082	0.014	0.041	0.000	0.055	0.009	0.047	0.000	0.055
62	0.016	0.050	0.000	0.065	0.010	0.023	0.000	0.033	0.006	0.026	0.000	0.032	0.012	0.051	0.000	0.064
64	0.001	0.145	0.000	0.146	0.036	0.112	0.000	0.149	0.015	0.135	0.000	0.150	0.012	0.107	0.000	0.119
66	0.022	0.232	0.000	0.254	0.056	0.136	0.000	0.191	0.012	0.181	0.000	0.193	0.014	0.167	0.000	0.180
68	0.012	0.191	0.000	0.203	0.000	0.100	0.000	0.100	0.015	0.114	0.000	0.130	0.027	0.188	0.000	0.214
70	0.004	0.085	0.000	0.089	0.004	0.116	0.000	0.120	0.005	0.144	0.000	0.149	0.000	0.130	0.000	0.130
72	0.000	0.120	0.000	0.120	0.000	0.070	0.000	0.070	0.000	0.078	0.000	0.078	0.000	0.117	0.000	0.117
74	0.000	0.075	0.000	0.075	0.000	0.083	0.000	0.083	0.000	0.136	0.000	0.136	0.000	0.102	0.000	0.102
76	0.000	0.059	0.000	0.059	0.000	0.043	0.000	0.043	0.000	0.068	0.000	0.068	0.000	0.091	0.000	0.091
78	0.000	0.014	0.000	0.014	0.000	0.087	0.000	0.087	0.000	0.114	0.000	0.114	0.000	0.071	0.000	0.071
80	0.000	0.079	0.000	0.079	0.000	0.059	0.000	0.059	0.000	0.121	0.000	0.121	0.000	0.125	0.000	0.125
82	0.000	0.027	0.000	0.027	0.000	0.047	0.000	0.047	0.000	0.009	0.000	0.009	0.000	0.065	0.000	0.065
84	0.000	0.005	0.000	0.005	0.000	0.022	0.000	0.022	0.000	0.027	0.000	0.027	0.000	0.046	0.000	0.046
86	0.000	0.000	0.000	0.000	0.000	0.023	0.000	0.023	0.000	0.023	0.000	0.023	0.000	0.045	0.000	0.045
88	0.000	0.005	0.000	0.005	0.000	0.013	0.000	0.013	0.000	0.031	0.000	0.031	0.000	0.009	0.000	0.009
90	0.000	0.014	0.000	0.014	0.000	0.007	0.000	0.007	0.000	0.002	0.000	0.002	0.000	0.008	0.000	0.008
92	0.000	0.032	0.000	0.032	0.000	0.004	0.000	0.004	0.000	0.000	0.000	0.000	0.000	0.009	0.000	0.009
94	0.000	0.000	0.000	0.000	0.000	0.011	0.000	0.011	0.000	0.003	0.000	0.003	0.000	0.005	0.000	0.005
96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.022	0.000	0.022	0.000	0.000	0.000	0.000
98	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.003	0.000	0.003	0.000	0.000	0.000	0.000
Total	5.797	9.670	0.526	15.993	10.487	15.366	0.114	25.967	8.635	13.622	0.040	22.297	2.627	5.992	0.058	8.677

TABLE 6 (cont.).- Greenland halibut length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Spring Survey on NAFO 3NO: 1997-2004. Indet. means indeterminate. 1997-2000 data are transformed C/V *Playa de Menduíña* data. 2002-2004 data are original R/V *Vizconde de Eza* data. In 2001, there are data from the two vessels. (*) indicates untransformed data.

