Northwest Atlantic   Fisheries Organization

SCIENTIFIC COUNCIL MEETING – JUNE 2005

American Plaice and Yellowtail Flounder Indices from the Spanish Survey Conducted in
Divisions 3NO of the NAFO Regulatory Area

by

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Abstract

Since 1995, Spain carries out a stratified random spring bottom trawl survey in Divisions 3NO of the NAFO Regulatory Area. In 2001, the trawl vessel and gear were replaced; so, the time series indices were transformed. The transformed entire series of mean catches, biomass and length distribution for American plaice (*Hippoglossoides platessoides*) are presented for the period 1997-2000 and for Yellowtail flounder (*Limanda ferruginea*) for the period 1995-2000, and the both species no-transformed data for the years 2002-2004. For 2001, there are data from the two vessels. For American plaice we can see an increasing trend along the whole period. For this species, a good recruitment can be seen in 2004. For Yellowtail flounder, this is no a clear trend since 1998; its indices are almost constant along this period.

Material and Methods

Survey design and gear used

The survey in Div. 3NO of NAFO Regulatory Area was initiated by Spain in 1995. Until 2001, the survey was carried out in spring (May), on board the Spanish vessel C/V *Playa de Menduiña* (338 GT and 800 HP) using bottom trawl net type *Pedreira*. Since 2001, the R/V *Vizconde de Eza* replaced the C/V *Playa de Menduíña* as the research vessel for the survey, and *Campelen* net replaced *Pedreira* net as survey gear. The main specifications and geometry of these gears, as the rigging profile and the net plan, and a sheet with the resume of the main technical data of the survey are described in a previous paper (Walsh *et. al.*, 2001). Table 1 presents the number of valid tows, the depth strata covered and the dates of the survey series. The survey area was stratified following the standard stratification schemes (Bishop, 1994). Set number was allocated to strata proportionally to their size, with a minimum of two planned hauls per stratum and the trawl positions were chosen at random (Doubleday, 1981).

Biomass and abundance indices were calculated by the swept area method (Cochran, 1997), assuming catchability factor of 1.

For American plaice, the series are presented since 1997 because in years 1995 and 1996 the surveyed depth strata were only until 1 000 meters, so they are not representative. As the strata where the Yellowtail flounder is presented were well surveyed, the series for this species are presented since 1995.

The catch from each haul was sorted by species and weighted. Random samples of each species catches were measured to total length to the nearest lower cm. Length distribution scaled from catches was estimated for the period 1997-2004 (American plaice) and 1995-2004 (yellowtail flounder) in two cm range.

R/V *Vizconde de Eza* replaced C/V *Playa de Menduíña* in 2001 survey, so, in order to maintain the data series obtained since 1995, comparative fishing trials were conducted in spring 2001 to estimate factors between the two fishing vessels and gear combinations. A series of 92 paired hauls was carried out, 90 of then were valid hauls. In this 90 hauls, there are included 7 hauls from the spring Canadian survey on board R/V *Wilfred Templeman*, made during the comparative experience between the three vessels. Mean catch, stratified mean catch, biomass and their respective standard deviations were transformed from C/V *Playa de Menduíña* series to R/V *Vizconde de Eza* series by a Factor Power Correction (FPC). Length distribution was transformed, too, length by length, by a method performed by Warren. For details, see González Troncoso *et al.*, 2004

For each species, the haul mean catch, with its variance, and the stratified mean catches by stratum and year, with the annual variance, are presented, transformed until 2000 and no-transformed in the period 2002-2004. In 2001, the deeper strata were not surveyed by the calibration experience, so, to obtain the more annual homogeneity possible in the series, in the no surveyed strata by the R/V *Vizconde de Eza* the transformed C/V *Playa de Menduíña* data were put, whilst in the strata surveyed the original R/V *Vizconde de Eza* data are presented. Besides this, in 2001 there were five hauls made by the C/V *Playa de Menduíña* in five strata surveyed by the R/V *Vizconde de Eza* too. These five hauls were transformed, too, and incorporated to the R/V *Vizconde de Eza* catches. These hauls were missing last year, so this year the 2001 indices were updated with this information. To more information about the calculation of these indices, see González Troncoso *et al.*, 2004.

Besides this, the biomass per stratum and year, with the annual variance, are presented, as the length distribution in number per haul stratified mean catch.

Results

American plaice

American plaice is in moratorium since 1993, but there are catches of this species, specially as by catch in the skate and Greenland halibut fisheries. In the Canadian surveys, indices show a large decline from the mid to late 1980s to the mid-1990s followed by a slight increase since 1996. This survey indicates no substantial recruitment since 1989, although estimated strength for the 1995-1998 cohorts have shown successive improvement (Morgan *et al.*, 2003).

Mean Catches and Biomass

American plaice haul mean catches by stratum are presented in Table 2, included swept area, number of hauls and SD. Stratified haul mean catches by stratum and year and their SD are presented in Table 3.

The entire time series (1997-2004) of biomass and their SD estimates of American plaice are presented in Table 4. Besides the biomass by stratum, we present the total biomass obtained from the length distribution in the lowest part of the Table 4. Parameters a and b are presented in Table 5.

The American plaice indices show a general increasing trend along the years, agree with the results from the Canadian surveys. We can see a decreasing until the year 2002 and an increasing in the last two years, 2003 and 2004 (Fig. 1 and 2). 2004 value is the second higher of the series, after the 2000 value.

Length Distribution

Table 6 and Figures 3 and 4 show the length distribution per haul stratified mean catches by sex and year, besides the sampled size and its catch, for the period 1997-2004. The data have been grouped two by two, so we present the data every two cm. The modal length is easily identified each year. In 1999, there was a modal length at 12 cm that can be followed until the present year. This can be the 1995-1998 cohorts that find the Canadian surveys. 2004 has two modal classes, at 34 cm (the result of the evolution of the modal length of previous years) and the 8-10 cm classes, which indicated a quite good recruitment. We must wait to see the results of this good recruitment. Anyway, last years we can see the presence of more small fish. It can be due to the increased efficiency catching small fish of the new Campelen survey gear over the old gear (Paz *et al.*, 2000, Román *et al.*, 2001).

Yellowtail flounder

After a moratorium between 1994 and 1997, the yellowtail flounder fishery is under TAC. Following the Canadian data, this species had a minimum in the mid-1990s, but since then the biomass is increasing and these last years is in their maximum value in the period 1984-2004 (Brodie *et al.*, 2004)

Mean Catches and Biomass

In Table 7 we present the haul mean catches by stratum for yellowtail flounder, included swept area, number of hauls and SD. The stratified haul mean catches by stratum and year and their SD are presented in Table 8 for this species.

The entire time series (1995-2004) of biomass by the swept area method and their SD estimates of yellowtail flounder are presented in Table 9, with the biomass calculated from the length distribution by the parameters a and b of the length-weight relationship, which are presented in Table 10.

The yellowtail flounder indices show no clear trend along the time (in the entire series). Anyway, there was a decreasing since 2001 broken this year with a slight increasing in the indices (Fig. 5 and 6).

Length Distribution

The length distribution per haul stratified mean catches by sex and year, besides the sampled size and its catch, are presented in Table 11 and Fig. 7 the period 1995-2004. The data have been grouped two by two**,** so we present the data every two cm. There is no presence of good recruitment last years. In Figure 8, we can see the evolution of a modal value since the beginning of the series, but, although there is a presence of juveniles in the lengths, this presence is very low. This presence seems to be due, like in American plaice, to the major efficiency catching small fish of the new gear.

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TABLE 1.- Spanish spring bottom trawl surveys on NAFO Div. 3NO: 1995-2004

Year	Vessel	Valid tows	Depth strata covered (m)	Dates
1995	C/V *Playa de Menduíña*	77	56-731	May 18-May 29
1996	C/V *Playa de Menduíña*	112	56-1098	May 07-May 24
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-June 02
2004	R/V *Vizconde de Eza*	120	56-1464	June 06–June 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 American plaice 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 Menduiña* 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			
Stratum	Swept area	Tow number	A. Plaice Mean catch	A. Plaice SD	Swept area	Tow number	A. Plaice Mean catch	A. Plaice SD	Swept area	Tow number	A. Plaice Mean catch	A. Plaice SD	Swept area	Tow number	A. Plaice Mean catch	A. Plaice SD
353	0.0480	4	47.97	25.084	0.0465	4	267.95	103.830	0.0360	3	388.97	37.624	0.0356	3	426.02	210.639
354	0.0233	2	34.16	18.447	0.0356	3	381.49	146.407	0.0218	2	184.12	100.017	0.0356	3	147.44	84.780
355	0.0233	2	14.02	4.617	0.0221	2	134.67	132.931	0.0229	2	60.82	30.122	0.0233	2	60.01	1.539
356	0.0225	2	8.15	4.133	0.0221	2	14.23	5.343	0.0229	2	31.47	23.877	0.0225	2	28.11	24.368
357	0.0443	4	1.86	1.051	0.0240	2	2.33	0.484	0.0236	2	3.06	1.913	0.0124	1	0.55	-
358	0.0563	5	4.44	4.415	0.0236	3	6.73	1.265	0.0349	3	9.06	15.047	0.0341	3	298.64	437.609
359	0.0690	6	30.12	15.773	0.0698	6	198.60	199.740	0.0364	3	484.88	84.636	0.0469	4	659.75	139.208
360	0.3754	32	26.15	17.839	0.2561	25	107.53	64.858	0.2325	19	263.77	91.624	0.2396	20	324.76	269.238
374	0.0353	3	8.40	3.170	0.0353	3	4.00	0.906	0.0244	2	44.00	1.495	0.0240	2	5.60	0.440
375	0.0116	1	1.85	-	0.0345	3	5.93	3.550	0.0236	2	42.21	15.545	0.0244	2	30.11	9.300
376	0.1583	14	12.53	8.741	0.0930	10	82.92	73.283	0.1219	10	119.90	62.748	0.1200	10	250.98	179.289
377	0.0116	1	20.96	-	0.0229	2	47.18	59.694	0.0240	2	86.16	117.320	0.0229	2	27.02	29.064
378	0.0210	2	1.87	1.583	0.0120	2	5.22	2.199	0.0229	2	7.14	4.199	0.0233	2	19.74	22.646
379	0.0206	2	1.78	1.568	0.0356	3	2.65	1.804	0.0236	2	0.78	0.308	0.0225	2	2.30	1.146
380	0.0210	2	1.41	0.079	0.0113	2	1.69	0.945	0.0236	2	2.22	0.066	0.0236	2	1.74	0.402
381	0.0221	2	1.55	0.895	0.0229	2	8.41	10.927	0.0229	2	0.59	0.231	0.0236	2	2.03	1.269
382	0.0461	4	0.59	0.340	0.0229	3	4.35	3.017	0.0484	4	2.25	0.610	0.0499	4	1.92	0.562
721	0.0221	2	13.40	12.225	0.0203	2	7.68	6.464	0.0244	2	20.06	10.378	0.0236	2	4.21	4.725
722	0.0214	2	46.66	65.850	0.0101	2	1.99	2.375	0.0229	2	2.43	0.704	0.0218	2	1.21	1.715
723	0.0210	2	8.79	5.464	0.0233	2	10.04	8.619	0.0229	2	34.05	29.946	0.0248	2	10.67	7.344
724	0.0225	2	13.33	17.024	0.0206	2	10.84	2.528	0.0225	2	9.89	10.466	0.0233	2	12.31	1.803
725	0.0206	2	1.31	0.882	0.0086	1	0.62	-	0.0229	2	2.48	0.073	0.0210	2	8.64	8.707
726	n.s.	n.s.	n.s.	n.s.	0.0094	2	2.95	2.726	0.0225	2	39.96	47.051	0.0221	2	8.24	4.177
727	0.0094	1	9.37	-	0.0233	2	9.02	3.782	0.0236	2	7.56	7.651	0.0210	2	4.59	2.089
728	0.0214	2	32.09	23.965	0.0206	2	15.58	4.617	0.0233	2	37.93	22.294	0.0210	2	22.82	0.178
752	0.0218	2	112.70	128.072	0.0229	2	49.95	7.102	0.0233	2	35.68	10.927	0.0206	2	128.14	25.680
753	0.0214	2	56.78	41.643	0.0218	2	146.98	13.280	0.0229	2	14.74	4.969	0.0218	2	169.96	216.964
754	0.0330	3	5.50	6.447	0.0210	2	2.67	3.782	0.0206	2	0.00	0.000	0.0195	2	0.00	0.000
755	n.s.	n.s.	n.s.	n.s.	0.0206	2	0.39	0.550	0.0311	3	0.05	0.090	0.0431	4	0.00	0.000
756	0.0109	1	75.68	-	0.0225	2	199.76	258.188	0.0225	2	124.34	44.457	0.0203	2	31.68	11.829
757	0.0304	3	626.06	753.372	0.0206	2	82.24	100.918	0.0233	2	17.07	3.782	0.0214	2	5.12	6.827
758	0.0214	2	0.60	0.447	0.0105	2	4.03	5.695	0.0214	2	0.31	0.438	0.0210	2	1.32	1.649
759	n.s.	n.s.	n.s.	n.s.	0.0214	2	0.00	0.000	0.0218	2	0.34	0.484	0.0210	2	1.99	2.814
760	0.0105	1	17.16	-	0.0214	2	8.04	5.519	0.0225	2	20.30	28.275	0.0210	2	43.59	58.396
761	0.0315	3	1.21	1.954	0.0206	2	3.47	1.605	0.0210	2	0.00	0.000	0.0221	2	0.19	0.264
762	0.0308	3	0.00	0.000	0.0094	2	0.00	0.000	0.0210	2	18.49	26.142	0.0203	2	0.00	0.000
763	n.s.	n.s.	n.s.	n.s.	0.0218	2	0.08	0.110	0.0311	3	0.00	0.000	0.0416	4	0.30	0.606
764	0.0206	2	0.17	0.237	0.0218	2	0.25	0.352	0.0225	2	0.00	0.000	0.0218	2	0.00	0.000
765	0.0206	2	0.00	0.000	0.0098	2	0.00	0.000	0.0221	2	0.00	0.000	0.0203	2	0.00	0.000
766	0.0308	3	0.00	0.000	0.0191	2	0.00	0.000	0.0218	2	0.00	0.000	0.0214	2	0.00	0.000
767	n.s.	n.s.	n.s.	n.s.	0.0109	2	0.00	0.000	0.0214	2	0.00	0.000	0.0210	2	0.11	0.156

$$(**)\,SD = \frac{\sum\left(x_i - \bar{x}\right)^2}{n-1}$$

TABLE 2 (cont.). Swept area, number of hauls and American plaice 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.