Length (cm.)	2001				2002				2003				2004			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
8	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.000	0.007	0.000	0.000	0.000	0.000
10	0.015	0.025	0.042	0.082	0.025	0.075	0.044	0.145	0.169	0.134	0.099	0.402	0.024	0.024	0.024	0.073
12	0.276	0.458	0.189	0.923	0.435	0.422	0.038	0.894	0.529	0.832	0.021	1.382	0.417	0.327	0.012	0.756
14	0.789	1.267	0.249	2.304	0.718	0.743	0.025	1.486	0.811	1.136	0.000	1.947	1.469	1.444	0.042	2.955
16	0.507	0.713	0.026	1.247	0.183	0.227	0.000	0.410	0.197	0.353	0.000	0.550	1.655	1.819	0.000	3.474
18	0.047	0.053	0.000	0.099	0.006	0.013	0.000	0.019	0.014	0.014	0.000	0.028	0.568	0.405	0.000	0.973
20	0.206	0.261	0.000	0.467	0.031	0.038	0.000	0.069	0.092	0.049	0.000	0.141	0.042	0.036	0.000	0.079
22	0.802	0.689	0.000	1.491	0.195	0.163	0.000	0.358	0.324	0.339	0.000	0.663	0.133	0.187	0.000	0.320
24	0.630	0.817	0.000	1.447	0.309	0.390	0.000	0.699	0.600	0.889	0.000	1.489	0.314	0.296	0.000	0.610
26	0.158	0.244	0.000	0.403	0.208	0.315	0.000	0.523	0.304	0.523	0.000	0.827	0.356	0.495	0.000	0.852
28	0.041	0.040	0.000	0.081	0.063	0.082	0.000	0.145	0.219	0.205	0.000	0.424	0.169	0.236	0.000	0.405
30	0.011	0.030	0.000	0.041	0.082	0.088	0.000	0.170	0.290	0.212	0.000	0.502	0.272	0.248	0.000	0.519
32	0.065	0.059	0.000	0.124	0.151	0.221	0.000	0.372	0.480	0.565	0.000	1.044	0.362	0.507	0.000	0.870
34	0.060	0.087	0.000	0.147	0.082	0.245	0.000	0.327	0.381	0.508	0.000	0.890	0.368	0.550	0.000	0.918
36	0.098	0.137	0.000	0.236	0.176	0.208	0.000	0.384	0.367	0.501	0.000	0.868	0.254	0.532	0.000	0.785
38	0.176	0.212	0.000	0.387	0.145	0.157	0.000	0.302	0.212	0.473	0.000	0.684	0.260	0.429	0.000	0.689
40	0.176	0.297	0.000	0.474	0.095	0.296	0.000	0.390	0.275	0.550	0.000	0.825	0.157	0.368	0.000	0.525
42	0.254	0.379	0.000	0.633	0.114	0.220	0.000	0.334	0.247	0.402	0.000	0.649	0.097	0.266	0.000	0.362
44	0.216	0.485	0.000	0.701	0.101	0.290	0.000	0.391	0.141	0.331	0.000	0.473	0.109	0.236	0.000	0.344
46	0.212	0.473	0.000	0.685	0.101	0.120	0.000	0.221	0.141	0.261	0.000	0.402	0.109	0.157	0.000	0.266
48	0.157	0.418	0.000	0.574	0.032	0.164	0.000	0.195	0.148	0.176	0.000	0.325	0.072	0.121	0.000	0.193
50	0.080	0.269	0.000	0.349	0.075	0.170	0.000	0.245	0.071	0.197	0.000	0.268	0.079	0.109	0.000	0.187
52	0.049	0.155	0.000	0.204	0.025	0.069	0.000	0.095	0.092	0.148	0.000	0.240	0.072	0.079	0.000	0.151
54	0.029	0.085	0.000	0.114	0.006	0.063	0.000	0.069	0.028	0.134	0.000	0.162	0.036	0.079	0.000	0.115
56	0.014	0.066	0.000	0.080	0.013	0.044	0.000	0.057	0.035	0.099	0.000	0.134	0.018	0.054	0.000	0.072
58	0.015	0.050	0.000	0.065	0.000	0.025	0.000	0.025	0.021	0.085	0.000	0.106	0.012	0.024	0.000	0.036
60	0.015	0.028	0.000	0.043	0.000	0.013	0.000	0.013	0.000	0.042	0.000	0.042	0.024	0.036	0.000	0.060
62	0.009	0.024	0.000	0.033	0.000	0.006	0.000	0.006	0.000	0.028	0.000	0.028	0.006	0.012	0.000	0.018
64	0.011	0.127	0.000	0.138	0.000	0.013	0.000	0.013	0.000	0.035	0.000	0.035	0.006	0.006	0.000	0.012
66	0.029	0.088	0.000	0.117	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.007	0.000	0.006	0.000	0.006
68	0.007	0.086	0.000	0.094	0.000	0.013	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
70	0.000	0.088	0.000	0.088	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
72	0.000	0.078	0.000	0.078	0.000	0.000	0.000	0.000	0.000	0.021	0.000	0.021	0.000	0.012	0.000	0.012
74	0.000	0.090	0.000	0.090	0.000	0.000	0.000	0.000	0.000	0.014	0.000	0.014	0.000	0.006	0.000	0.006
76	0.000	0.084	0.000	0.084	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.007	0.000	0.012	0.000	0.012
78	0.004	0.082	0.000	0.086	0.000	0.006	0.000	0.006	0.000	0.007	0.000	0.007	0.000	0.000	0.000	0.000
80	0.000	0.059	0.000	0.059	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.006	0.000	0.006
82	0.000	0.053	0.000	0.053	0.000	0.006	0.000	0.006	0.000	0.007	0.000	0.007	0.000	0.000	0.000	0.000
84	0.000	0.039	0.000	0.039	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
86	0.000	0.035	0.000	0.035	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
88	0.000	0.016	0.000	0.016	0.000	0.013	0.000	0.013	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
90	0.000	0.009	0.000	0.009	0.000	0.006	0.000	0.006	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
92	0.000	0.008	0.000	0.008	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
94	0.000	0.005	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
96	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.007	0.000	0.007	0.000	0.006	0.000	0.006
98	0.000	0.007	0.000	0.007	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
100	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
102	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
104	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	5.159	8.775	0.507	14.441	3.369	4.924	0.107	8.400	6.196	9.293	0.120	15.609	7.462	9.128	0.079	16.669

TABLE 7.-Greenland halibut age numbers per haul mean catches by sex and year. Number per stratified mean catches. Spanish Spring Survey on NAFO 3NO: 1997-2004. Indet. means indeterminate. 1997-2000 data are transformed C/V *Playa de Menduíña* data. 2002-2004 data are original R/V *Vizconde de Eza* data. In 2001, there are data form the two vessels. (*) indicates untransformed data.