Stratum	2001 Swept area	Tow number	A. Plaice Mean catch	A. Plaice	2002 Swept area	Tow number	A. Plaice Mean catch	A. Plaice SD	2003 Swept area	Tow number	A. Plaice Mean catch	A. Plaice SD	2004 Swept area	Tow number	A. Plaice Mean catch	A. Plaice SD
353	0.0341	3	451.08	185.936	0.0476	4	630.50	240.448	0.0334	3	470.86	217.828	0.033750	3	418.60	276.823
354	0.0338	3	172.21	144.326	0.0356	3	207.67	77.048	0.0338	3	806.33	68.178	0.034500	3	220.64	173.634
355	0.0240	2	206.75	85.065	0.0236	2	100.75	40.659	0.0229	2	112.14	7.297	0.022875	2	23.50	9.758
356	0.0240	2	83.56	40.362	0.0233	2	53.95	51.548	0.0225	2	159.80	99.561	0.022125	2	0.66	0.893
357	0.0244	2	76.85	105.720	0.0240	2	5.18	2.015	0.0229	2	59.40	76.650	0.022875	2	0.84	1.190
358	0.0345	3	35.80	28.161	0.0345	3	27.67	21.202	0.0338	3	26.50	16.096	0.033000	3	27.72	15.234
359	0.0803	7	347.89	328.624	0.0686	6	177.40	129.497	0.0791	7	459.09	433.737	0.079125	7	440.97	296.394
360	0.2423	20	261.79	173.177	0.2865	25	143.72	117.177	0.2254	20	229.12	120.612	0.231000	20	283.51	168.955
374	0.0240	2	14.95	1.909	0.0345	3	3.42	1.630	0.0225	2	15.33	4.207	0.023250	2	89.95	46.315
375	0.0338	3	4.77	1.680	0.0353	3	1.41	1.073	0.0330	3	9.96	10.915	0.033750	3	73.12	19.172
376	0.1155	10	46.95	32.487	0.1140	10	47.96	50.207	0.1125	10	62.92	55.173	0.116625	10	195.37	112.407
377	0.0229	2	21.09	10.204	0.0229	2	34.05	39.527	0.0225	2	48.61	30.816	0.021750	2	84.23	73.928
378	0.0236	2	2.75	1.287	0.0233	2	8.10	6.364	0.0225	2	9.42	8.040	0.022500	2	34.30	14.001
379	0.0229	2	0.84	0.092	0.0229	2	5.75	5.445	0.0229	2	3.47	4.667	0.012375	1	0.71	-
380	0.0206	2	2.97	0.638	0.0225	2	7.25	1.768	0.0229	2	6.68	0.735	0.022125	2	2.01	2.174
381	0.0236	2	2.35	0.154	0.0229	2	3.81	2.821	0.0229	2	7.70	3.111	0.022500	2	29.64	18.611
382	0.0469	4	3.02	0.929	0.0341	3	1.09	0.904	0.0454	4	2.12	0.643	0.046125	4	55.76	49.674
721	0.0248	2	115.20	86.974	0.0233	2	18.20	12.445	0.0225	2	222.75	273.155	0.022125	2	0.00	-
722	0.0233	2	30.29	35.511	0.0236	2	30.10	42.568	0.0221	2	14.31	15.493	0.021750	2	1.02	1.442
723	0.0240	2	36.15	39.244	0.0233	2	7.20	0.849	0.0229	2	2.10	2.687	0.022875	2	0.68	0.955
724	0.0353	3	26.47	26.158	0.0225	2	47.05	41.931	0.0225	2	7.02	7.050	0.021375	2	0.00	0.000
725	0.0116	2	3.37	0.368	0.0225	2	3.55	4.313	0.0229	2	3.34	0.049	0.022500	2	19.30	27.294
726	0.0116	2	1.80	0.430	0.0214	2	2.83	0.948	0.0225	2	0.00	0.000	0.022500	2	0.00	0.000
727	0.0225	2	8.46	5.277	0.0233	2	2.85	1.061	0.0218	2	42.85	21.001	0.023250	2	0.37	0.338
728	0.0229	2	5.85	1.143	0.0229	2	9.58	13.467	0.0225	2	40.45	23.264	0.018000	2	0.00	0.000
752	0.0210	2	15.79	7.922	0.0116	1	0.00	-	0.0229	2	27.05	12.516	0.021375	2	0.00	0.000
753	0.0214	2	60.01	68.290	0.0229	2	3.60	5.091	0.0229	2	0.00	0.000	0.021750	2	0.00	0.000
754	0.0195	2	1.26	1.781	0.0341	3	8.60	14.206	0.0218	2	0.00	0.000	0.021375	2	0.00	0.000
755	0.0416	4	0.00	0.000	0.0338	3	0.00	0.000	0.0221	2	0.00	0.000	0.031875	3	0.00	0.000
756	0.0113	2	11.58	8.167	0.0229	2	11.73	12.551	0.0221	2	1.83	0.884	0.021750	2	0.00	0.000
757	0.0233	2	105.18	148.295	0.0225	2	31.15	13.223	0.0221	2	5.17	7.304	0.021750	2	0.00	0.000
758	0.0218	2	0.16	0.220	0.0225	2	1.27	0.523	0.0221	2	0.00	0.000	0.021375	2	0.00	0.000
759	0.0221	2	0.26	0.374	0.0225	2	0.00	0.000	0.0113	1	0.00	-	0.021375	2	0.00	0.000
760	0.0229	2	37.80	37.618	0.0229	2	4.75	6.718	0.0218	2	0.00	0.000	0.022125	2	0.00	0.000
761	0.0225	2	0.25	0.346	0.0225	2	1.90	1.577	0.0225	2	0.00	0.000	0.022125	2	0.01	0.007
762	0.0116	2	0.00	0.000	0.0225	2	0.30	0.424	0.0225	2	0.00	0.000	0.023250	2	0.00	0.000
763	0.0330	3	0.00	0.000	0.0225	2	0.00	0.000	0.0311	3	0.00	0.000	0.032625	3	0.00	0.000
764	0.0240	2	0.35	0.205	0.0236	2	0.50	0.707	0.0221	2	0.63	0.884	0.022875	2	0.00	0.000
765	0.0113	2	0.05	0.071	0.0236	2	0.64	0.792	0.0113	1	0.00	-	0.022500	2	0.00	0.000
766	0.0203	2	0.44	0.616	0.0233	2	0.00	0.000	0.0225	2	0.00	0.000	0.022500	2	0.00	0.000
767	0.0218	2	0.00	0.000	0.0225	2	0.05	0.071	0.0229	2	0.00	0.000	0.021750	2	0.57	0.799

$$(**)\,SD = \frac{\sum\left(x_i - \bar{x}\right)^2}{n-1}$$

TABLE 3.- Stratified mean catches (Kg) by stratum and year and SD by year of American plaice (1997-2004). n.s. means stratum not surveyed. 1997-2000 data are transformed C/V *Playa de Menduíña* data. 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	12903.67	72078.57	104632.35	114599.70	121339.62	169604.50	126660.44	112602.50
354	8402.49	93846.24	45293.87	36269.52	42363.66	51086.00	198357.18	54277.44
355	1037.72	9965.35	4500.63	4440.80	15299.50	7455.50	8298.36	1739.00
356	382.89	668.59	1478.94	1321.33	3927.32	2535.65	7510.60	30.95
357	304.55	382.45	502.29	90.77	12602.58	848.70	9741.60	138.01
358	999.88	1513.72	2037.49	67195.07	8055.00	6225.00	5962.50	6236.25
359	12680.29	83608.73	204132.53	277756.52	146459.89	74685.40	193275.09	185648.37
360	72766.01	299247.75	734066.28	903798.01	728547.66	399985.01	637653.48	789018.07
374	1796.59	856.16	9415.49	1197.73	3199.30	731.88	3279.55	19249.30
375	500.53	1606.63	11438.83	8160.97	1291.77	381.21	2698.26	19816.42
376	16719.30	110620.38	159942.67	334810.31	62631.30	63978.64	83931.28	260619.58
377	2095.72	4718.47	8616.07	2702.20	2108.50	3405.00	4861.00	8422.50
378	259.32	726.10	991.91	2744.49	382.25	1125.90	1308.69	4767.70
379	188.36	281.25	82.40	243.73	88.51	609.50	367.82	75.26
380	134.92	162.68	213.43	167.31	285.07	696.00	641.28	193.20
381	222.76	1211.16	84.85	291.71	338.05	547.92	1108.80	4268.16
382	202.64	1493.12	770.56	657.24	1037.19	372.73	726.30	19126.54
721	871.09	499.21	1303.60	273.96	7488.00	1183.00	14478.75	0.00
722	3919.11	167.16	203.73	101.86	2544.36	2528.40	1201.62	85.68
723	1362.72	1556.71	5277.38	1653.10	5603.25	1116.00	325.50	104.63
724	1653.48	1343.68	1226.09	1526.83	3281.87	5834.20	869.86	0.00
725	137.94	65.30	260.04	907.63	353.82	372.75	350.18	2026.50
726	n.s	212.68	2876.79	593.27	129.33	203.76	0.00	0.00
727	899.68	865.65	725.35	440.29	811.92	273.60	4113.60	35.42
728	2502.92	1215.08	2958.88	1780.30	455.96	747.05	3155.10	0.00
752	14763.59	6543.72	4674.08	16785.97	2068.61	0.00	3543.55	0.00
753	7835.24	20283.24	2033.90	23454.24	8281.50	496.80	0.00	0.00
754	989.34	481.33	0.00	0.00	226.67	1548.60	0.00	0.00
755	n.s	149.64	19.95	0.00	0.00	0.00	0.00	0.00
756	7643.89	20175.92	12558.72	3200.13	1169.09	1184.23	184.33	0.00
757	63857.75	8388.77	1741.19	522.51	10728.11	3177.30	526.83	0.00
758	59.81	398.64	30.63	130.83	15.39	125.73	0.00	0.00
759	n.s	0.00	43.44	252.73	33.57	0.00	0.00	0.00
760	2643.21	1237.81	3126.85	6713.38	5821.20	731.50	0.00	0.00
761	206.83	592.85	0.00	31.90	41.90	324.05	0.00	0.86
762	0.00	0.00	3918.87	0.00	0.00	63.60	0.00	0.00
763	n.s	20.29	0.00	79.13	0.00	0.00	0.00	0.00
764	16.71	24.87	0.00	0.00	34.50	50.00	62.50	0.00
765	0.00	0.00	0.00	0.00	6.20	79.36	0.00	0.00
766	0.00	0.00	0.00	0.00	62.68	0.00	0.00	0.00
767	n.s	0.00	0.00	17.44	0.00	7.90	0.00	89.27
TOTAL	240960.96	747209.90	1331180.06	1814912.89	1199115.08	804322.34	1315194.03	1488571.60
$\left(\overline{Y}\right)$	25.80	72.25	128.72	175.49	115.95	77.77	127.17	143.93
S.D.	5.09	6.51	6.85	19.24	12.31	7.46	10.79	13.03