	1997				1998				1999				2000			
Age	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
0											0.007	0.007				
1	1.956	2.477	0.525	4.958	0.396	0.644	0.109	1.149	0.446	1.214	0.029	1.689	0.387	0.511	0.056	0.955
2	1.687	1.690	0.001	3.379	2.321	2.230	0.005	4.556	1.103	1.837	0.005	2.945	0.097	0.148	0.000	0.245
3	0.726	1.110		1.835	3.045	3.887		6.932	2.417	1.950		4.367	0.173	0.243	0.001	0.417
4	0.299	1.134		1.432	2.284	3.252		5.536	2.591	2.811		5.402	0.225	0.320	0.000	0.545
5	0.404	0.524		0.928	1.241	2.044		3.285	1.193	2.465		3.657	0.580	0.927		1.507
6	0.387	0.627		1.013	0.646	1.209		1.855	0.481	1.282		1.763	0.600	1.220		1.820
7	0.151	0.632		0.783	0.244	0.558		0.802	0.198	0.312		0.510	0.382	0.769		1.151
8	0.133	0.368		0.501	0.157	0.400		0.556	0.097	0.288		0.385	0.072	0.331		0.403
9	0.026	0.109		0.135	0.054	0.175		0.230	0.041	0.173		0.214	0.038	0.154		0.192
10	0.003	0.289		0.292	0.056	0.132		0.188	0.032	0.067		0.098	0.018	0.063		0.081
11	0.006	0.233		0.238	0.029	0.118		0.146	0.022	0.113		0.135	0.010	0.090		0.100
12	0.019	0.133		0.152	0.014	0.219		0.233	0.014	0.303		0.317	0.012	0.150		0.162
13		0.070		0.070		0.188		0.188		0.306		0.306	0.007	0.280		0.287
14		0.152		0.152		0.146		0.146		0.268		0.268	0.027	0.341		0.368
15		0.064		0.064		0.106		0.106		0.156		0.156		0.230		0.230
16		0.015		0.015		0.026		0.026		0.059		0.059		0.123		0.123
17		0.015		0.015		0.016		0.016		0.016		0.016		0.047		0.047
18		0.023		0.023		0.017		0.017		0.003		0.003		0.026		0.026
19														0.016		0.016
20		0.006		0.006												
Total	5.797	9.670	0.526	15.993	10.487	15.366	0.114	25.967	8.635	13.622	0.040	22.297	2.627	5.992	0.058	8.677

	2001				2002				2003				2004			
Age	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
0																
1	1.514	2.321	0.502	4.337	1.349	1.383	0.107	2.839	1.580	2.385	0.119	4.084	0.441	0.735	0.043	1.220
2	1.617	1.894	0.005	3.516	0.377	0.358	0.001	0.736	1.484	1.893	0.001	3.378	4.018	3.776	0.035	7.829
3	0.320	0.406		0.725	0.467	0.796		1.262	1.106	1.145		2.252	0.898	1.498		2.397
4	0.198	0.301		0.500	0.265	0.499		0.765	1.095	1.267		2.362	1.160	1.167		2.326
5	0.551	0.765		1.316	0.484	0.674		1.158	0.399	1.262		1.660	0.344	0.966		1.310
6	0.601	1.354		1.955	0.307	0.598		0.906	0.266	0.563		0.829	0.374	0.443		0.817
7	0.266	0.583		0.849	0.106	0.321		0.427	0.230	0.427		0.657	0.120	0.337		0.456
8	0.013	0.133		0.146	0.013	0.204		0.217	0.032	0.186		0.218	0.075	0.107		0.183
9	0.009	0.039		0.048		0.016		0.016	0.004	0.046		0.049	0.012	0.027		0.039
10	0.012	0.023		0.035		0.013		0.013		0.035		0.035	0.012	0.008		0.020
11	0.007	0.087		0.094		0.019		0.019		0.014		0.014	0.006	0.004		0.010
12	0.015	0.248		0.263		0.019		0.019		0.049		0.049		0.018		0.018
13	0.032	0.248		0.280		0.006		0.006		0.007		0.007		0.018		0.018
14	0.004	0.219		0.224		0.006		0.006		0.007		0.007		0.012		0.012
15		0.085		0.085		0.013		0.013						0.012		0.012
16		0.034		0.034												
17		0.027		0.027						0.007		0.007				
18																
19		0.007		0.007												
20																
Total	5.159	8.775	0.507	14.441	3.369	4.924	0.107	8.400	6.196	9.293	0.120	15.609	7.462	9.128	0.079	16.669

TABLE 8.-Greenland halibut mean length (cm) per haul mean catches by sex and year. Number per stratified mean catches. Spanish Spring Survey on NAFO 3NO: 1997-2004. Indet. means indeterminate. 1997-2000 data are transformed C/V *Playa de Menduíña* data. 2002-2004 data are original R/V *Vizconde de Eza* data. In 2001, there are data form the two vessels. (*) indicates untransformed data.