TABLE 4.- Survey estimates (by the swept area method) of American plaice 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. 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	1075	6200	8719	9651	10666	14245	11385	10009
354	723	7903	4165	3054	3766	4302	17632	4720
355	89	901	393	382	1275	631	726	152
356	34	60	129	117	327	218	668	3
357	28	32	43	7	1034	71	852	12
358	89	130	175	5907	700	541	530	567
359	1103	7192	16836	23702	12775	6530	17099	16424
360	6203	25808	59988	75434	60151	34903	56586	68313
374	153	73	773	100	267	64	292	1656
375	43	140	968	670	115	32	245	1761
376	1479	9578	13124	27901	5422	5612	7461	22347
377	180	413	718	236	184	298	432	774
378	25	62	87	236	32	97	116	424
379	18	24	7	22	8	53	32	6
380	13	14	18	14	28	62	56	17
381	20	106	7	25	29	48	97	379
382	18	131	64	53	88	33	64	1659
721	79	49	107	23	605	102	1287	0
722	367	16	18	9	219	214	109	8
723	130	134	461	134	467	96	28	9
724	147	130	109	131	279	519	77	0
725	13	8	23	86	30	33	31	180
726	n.s.	21	256	54	11	19	0	0
727	96	74	61	42	72	24	378	3
728	234	118	255	170	40	65	280	0
752	1358	572	402	1628	197	143	310	0
753	733	1865	178	2157	775	43	0	0
754	90	46	0	0	23	6	0	0
755	n.s.	15	2	0	0	0	0	0
756	703	1793	1116	316	102	104	17	0
757	6307	813	150	49	923	282	48	0
758	6	37	3	12	1	11	0	0
759	n.s.	0	4	24	3	0	0	0
760	252	116	278	639	509	64	0	0
761	20	57	0	3	4	29	0	0
762	0	0	373	0	0	6	0	0
763	n.s.	2	0	8	0	0	0	0
764	2	2	0	0	3	4	6	0
765	0	0	0	0	1	7	0	0
766	0	0	0	0	6	0	0	0
767	n.s.	0	0	2	0	1	0	8
TOTAL	21827	64635	110010	152997	101137	69511	116842	129432
S.D.	4495	5946	5825	16740	10841	7097	9777	12335

TABLE 5. Length weight relationships in the calculation of American plaice biomass. The equation is $Weight = a\left(l + 0.5\right)^{b}$
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	0.0043	0.0041	0.0049	0.0024	0.0064	0.0041	0.0037	0.0075
		Error = 0.1296	Error = 0.1200	Error = 0.2799	Error = 0.1281	Error = 0.1556	Error = 0.0660	Error = 0.0752	Error = 0.1483
	b	3.1794	3.1943	3.1454	3.3523	3.0742	3.1930	3.2287	3.0284
		Error = 0.0378	Error = 0.0348	Error = 0.0817	Error = 0.0382	Error = 0.0485	Error = 0.0205	Error = 0.0234	Error = 0.0468
		R^2 = 0.995	R^2 = 0.996	R^2 = 0.983	R^2 = 0.995	R^2 = 0.992	R^2 = 0.988	R^2 = 0.998	R2 = 0.992
		N = 1050	N = 573	N = 183	N = 321	N = 188	N = 384	N = 622	N = 411
Females	a	0.0027	0.0027	0.0048	0.0020	0.0039	0.0032	0.0030	0.0047
		Error = 0.1058	Error = 0.0595	Error = 0.1420	Error = 0.0981	Error = 0.0624	Error = 0.0628	Error = 0.0549	Error = 0.0807
	b	3.3263	3.3218	3.1704	3.4049	3.2256	3.2752	3.2918	3.1757
		Error = 0.0291	Error = 0.0162	Error = 0.0389	Error = 0.0271	Error = 0.0177	Error = 0.0178	Error = 0.0157	Error = 0.0228
		R^2 = 0.998	R^2 = 0.999	R^2 = 0.993	R^2 = 0.998	R^2 = 0.998	R^2 = 0.998	R^2 = 0.999	R2 = 0.997
		N = 1396	N = 937	N = 201	N = 402	N = 370	N = 703	N = 960	N = 765
Indet.	a	0.0026	0.0028	0.0022	0.0020	0.0054	0.0035	0.0032	0.0069
		Error = 0.0928	Error = 0.0602	Error = 0.1531	Error = 0.0817	Error = 0.0866	Error = 0.0599	Error = 0.0581	Error = 0.1315
	b	3.3370	3.3153	3.3812	3.4049	3.1409	3.2527	3.2795	3.0712
		Error = 0.0255	Error = 0.0164	Error = 0.0431	Error = 0.0226	Error = 0.0248	Error = 0.0171	Error = 0.0167	Error = 0.0382
		R^2 = 0.997	R^2 = 0.999	R^2 = 0.989	R^2 = 0.997	R^2 = 0.996	R^2 = 0.998	R^2 = 0.998	R2 = 0.990
		N = 2446	N = 1513	N = 386	N = 726	N = 573	N = 1087	N = 1587	N = 1226

TABLE 6. American plaice length distribution. Estimated numbers per haul 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.)	1997 Males	Females	Indet.	Total	1998 Males	Females	Indet.	Total	1999 Males	Females	Indet.	Total	2000 Males	Females	Indet.	Total
6	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
8	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
10	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	3.121	3.121	6.241	0.000	0.000	0.000	0.000
12	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	12.482	4.184	16.666	6.134	14.669	0.398	21.200
14	0.012	0.011	0.000	0.023	0.016	0.008	0.000	0.024	0.000	0.251	0.118	0.368	8.779	10.537	0.009	19.325
16	0.028	0.028	0.000	0.056	0.540	0.126	0.000	0.666	0.796	1.824	0.000	2.620	45.346	53.211	0.000	98.557
18	0.377	0.551	0.000	0.928	0.008	0.211	0.000	0.219	1.173	3.033	0.000	4.206	50.909	74.684	0.009	125.602
20	1.005	0.967	0.016	1.989	0.225	0.460	0.000	0.685	0.392	0.063	0.000	0.455	14.562	27.343	0.000	41.905
22	1.895	1.270	0.000	3.164	0.841	0.427	0.000	1.268	0.820	1.424	0.000	2.244	3.282	3.585	0.000	6.867
24	2.368	1.660	0.000	4.029	2.084	1.856	0.000	3.940	1.632	0.855	0.000	2.487	2.141	1.490	0.000	3.630
26	2.809	2.578	0.000	5.388	4.532	4.152	0.000	8.685	6.397	1.588	0.000	7.984	2.210	1.980	0.000	4.190
28	5.208	3.042	0.000	8.250	6.357	5.054	0.000	11.411	15.363	6.551	0.000	21.914	3.847	0.914	0.000	4.761
30	8.279	3.110	0.000	11.390	9.342	6.179	0.000	15.521	23.074	11.158	0.000	34.232	10.885	2.742	0.000	13.626
32	5.077	4.408	0.000	9.485	10.269	7.560	0.000	17.828	26.559	12.081	0.000	38.640	20.000	5.396	0.000	25.396
34	4.155	4.831	0.000	8.986	7.857	12.165	0.000	20.022	18.720	10.794	0.000	29.514	17.492	11.991	0.000	29.483
36	2.738	4.803	0.000	7.542	4.808	16.102	0.000	20.910	11.350	13.455	0.000	24.805	11.212	14.099	0.000	25.311
38	1.084	4.651	0.000	5.735	2.472	17.404	0.000	19.875	5.744	20.888	0.000	26.632	5.881	16.557	0.000	22.438
40	0.708	3.458	0.000	4.166	1.176	13.471	0.000	14.647	2.681	20.487	0.000	23.169	2.928	22.593	0.000	25.521
42	0.207	2.436	0.000	2.643	0.412	10.315	0.000	10.727	1.002	20.272	0.000	21.274	1.063	24.622	0.000	25.685
44	0.173	1.637	0.000	1.810	0.205	7.248	0.000	7.453	0.378	14.039	0.000	14.416	0.476	22.407	0.000	22.883
46	0.126	0.688	0.000	0.814	0.131	4.483	0.000	4.614	0.216	8.589	0.000	8.804	0.328	16.224	0.000	16.552
48	0.014	0.692	0.000	0.706	0.063	3.119	0.000	3.182	0.000	5.641	0.000	5.641	0.289	10.311	0.000	10.600
50	0.004	0.616	0.000	0.620	0.003	1.545	0.000	1.548	0.020	4.476	0.000	4.497	0.054	6.668	0.000	6.722
52	0.000	0.179	0.000	0.179	0.000	0.968	0.000	0.968	0.000	2.715	0.000	2.715	0.155	6.989	0.000	7.144
54	0.000	0.158	0.000	0.158	0.000	0.566	0.000	0.566	0.000	2.367	0.000	2.367	0.000	4.489	0.000	4.489
56	0.000	0.092	0.000	0.092	0.079	0.493	0.000	0.572	0.000	1.718	0.000	1.718	0.000	3.338	0.000	3.338
58	0.000	0.047	0.000	0.047	0.000	0.365	0.000	0.365	0.000	0.728	0.000	0.728	0.000	1.731	0.000	1.731
60	0.000	0.049	0.000	0.049	0.000	0.440	0.000	0.440	0.000	0.483	0.000	0.483	0.000	1.354	0.000	1.354
62	0.000	0.025	0.000	0.025	0.000	0.100	0.000	0.100	0.000	0.315	0.000	0.315	0.000	1.343	0.000	1.343
64	0.000	0.031	0.000	0.031	0.000	0.114	0.000	0.114	0.000	0.260	0.000	0.260	0.000	0.623	0.000	0.623
66	0.000	0.035	0.000	0.035	0.000	0.073	0.000	0.073	0.000	0.076	0.000	0.076	0.000	0.385	0.000	0.385
68	0.000	0.015	0.000	0.015	0.000	0.058	0.000	0.058	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
70	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	0.057	0.000	0.057
72	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	0.018	0.000	0.018
74	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
76	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
78	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.027	0.000	0.027	0.000	0.000	0.000	0.000
Total	36.268	42.067	0.016	78.351	51.420	115.061	0.000	166.481	116.317	181.759	7.422	305.498	207.971	362.348	0.416	570.735

	1997				1998				1999				2000			
Nº samples (*):				116				108				93				96
Nº Ind. (*):	8297	5729	3	14029	4640	7390	0	12030	4541	7742	4	12287	3732	7721	5	11458
Sampled catch:				1390				1617				1858				1697
Range (*):				14-68				13-68				10-77				11-72
Total catch:				4209				8540				10565				15533
Total hauls (*):				128				124				114				118

TABLE 6 (cont.). American plaice length distribution. Estimated numbers per haul 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 Males	Females	Indet.	Total	2002 Males	Females	Indet.	Total	2003 Males	Females	Indet.	Total	2004 Males	Females	Indet.	Total
6	0.000	0.000	0.587	0.587	0.000	0.000	0.000	0.000	0.039	0.000	0.091	0.130	0.000	0.000	0.434	0.434
8	0.010	0.016	2.271	2.297	0.009	0.000	0.058	0.067	0.362	0.103	0.207	0.672	0.449	0.505	41.216	42.170
10	0.145	0.502	0.485	1.132	0.202	0.450	0.000	0.652	0.226	0.184	0.084	0.494	0.585	0.363	45.111	46.060
12	1.107	1.855	0.213	3.175	2.448	5.019	0.161	7.628	0.247	0.405	0.015	0.666	0.113	0.426	1.522	2.060
14	4.379	6.352	0.624	11.355	4.989	6.105	0.039	11.133	1.460	1.536	0.000	2.996	3.088	2.467	0.000	5.555
16	5.347	6.580	0.099	12.026	1.473	1.984	0.000	3.457	2.761	2.134	0.000	4.895	5.989	4.789	0.000	10.778
18	21.846	23.754	0.010	45.610	3.559	4.414	0.000	7.973	12.418	11.632	0.000	24.050	2.205	1.486	0.000	3.691
20	60.932	52.915	0.000	113.847	9.173	9.428	0.000	18.602	12.069	11.293	0.000	23.362	2.110	2.311	0.000	4.421
22	48.112	50.013	0.000	98.125	18.931	13.303	0.000	32.233	7.932	8.590	0.000	16.522	8.991	4.957	0.000	13.948
24	15.533	24.532	0.000	40.065	37.015	32.777	0.000	69.792	21.728	13.110	0.000	34.838	17.563	14.131	0.000	31.694
26	4.035	5.722	0.000	9.757	30.623	41.246	0.000	71.869	52.318	17.071	0.000	69.389	18.867	12.563	0.000	31.430
28	2.780	2.614	0.000	5.394	12.039	23.781	0.000	35.820	54.968	45.335	0.000	100.303	35.069	12.030	0.000	47.099
30	7.486	1.550	0.000	9.036	5.059	8.089	0.000	13.148	26.253	61.926	0.000	88.179	41.635	20.419	0.000	62.054
32	14.373	1.413	0.000	15.786	6.261	2.568	0.000	8.829	10.640	34.653	0.000	45.293	23.691	38.504	0.000	62.195
34	17.325	3.468	0.000	20.793	7.141	1.535	0.000	8.676	10.622	13.152	0.000	23.774	13.174	50.924	0.000	64.098
36	12.482	7.563	0.000	20.045	5.429	1.518	0.000	6.946	8.116	4.437	0.000	12.553	8.308	33.605	0.000	41.913
38	4.780	11.402	0.000	16.182	3.418	2.795	0.000	6.213	5.858	2.367	0.000	8.225	4.238	9.851	0.000	14.088
40	2.146	12.780	0.000	14.926	1.294	6.069	0.000	7.363	2.627	3.704	0.000	6.331	1.693	4.662	0.000	6.355
42	0.945	12.959	0.085	13.988	0.623	7.309	0.000	7.932	0.577	6.256	0.000	6.834	1.105	5.276	0.000	6.381
44	0.602	13.323	0.000	13.925	0.182	7.296	0.000	7.477	0.207	6.518	0.000	6.725	0.230	6.200	0.000	6.430
46	0.137	11.555	0.000	11.692	0.090	6.480	0.000	6.569	0.057	6.639	0.000	6.696	0.088	7.151	0.000	7.239
48	0.000	6.943	0.000	6.943	0.009	4.157	0.000	4.165	0.031	5.863	0.000	5.894	0.065	5.838	0.000	5.903
50	0.000	3.758	0.000	3.758	0.024	3.043	0.000	3.068	0.000	4.056	0.000	4.056	0.000	4.805	0.000	4.805
52	0.000	2.327	0.000	2.327	0.020	1.442	0.000	1.462	0.000	2.860	0.000	2.860	0.010	3.528	0.000	3.539
54	0.000	1.399	0.000	1.399	0.020	1.411	0.000	1.431	0.000	2.743	0.000	2.743	0.000	2.020	0.000	2.020
56	0.016	1.155	0.000	1.171	0.000	0.859	0.000	0.859	0.000	1.454	0.000	1.454	0.000	1.790	0.000	1.790
58	0.000	0.394	0.000	0.394	0.000	0.482	0.000	0.482	0.000	0.998	0.000	0.998	0.103	1.567	0.000	1.671
60	0.000	0.427	0.000	0.427	0.000	0.143	0.000	0.143	0.000	0.470	0.000	0.470	0.000	0.464	0.000	0.464
62	0.000	0.364	0.000	0.364	0.000	0.225	0.000	0.225	0.000	0.150	0.000	0.150	0.000	0.309	0.000	0.309
64	0.000	0.107	0.000	0.107	0.000	0.040	0.000	0.040	0.000	0.108	0.000	0.108	0.000	0.221	0.000	0.221
66	0.000	0.000	0.000	0.000	0.000	0.047	0.000	0.047	0.000	0.131	0.000	0.131	0.000	0.138	0.000	0.138
68	0.000	0.078	0.000	0.078	0.000	0.049	0.000	0.049	0.000	0.000	0.000	0.000	0.000	0.101	0.000	0.101
70	0.000	0.022	0.000	0.022	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	0.000	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
74	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
76	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
78	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	224.517	267.840	4.373	496.730	150.028	194.063	0.259	344.350	231.515	269.878	0.396	501.789	189.372	253.400	88.283	531.055

Nº samples (*):				81				108				91				75
Nº Ind. (*):	4996	7906	114	13016	5873	7234	12	13119	6122	7333	9	13464	5076	7561	1353	13990
Sampled catch:				3388				3675				3885				4614
Range (*):				5-70				7-68				6-66				6-68
Total catch:				11477				9201				13955				13729
Total hauls (*):				83				125				122				122

TABLE 7. Swept area, number of hauls and Yellowtail flounder mean catch (kg) and SD (**) by stratum. Spanish Spring Surveys on NAFO Div. 3NO: 1995-2004. Swept area in square miles. n.s. means stratum not surveyed. 1995-2000 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.