	1997				1998				1999				2000			
Age	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
0											7.50	7.50				
1	19.98	18.45	13.31	18.51	20.99	19.30	14.63	19.44	16.73	16.19	13.32	16.29	14.50	14.16	12.94	14.22
2	25.20	23.66	20.22	24.42	25.84	24.60	21.50	25.23	23.28	23.02	18.50	23.11	21.55	19.17	26.50	20.12
3	29.77	28.52		29.01	30.06	29.02		29.48	31.28	29.70		30.58	26.04	26.67	26.50	26.41
4	35.92	33.81		34.25	33.84	33.46		33.61	33.80	34.09		33.95	33.67	32.12	26.50	32.76
5	40.32	39.56		39.89	37.76	38.46		38.19	37.27	38.31		37.97	38.31	38.63		38.51
6	44.79	44.57		44.65	42.43	42.18		42.26	42.31	41.02		41.37	41.76	42.67		42.37
7	51.44	48.56		49.12	48.73	47.57		47.92	46.81	46.65		46.71	45.21	46.25		45.90
8	51.97	55.25		54.38	51.42	52.05		51.87	52.25	50.88		51.23	54.03	51.22		51.72
9	63.41	62.50		62.68	59.18	55.82		56.62	56.11	53.92		54.34	55.12	55.56		55.47
10	62.50	66.68		66.64	61.69	63.65		63.07	57.65	59.04		58.59	61.39	61.69		61.62
11	66.27	66.56		66.55	65.29	65.46		65.43	65.35	64.85		64.93	65.50	63.95		64.09
12	66.47	71.87		71.19	65.36	70.31		70.01	67.52	68.80		68.74	64.33	65.87		65.76
13		76.09		76.09		73.78		73.78		73.02		73.02	64.21	68.57		68.47
14		77.16		77.16		74.93		74.93		74.97		74.97	67.09	72.95		72.53
15		75.69		75.69		77.75		77.75		76.63		76.63		78.36		78.36
16		86.59		86.59		80.96		80.96		84.26		84.26		79.01		79.01
17		91.50		91.50		88.17		88.17		88.10		88.10		83.20		83.20
18		83.45		83.45		91.07		91.07		94.50		94.50		84.77		84.77
19														90.67		90.67
20		92.50		92.50												
Total	28.59	34.49	13.33	31.66	32.50	35.48	14.94	34.19	32.66	36.29	13.00	34.84	36.17	45.87	13.28	42.72

	2001				2002				2003				2004			
Age	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
0																
1	14.20	14.17	12.91	14.04	13.51	13.42	11.60	13.39	13.10	13.33	10.07	13.15	12.16	12.97	11.29	12.61
2	22.12	22.05	14.79	22.07	23.05	20.94	14.50	22.01	23.16	23.93	12.50	23.59	16.64	16.82	14.14	16.71
3	24.74	26.09		25.50	25.20	25.46		25.36	31.28	31.27		31.27	24.93	28.95		27.44
4	33.26	35.75		34.76	33.60	33.27		33.38	36.45	36.46		36.46	33.56	34.69		34.12
5	39.93	41.14		40.63	37.43	39.09		38.40	42.24	40.99		41.29	39.75	39.31		39.42
6	44.87	45.18		45.09	44.16	43.44		43.69	46.90	46.43		46.58	44.94	44.76		44.84
7	48.65	50.03		49.60	49.91	48.59		48.91	51.60	52.37		52.10	52.15	50.52		50.95
8	56.90	55.72		55.82	55.00	53.35		53.45	56.28	56.54		56.50	54.26	55.77		55.15
9	59.01	59.32		59.26		57.10		57.10	58.50	60.73		60.57	59.50	58.72		58.96
10	60.41	62.10		61.54		61.00		61.00		63.30		63.30	61.50	61.50		61.50
11	62.34	65.50		65.26		63.17		63.17		64.50		64.50	64.50	64.50		64.50
12	64.79	68.33		68.13		72.50		72.50		72.07		72.07		63.83		63.83
13	66.20	72.58		71.84		78.50		78.50		77.50		77.50		73.17		73.17
14	78.50	77.15		77.17		87.50		87.50		82.50		82.50		75.50		75.50
15		82.23		82.23		88.50		88.50						88.50		88.50
16		86.10		86.10												
17		89.40		89.40						95.50		95.50				
18																
19		97.50		97.50												
20																
Total	27.04	34.14	12.92	30.86	25.31	30.08	11.62	27.93	27.89	30.25	10.09	29.16	23.62	26.78	12.58	25.30

TABLE 9.-Greenland halibut mean weight (gr) per haul mean catches by sex and year. Number per stratified mean catches. Spanish Spring Survey on NAFO 3NO: 1997-2004. Indet. means indeterminate. 1997-2000 data are transformed C/V *Playa de Menduíña* data. 2002-2004 data are original R/V *Vizconde de Eza* data. In 2001, there are data from the two vessels. (*) indicates untransformed data.

	1997				1998				1999				2000			
Age	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
0											2.53	2.53				
1	57.23	45.17	14.61	46.69	65.88	56.04	21.59	56.16	36.45	34.35	16.75	34.60	17.19	15.59	11.38	15.99
2	117.17	94.13	54.68	105.62	126.31	111.71	70.48	119.10	95.44	92.77	45.51	93.69	65.78	46.28	126.18	54.05
3	196.25	168.88		179.71	206.00	188.43		196.15	240.41	210.93		227.24	119.45	140.34	126.18	131.63
4	345.51	295.29		305.77	299.40	300.46		300.02	307.65	328.12		318.30	279.79	255.30	126.18	265.35
5	508.91	487.95		497.08	418.84	463.32		446.52	412.07	478.03		456.52	428.89	464.62		450.87
6	708.81	714.53		712.35	604.64	625.40		618.17	610.52	597.00		600.69	580.02	652.87		628.86
7	1071.60	949.68		973.26	929.90	919.97		922.99	842.62	905.62		881.17	749.95	861.32		824.37
8	1137.40	1472.52		1383.60	1109.20	1238.93		1202.42	1196.19	1201.61		1200.24	1349.78	1229.28		1250.78
9	2079.88	2121.74		2113.69	1746.71	1554.51		1599.97	1519.39	1452.46		1465.31	1447.85	1596.19		1567.02
10	1955.36	2589.58		2582.74	1984.23	2335.36		2230.29	1697.61	1933.97		1857.48	2082.83	2270.63		2228.98
11	2353.97	2577.49		2572.25	2311.21	2518.49		2477.68	2400.76	2609.32		2575.31	2587.59	2563.85		2566.13
12	2382.17	3329.21		3209.17	2311.07	3210.99		3156.23	2651.20	3212.10		3187.98	2415.29	2829.70		2798.91
13		3985.49		3985.49		3744.53		3744.53		3895.20		3895.20	2394.54	3265.95		3244.91
14		4192.49		4192.49		3930.94		3930.94		4279.70		4279.70	2776.65	4046.55		3954.88
15		3938.40		3938.40		4436.54		4436.54		4582.34		4582.34		5165.18		5165.18
16		6075.54		6075.54		5050.97		5050.97		6491.86		6491.86		5341.58		5341.58
17		7169.24		7169.24		6531.47		6531.47		7189.86		7189.86		6321.42		6321.42
18		5399.97		5399.97		7291.34		7291.34		8870.58		8870.58		6728.72		6728.72
19														8438.94		
20		7425.48		7425.48												
Total	253.22	641.05	14.70	479.86	309.66	546.40	23.85	448.49	321.18	685.86	17.97	543.42	499.82	1372.61	14.24	1099.29

	2001				2002				2003				2004			
Age	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
0																
1	17.67	18.11	13.83	17.46	15.14	14.50	9.34	14.61	14.11	15.23	5.61	14.52	10.42	12.22	8.31	11.43
2	72.73	76.07	20.71	74.46	86.34	67.13	18.23	76.94	91.73	100.14	11.06	96.43	33.56	33.64	16.36	33.52
3	102.53	131.24		118.59	112.95	117.93		116.09	233.36	235.69		234.55	122.17	185.37		161.68
4	267.65	353.39		319.37	292.66	279.08		283.79	377.84	384.02		381.15	275.30	314.81		295.11
5	473.87	553.44		520.12	416.24	478.65		452.56	598.15	557.83		567.51	470.59	475.11		473.92
6	688.72	745.61		728.13	698.04	678.34		685.03	835.78	828.37		830.75	699.22	722.49		711.83
7	893.22	1033.42		989.46	1034.27	972.81		988.04	1140.51	1222.01		1193.48	1116.37	1080.37		1089.82
8	1446.77	1454.64		1453.95	1402.69	1324.80		1329.33	1499.31	1561.90		1552.77	1277.86	1494.84		1405.23
9	1621.82	1773.42		1743.98		1643.07		1643.07	1696.71	1961.77		1942.84	1699.75	1764.42		1744.53
10	1748.23	2054.00		1952.68		2042.54		2042.54		2241.89		2241.89	1890.08	2055.52		1956.26
11	1932.85	2443.84		2404.43		2298.76		2298.76		2380.78		2380.78	2200.49	2398.03		2279.50
12	2186.97	2817.26		2781.83		3716.64		3716.64		3428.49		3428.49		2324.95		2324.95
13	2342.35	3450.32		3322.86		4688.33		4688.33		4308.25		4308.25		3642.72		3642.72
14	4033.42	4184.13		4181.34		6704.09		6704.09		5272.40		5272.40		4034.69		4034.69
15		5100.55		5100.55		6963.24		6963.24						7022.04		7022.04
16		5899.08		5899.08												
17		6678.14		6678.14						8458.35		8458.35				
18																
19		8790.83														
20																
Total	258.79	712.56	13.90	525.95	215.67	388.58	9.38	314.39	259.40	372.68	5.64	324.89	171.44	262.90	11.94	220.77