	1995				1996				1997				1998			
Stratum	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD
353	0.0353	3	5.82	4.105	0.0371	3	74.88	94.62	0.0480	4	12.55	14.26	0.0465	4	12.22	20.16
354	0.0353	3	1.78	3.089	0.0319	3	1.11	0.84	0.0233	2	1.41	1.56	0.0356	3	1.22	0.24
355	n.s.	n.s.	n.s.	n.s.	0.0221	2	0.25	0.35	0.0233	2	2.20	0.31	0.0221	2	0.13	0.18
356	n.s.	n.s.	n.s.	n.s.	0.0203	2	0.00	0.00	0.0225	2	0.32	0.46	0.0221	2	0.00	0.00
357	0.0109	1	0.00	-	0.0218	2	0.00	0.00	0.0443	4	0.00	0.00	0.0240	2	0.00	0.00
358	0.0319	3	0.00	0.000	0.0319	3	0.13	0.23	0.0563	5	0.02	0.04	0.0236	3	0.00	0.00
359	0.0345	3	1.35	2.336	0.0548	5	0.92	0.83	0.0690	6	0.08	0.14	0.0698	6	0.17	0.22
360	0.3563	31	20.44	40.707	0.3761	31	142.09	128.86	0.3754	32	80.92	155.59	0.2561	25	373.90	629.84
374	0.0225	2	0.00	0.000	0.0233	2	0.00	0.00	0.0353	3	0.00	0.00	0.0353	3	0.04	0.02
375	0.0225	2	1.48	1.875	0.0229	2	41.40	58.54	0.0116	1	0.20	-	0.0345	3	12.37	21.37
376	0.1729	15	35.06	58.691	0.1650	14	71.40	86.94	0.1583	14	162.35	179.83	0.0930	10	279.27	181.29
377	0.0221	2	0.00	0.000	0.0229	2	0.00	0.00	0.0116	1	0.00	-	0.0229	2	0.00	0.00
378	0.0435	4	0.00	0.000	0.0330	3	0.06	0.10	0.0210	2	0.00	0.00	0.0120	2	0.00	0.00
379	0.0221	2	0.00	0.000	0.0113	1	0.00	-	0.0206	2	0.00	0.00	0.0356	3	0.00	0.00
380	n.s.	n.s.	n.s.	n.s.	0.0221	2	0.00	0.00	0.0210	2	0.00	0.00	0.0113	2	0.00	0.00
381	n.s.	n.s.	n.s.	n.s.	0.0229	2	0.00	0.00	0.0221	2	0.00	0.00	0.0229	2	0.00	0.00
382	n.s.	n.s.	n.s.	n.s.	0.0338	3	0.00	0.00	0.0461	4	0.00	0.00	0.0229	3	0.00	0.00
721	n.s.	n.s.	n.s.	n.s.	0.0214	2	0.03	0.05	0.0221	2	0.75	1.06	0.0203	2	0.00	0.00
722	n.s.	n.s.	n.s.	n.s.	0.0206	2	0.00	0.00	0.0214	2	0.00	0.00	0.0101	2	0.00	0.00
723	n.s.	n.s.	n.s.	n.s.	0.0109	1	0.00	-	0.0210	2	0.00	0.00	0.0233	2	0.00	0.00
724	0.0105	1	0.00	-	0.0203	2	0.00	0.00	0.0225	2	0.00	0.00	0.0206	2	0.00	0.00
725	0.0334	3	0.00	0.000	0.0225	2	0.00	0.00	0.0206	2	0.00	0.00	0.0086	1	0.00	-
726	0.0214	2	0.00	0.000	0.0218	2	0.00	0.00	n.s.	n.s.	n.s.	n.s.	0.0094	2	0.00	0.00
727	n.s.	n.s.	n.s.	n.s.	0.0210	2	0.00	0.00	0.0094	1	0.00	-	0.0233	2	0.00	0.00
728	n.s.	n.s.	n.s.	n.s.	0.0218	2	0.00	0.00	0.0214	2	0.00	0.00	0.0206	2	0.00	0.00
752	n.s.	n.s.	n.s.	n.s.	0.0109	1	0.00	-	0.0218	2	0.00	0.00	0.0229	2	0.00	0.00
753	n.s.	n.s.	n.s.	n.s.	0.0199	2	0.00	0.00	0.0214	2	0.00	0.00	0.0218	2	0.00	0.00
754	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0330	3	0.00	0.00	0.0210	2	0.00	0.00
755	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0206	2	0.00	0.00
756	n.s.	n.s.	n.s.	n.s.	0.0210	2	0.00	0.00	0.0109	1	0.00	-	0.0225	2	0.00	0.00
757	n.s.	n.s.	n.s.	n.s.	0.0188	2	0.00	0.00	0.0304	3	0.00	0.00	0.0206	2	0.00	0.00
758	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0214	2	0.00	0.00	0.0105	2	0.00	0.00
759	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0214	2	0.00	0.00
760	n.s.	n.s.	n.s.	n.s.	0.0210	2	0.00	0.00	0.0105	1	0.00	-	0.0214	2	0.00	0.00
761	n.s.	n.s.	n.s.	n.s.	0.0199	2	0.00	0.00	0.0315	3	0.00	0.00	0.0206	2	0.00	0.00
762	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0308	3	0.00	0.00	0.0094	2	0.00	0.00
763	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0218	2	0.00	0.00
764	n.s.	n.s.	n.s.	n.s.	0.0210	2	0.00	0.00	0.0206	2	0.00	0.00	0.0218	2	0.00	0.00
765	n.s.	n.s.	n.s.	n.s.	0.0199	2	0.00	0.00	0.0206	2	0.00	0.00	0.0098	2	0.00	0.00
766	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0308	3	0.00	0.00	0.0191	2	0.00	0.00
767	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0109	2	0.00	0.00

$$(**)\,SD = \frac{\sum\left(x_i - \bar{x}\right)^2}{n-1}$$

TABLE 7 (cont.).- Swept area, number of hauls and Yellowtail flounder mean catch (kg) and SD (**) by stratum. Spanish Spring Surveys on NAFO Div. 3NO: 1995-2004. Swept area in square miles. n.s. means stratum not surveyed. 1995-2000 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.