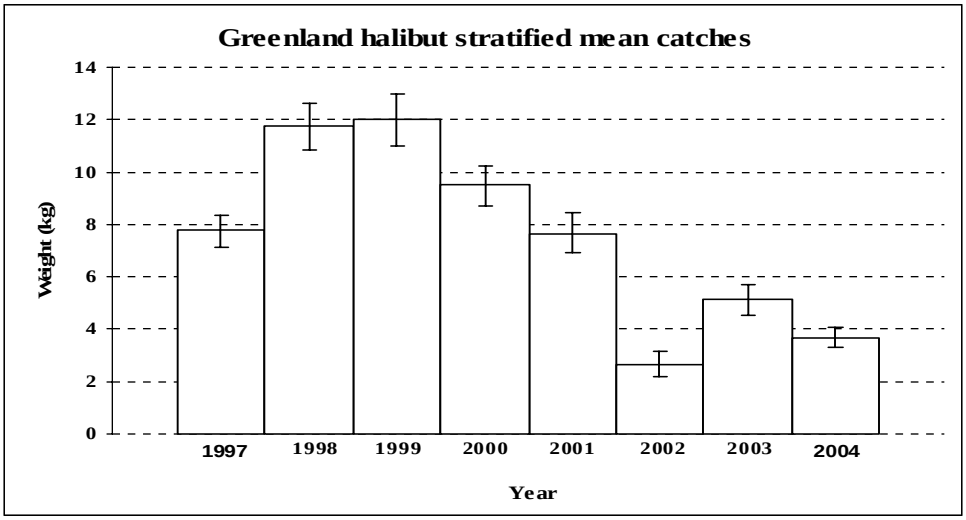

FIGURE 1.- Greenland halibut stratified mean catches in Kg and ±SD by year. Spanish Spring surveys on NAFO Div. 3NO: 1997-2004 (1997-2000 transformed data from C/V *Playa de Menduíña*; 2002-2004 original data from R/V *Vizconde de Eza*. In 2001, there are data from the two vessels).

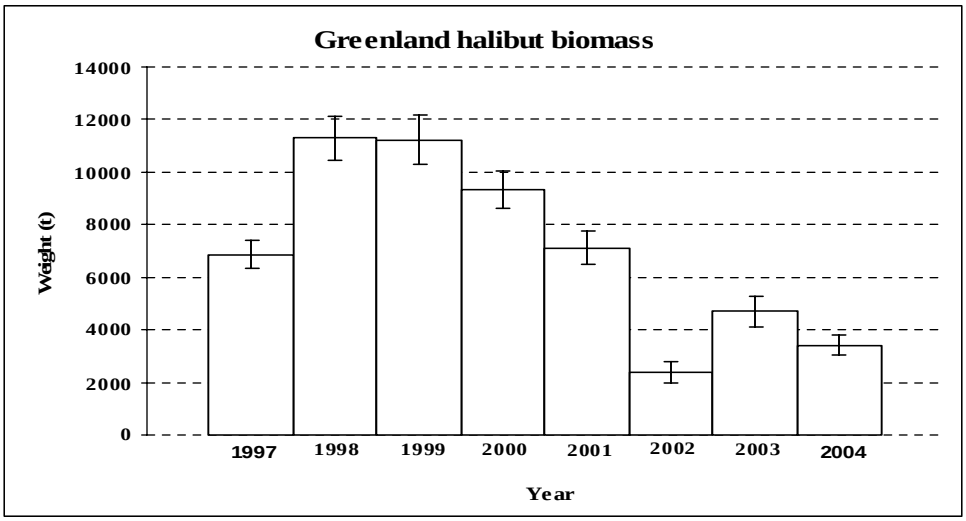

FIGURE 2.- Greenland halibut biomass in tons and ±SD by year. Spanish Spring surveys on NAFO Div. 3NO: 1997-2004 (1997-2000 transformed data from C/V *Playa de Menduíña*; 2002-2004 original data from R/V *Vizconde de Eza*. In 2001, there are data from the two vessels).