	1999				2000				2001			
Stratum	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD
353	0.0360	3	150.18	182.44	0.0356	3	67.87	91.37	0.0341	3	61.42	102.797
354	0.0218	2	0.08	0.12	0.0356	3	1.79	1.93	0.0338	3	0.34	0.322
355	0.0229	2	0.00	0.00	0.0233	2	0.00	0.00	0.0240	2	0.00	0.000
356	0.0229	2	0.00	0.00	0.0225	2	0.00	0.00	0.0240	2	0.01	0.007
357	0.0236	2	0.00	0.00	0.0124	1	0.00	-	0.0244	2	0.00	0.000
358	0.0349	3	0.00	0.00	0.0341	3	0.00	0.00	0.0345	3	0.00	0.000
359	0.0364	3	0.34	0.47	0.0469	4	2.36	2.93	0.0803	7	1.42	2.836
360	0.2325	19	545.18	424.37	0.2396	20	391.18	331.64	0.2423	20	536.80	488.657
374	0.0244	2	74.16	103.18	0.0240	2	20.47	23.55	0.0240	2	238.75	111.369
375	0.0236	2	347.15	168.25	0.0244	2	153.36	2.06	0.0338	3	100.33	68.319
376	0.1219	10	551.60	165.61	0.1200	10	435.27	236.60	0.1155	10	443.12	196.619
377	0.0240	2	0.00	0.00	0.0229	2	0.05	0.06	0.0229	2	0.00	0.000
378	0.0229	2	0.00	0.00	0.0233	2	0.00	0.00	0.0236	2	0.00	0.000
379	0.0236	2	0.00	0.00	0.0225	2	0.00	0.00	0.0229	2	0.00	0.000
380	0.0236	2	0.00	0.00	0.0236	2	0.00	0.00	0.0206	2	0.00	0.000
381	0.0229	2	0.00	0.00	0.0236	2	0.00	0.00	0.0236	2	0.00	0.000
382	0.0484	4	0.00	0.00	0.0499	4	0.00	0.00	0.0469	4	0.02	0.030
721	0.0244	2	0.00	0.00	0.0236	2	0.00	0.00	0.0248	2	0.00	0.000
722	0.0229	2	0.00	0.00	0.0218	2	0.00	0.00	0.0233	2	0.00	0.000
723	0.0229	2	0.00	0.00	0.0248	2	0.00	0.00	0.0240	2	0.00	0.000
724	0.0225	2	0.00	0.00	0.0233	2	0.00	0.00	0.0353	3	0.00	0.000
725	0.0229	2	0.00	0.00	0.0210	2	0.00	0.00	0.0116	2	0.00	0.000
726	0.0225	2	0.00	0.00	0.0221	2	0.00	0.00	0.0116	2	0.00	0.000
727	0.0236	2	0.00	0.00	0.0210	2	0.00	0.00	0.0225	2	0.00	0.000
728	0.0233	2	0.00	0.00	0.0210	2	0.00	0.00	0.0229	2	0.00	0.000
752	0.0233	2	0.00	0.00	0.0206	2	0.00	0.00	0.0210	2	0.06	0.083
753	0.0229	2	0.00	0.00	0.0218	2	0.00	0.00	0.0214	2	0.00	0.000
754	0.0206	2	0.00	0.00	0.0195	2	0.00	0.00	0.0195	2	0.00	0.000
755	0.0311	3	0.00	0.00	0.0431	4	0.00	0.00	0.0416	4	0.00	0.000
756	0.0225	2	0.00	0.00	0.0203	2	0.00	0.00	0.0113	2	0.00	0.000
757	0.0233	2	0.00	0.00	0.0214	2	0.00	0.00	0.0233	2	0.00	0.000
758	0.0214	2	0.00	0.00	0.0210	2	0.00	0.00	0.0218	2	0.00	0.000
759	0.0218	2	0.00	0.00	0.0210	2	0.00	0.00	0.0221	2	0.00	0.000
760	0.0225	2	0.00	0.00	0.0210	2	0.00	0.00	0.0229	2	0.00	0.000
761	0.0210	2	0.00	0.00	0.0221	2	0.00	0.00	0.0225	2	0.00	0.000
762	0.0210	2	0.00	0.00	0.0203	2	0.00	0.00	0.0116	2	0.00	0.000
763	0.0311	3	0.00	0.00	0.0416	4	0.00	0.00	0.0330	3	0.00	0.000
764	0.0225	2	0.00	0.00	0.0218	2	0.00	0.00	0.0240	2	0.00	0.000
765	0.0221	2	0.00	0.00	0.0203	2	0.00	0.00	0.0113	2	0.00	0.000
766	0.0218	2	0.00	0.00	0.0214	2	0.00	0.00	0.0203	2	0.00	0.000
767	0.0214	2	0.00	0.00	0.0210	2	0.00	0.00	0.0218	2	0.00	0.000

$$(**) \; SD = \frac{\sum (x_i - \bar{x})^2}{n-1}$$

TABLE 7 (cont.).- Swept area, number of hauls and Yellowtail flounder mean catch (kg) and SD (**) by stratum. Spanish Spring Surveys on NAFO Div. 3NO: 1995-2004. Swept area in square miles. n.s. means stratum not surveyed. 1995-2000 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.

	2002				2003				2004			
Stratum	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD	Swept area	Tow number	Y. flounder Mean catch	Y. flounder SD
353	0.0476	4	75.13	88.259	0.0334	3	11.15	19.307	0.033750	3	8.79	14.005
354	0.0356	3	0.17	0.289	0.0338	3	0.00	0.000	0.034500	3	0.62	1.065
355	0.0236	2	0.00	0.000	0.0229	2	0.00	0.000	0.022875	2	0.00	0.000
356	0.0233	2	0.00	0.000	0.0225	2	0.00	0.000	0.022125	2	0.00	0.000
357	0.0240	2	0.00	0.000	0.0229	2	0.00	0.000	0.022875	2	0.00	0.000
358	0.0345	3	0.00	0.000	0.0338	3	0.00	0.000	0.033000	3	0.26	0.442
359	0.0686	6	0.11	0.261	0.0791	7	0.00	0.000	0.079125	7	25.01	38.371
360	0.2865	25	340.23	356.687	0.2254	20	360.55	298.992	0.231000	20	403.19	333.463
374	0.0345	3	32.04	52.542	0.0225	2	16.13	8.238	0.023250	2	193.46	225.058
375	0.0353	3	48.61	68.927	0.0330	3	28.45	35.557	0.033750	3	543.04	155.015
376	0.1140	10	533.62	416.745	0.1125	10	391.60	257.289	0.116625	10	481.06	140.810
377	0.0229	2	0.00	0.000	0.0225	2	0.70	0.990	0.021750	2	0.00	0.000
378	0.0233	2	0.00	0.000	0.0225	2	0.00	0.000	0.022500	2	0.00	0.000
379	0.0229	2	0.00	0.000	0.0229	2	0.00	0.000	0.012375	1	0.00	-
380	0.0225	2	0.00	0.000	0.0229	2	0.00	0.000	0.022125	2	0.00	0.000
381	0.0229	2	0.00	0.000	0.0229	2	0.00	0.000	0.022500	2	0.00	0.000
382	0.0341	3	0.00	0.000	0.0454	4	0.00	0.000	0.046125	4	0.00	0.000
721	0.0233	2	0.00	0.000	0.0225	2	0.00	0.000	0.022125	2	0.00	0.000
722	0.0236	2	0.00	0.000	0.0221	2	0.00	0.000	0.021750	2	0.00	0.000
723	0.0233	2	0.00	0.000	0.0229	2	0.00	0.000	0.022875	2	0.00	0.000
724	0.0225	2	0.00	0.000	0.0225	2	0.52	0.735	0.021375	2	0.00	0.000
725	0.0225	2	0.00	0.000	0.0229	2	0.00	0.000	0.022500	2	0.00	0.000
726	0.0214	2	0.00	0.000	0.0225	2	0.00	0.000	0.022500	2	0.00	0.000
727	0.0233	2	0.00	0.000	0.0218	2	0.00	0.000	0.023250	2	0.00	0.000
728	0.0229	2	0.00	0.000	0.0225	2	0.00	0.000	0.018000	2	0.00	0.000
752	0.0116	1	0.00	-	0.0229	2	0.00	0.000	0.021375	2	0.00	0.000
753	0.0229	2	0.00	0.000	0.0229	2	0.00	0.000	0.021750	2	0.00	0.000
754	0.0341	3	0.00	0.000	0.0218	2	0.00	0.000	0.021375	2	0.00	0.000
755	0.0338	3	0.00	0.000	0.0221	2	0.00	0.000	0.031875	3	0.00	0.000
756	0.0229	2	0.00	0.000	0.0221	2	0.00	0.000	0.021750	2	0.00	0.000
757	0.0225	2	0.00	0.000	0.0221	2	0.00	0.000	0.021750	2	0.00	0.000
758	0.0225	2	0.00	0.000	0.0221	2	0.00	0.000	0.021375	2	0.00	0.000
759	0.0225	2	0.00	0.000	0.0113	1	0.00	-	0.021375	2	0.00	0.000
760	0.0229	2	0.00	0.000	0.0218	2	0.00	0.000	0.022125	2	0.00	0.000
761	0.0225	2	0.00	0.000	0.0225	2	0.00	0.000	0.022125	2	0.00	0.000
762	0.0225	2	0.00	0.000	0.0225	2	0.00	0.000	0.023250	2	0.00	0.000
763	0.0225	2	0.00	0.000	0.0311	3	0.00	0.000	0.032625	3	0.00	0.000
764	0.0236	2	0.00	0.000	0.0221	2	0.00	0.000	0.022875	2	0.00	0.000
765	0.0236	2	0.00	0.000	0.0113	1	0.00	-	0.022500	2	0.00	0.000
766	0.0233	2	0.00	0.000	0.0225	2	0.00	0.000	0.022500	2	0.00	0.000
767	0.0225	2	0.00	0.000	0.0229	2	0.00	0.000	0.021750	2	0.00	0.000

$$(**) SD = \frac{\sum (x_i - \overline{x})^2}{n-1}$$

TABLE 8. Stratified mean catches (Kg) by stratum and year and SD by year of Yellowtail flounder (1995-2004). n.s. means stratum not surveyed. 1995-2000 data are transformed C/V *Playa de Menduíña* data. 2002-2004 data are original from R/V *Vizconde de Eza.* In 2001,there are data from the two vessels.