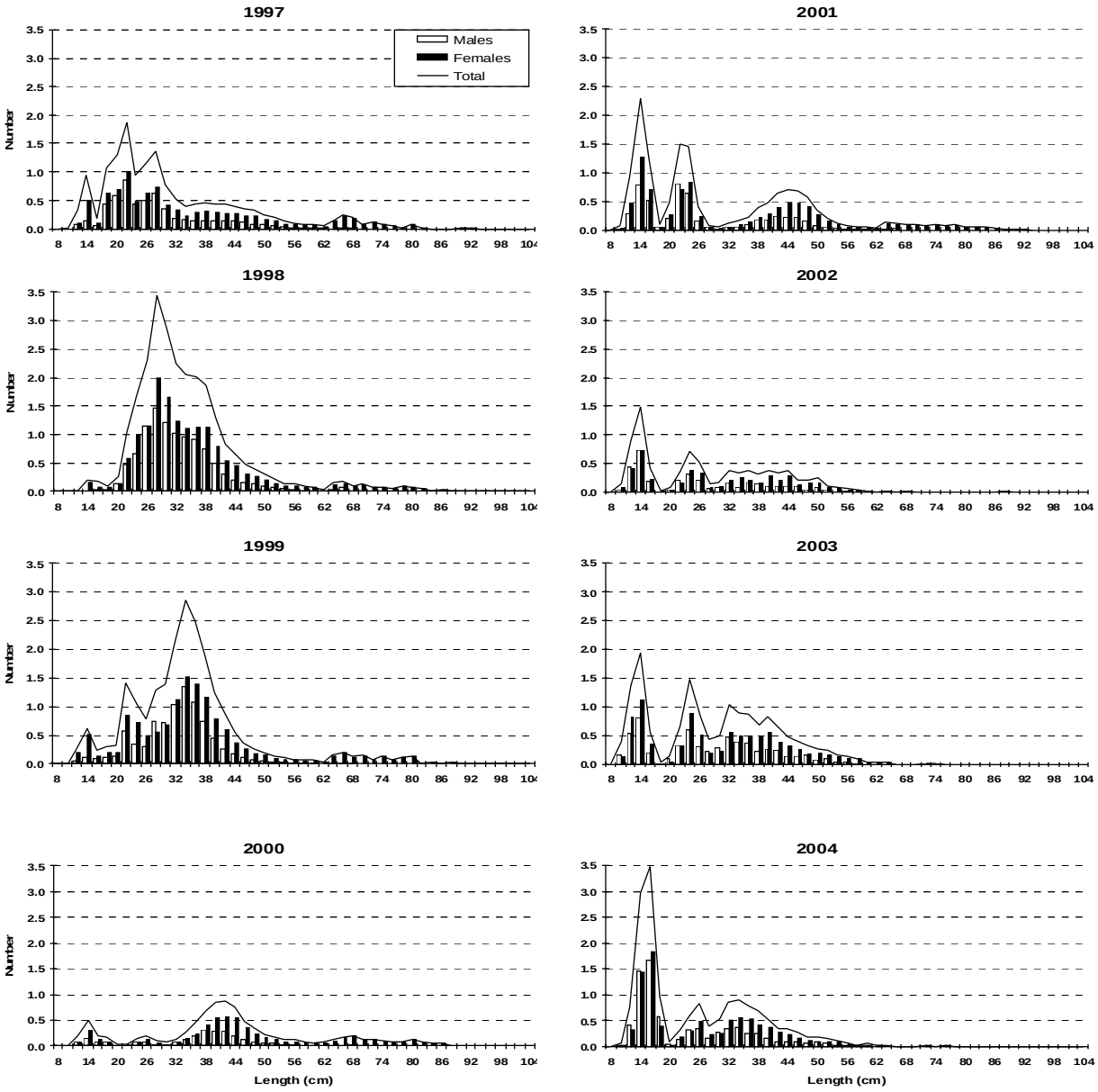

FIGURE 3.- Greenland halibut length distribution (cm) on NAFO 3NO: 1997-2004. Number per stratified mean catches. 1997-2000 data are transformed data from C/V *Playa de Menduíña*, and 2002-2004 data are original from R/V *Vizconde de Eza*. In 2001, there are data from the two vessels.

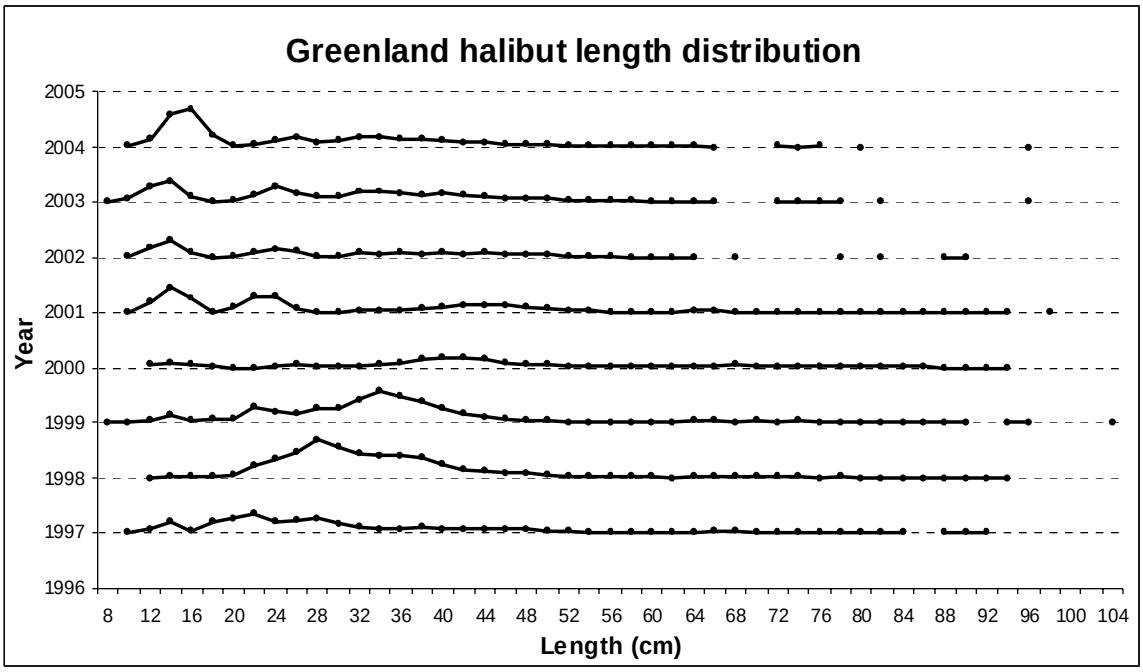

FIGURE 4.- Greenland halibut length distribution (cm) on NAFO 3NO: 1997-2004.

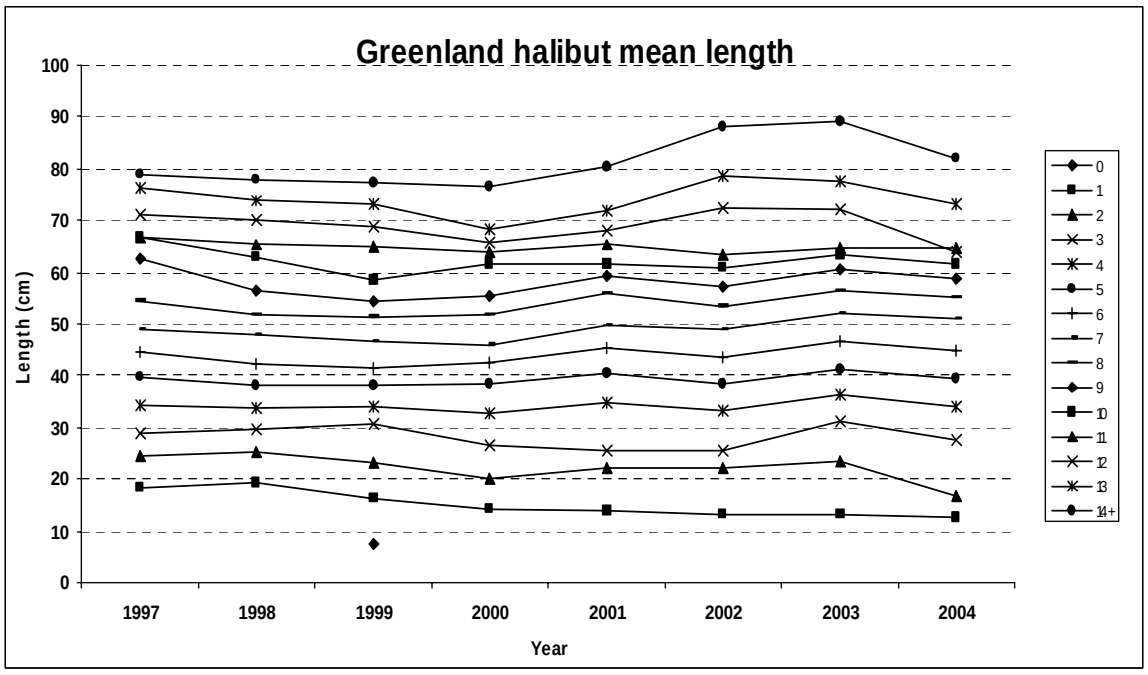

FIGURE 5.- Greenland halibut mean length (cm) at age on NAFO 3NO: 1997-2004. Ages from 0 to 14+.

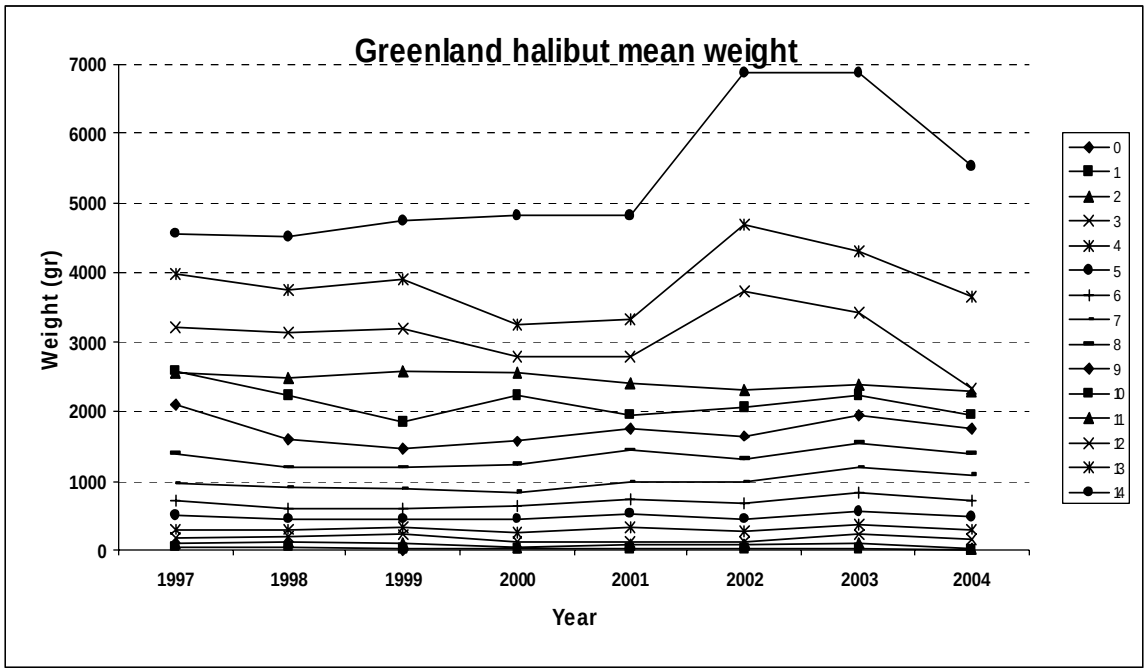

FIGURE 6.- Greenland halibut mean weight (gr) at age on NAFO 3NO: 1997-2004. Ages from 0 to 14+.