Stratum	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
353	1565.07	20142.03	3376.59	3288.11	40399.20	18255.85	16521.08	20208.63	2998.45	2364.96
354	438.70	0.00	346.30	299.00	20.56	439.52	83.64	41.00	0.00	151.29
355	n.s.	0.00	163.06	9.34	0.00	0.00	0.00	0.00	0.00	0.00
356	n.s.	0.00	15.24	0.00	0.00	0.00	0.24	0.00	0.00	0.00
357	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
358	0.00	30.09	4.21	0.00	0.00	0.00	0.00	0.00	0.00	57.45
359	567.78	385.71	34.00	72.73	143.12	994.90	597.82	44.91	0.00	10527.59
360	56884.98	395448.50	225203.35	1040562.34	1517232.56	1088647.76	1493908.83	946847.84	1003413.43	1122077.77
374	0.00	0.00	0.00	9.54	15871.12	4379.59	51092.50	6856.85	3450.75	41400.44
375	401.88	11218.18	54.37	3352.77	94076.82	41560.71	27190.33	13173.31	7709.95	147164.74
376	46774.78	95247.02	216576.13	372549.36	735836.39	580653.95	591126.08	711849.08	522389.06	641736.71
377	0.00	0.00	0.00	0.00	0.00	4.51	0.00	0.00	70.00	0.00
378	0.00	7.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
379	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
380	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
381	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
382	n.s.	0.00	0.00	0.00	0.00	0.00	5.16	0.00	0.00	0.00
721	n.s.	2.17	48.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
722	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
723	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
724	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	64.48	0.00
725	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
726	0.00	0.00	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
727	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
728	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
752	n.s.	0.00	0.00	0.00	0.00	0.00	7.67	0.00	0.00	0.00
753	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
754	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
755	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
756	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
757	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
758	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
759	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
760	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
761	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
762	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
763	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
764	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
765	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
766	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
767	n.s.	n.s.	n.s.	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	106633.19	522481.47	445822.16	1420143.19	2403579.77	1734936.80	2180533.35	1699021.61	1540096.13	1965480.95
$\left(\overline{Y}\right)$	16.22	59.54	47.74	137.32	232.41	167.76	210.84	164.28	148.92	190.05
S.D.	4.37	8.41	10.69	34.70	27.41	22.21	30.58	24.92	20.84	21.27

TABLE 9. Survey estimates (by the swept area method) of Yellowtail flounder biomass (t) and SD by stratum and year on NAFO Div. 3NO. n.s. means stratum not surveyed. 1995-2000 data are transformed C/V *Playa de Menduíña* data. 2002-2004 data are original from R/V *Vizconde de Eza.* In 2001, there are data from the two vessels.

Stratum	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
353	133	1628	281	282	3367	1537	1452	1697	270	210
354	37	26	30	25	2	37	7	3	0	13
355	n.s.	2	14	0	0	0	0	0	0	0
356	n.s.	0	1	0	0	0	0	0	0	0
357	0	0	0	0	0	0	0	0	0	0
358	0	3	0	0	0	0	0	0	0	5
359	49	35	3	6	12	85	52	4	0	931
360	4950	32593	19198	89742	123989	90863	123341	82622	89057	97150
374	0	0	0	0	1302	365	4258	596	307	3561
375	36	981	5	291	7964	3410	2417	1121	701	13081
376	4059	8082	19160	32255	60376	48388	51175	62443	46435	55026
377	0	0	0	0	0	0	0	0	6	0
378	0	1	0	0	0	0	0	0	0	0
379	0	0	0	0	0	0	0	0	0	0
380	n.s.	0	0	0	0	0	0	0	0	0
381	n.s.	0	0	0	0	0	0	0	0	0
382	n.s.	0	0	0	0	0	0	0	0	0
721	n.s.	0	4	0	0	0	0	0	0	0
722	n.s.	0	0	0	0	0	0	0	0	0
723	n.s.	0	0	0	0	0	0	0	0	0
724	0	0	0	0	0	0	0	0	0	0
725	0	0	0	0	0	0	0	0	0	0
726	0	0	n.s.	0	0	0	0	0	0	0
727	n.s.	0	0	0	0	0	0	0	0	0
728	n.s.	0	0	0	0	0	0	0	0	0
752	n.s.	0	0	0	0	0	1	0	0	0
753	n.s.	0	0	0	0	0	0	0	0	0
754	n.s.	n.s.	0	0	0	0	0	0	0	0
755	n.s.	n.s.	n.s.	0	0	0	0	0	0	0
756	n.s.	0	0	0	0	0	0	0	0	0
757	n.s.	0	0	0	0	0	0	0	0	0
758	n.s.	n.s.	0	0	0	0	0	0	0	0
759	n.s.	n.s.	n.s.	0	0	0	0	0	0	0
760	n.s.	0	0	0	0	0	0	0	0	0
761	n.s.	0	0	0	0	0	0	0	0	0
762	n.s.	n.s.	0	0	0	0	0	0	0	0
763	n.s.	n.s.	n.s.	0	0	0	0	0	0	0
764	n.s.	0	0	0	0	0	0	0	0	0
765	n.s.	0	0	0	0	0	0	0	0	0
766	n.s.	n.s.	0	0	0	0	0	0	0	0
767	n.s.	n.s.	n.s.	0	0	0	0	0	0	0
TOTAL	9264	43349	38697	122601	197012	144685	182704	148487	136775	169978
S.D.	2484	6032	8527	31359	22938	19097	25847	23368	19287	18869

TABLE 10. Length weight relationships in the calculation of Yellowtail flounder biomass. The equation is $Weight = a(l+0.5)^b$
Spanish Spring Surveys on NAFO Div. 3NO: 1995-2004. To calculate the parameters for the indeterminate individuals, we used the total data (males + females + indeterminate individuals)

		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004
Males	a	0.0079	0.0080	0.0081	0.0075	0.0084	0.0036	0.0081	0.0075	0.0121	0.0053
		Error = 0.2653	Error = 0.0907	Error = 0.0936	Error = 0.1034	Error = 0.2119	Error = 0.0994	Error = 0.1248	Error = 0.0729	Error = 0.1109	Error = 0.1352
	b	3.0416	3.0342	3.0197	3.0376	3.0098	3.2403	3.0176	3.0271	2.8978	3.1236
		Error = 0.0799	Error = 0.0269	Error = 0.0281	Error = 0.0313	Error = 0.0610	Error = 0.0300	Error = 0.0374	Error = 0.0226	Error = 0.0348	Error = 0.0419
		R2 = 0.984	R2 = 0.998	R2 = 0.997	R2 = 0.997	R2 = 0.994	R2 = 0.997	R2 = 0.995	R2 = 0.998	R2 = 0.995	R2 = 0.995
		0.0063	0.0056	0.0056	0.0067	0.0073	0.0026	0.0060	0.0051	0.0061	0.0047
Females	a	Error = 0.1251	Error = 0.0632	Error = 0.0517	Error = 0.1290	Error = 0.2607	Error = 0.0914	Error = 0.0841	Error = 0.0901	Error = 0.0995	Error = 0.0630
		3.1083	3.1496	3.1382	3.0788	3.0577	3.3504	3.1122	3.1448	3.1079	3.1768
	b	Error = 0.0367	Error = 0.0179	Error = 0.0152	Error = 0.0384	Error = 0.0739	Error = 0.0267	Error = 0.0249	Error = 0.0274	Error = 0.0307	Error = 0.0191
		R2 = 0.995	R2 = 0.999	R2 = 0.999	R2 = 0.994	R2 = 0.989	R2 = 0.998	R2 = 0.997	R2 = 0.997	R2 = 0.996	R2 = 0.999
		0.0088	0.0060	0.0060	0.0071	0.0078	0.0026	0.0092	0.0060	0.0069	0.0040
		Error = 0.1109	Error = 0.0656	Error = 0.0580	Error = 0.0652	Error = 0.1656	Error = 0.0835	Error = 0.1075	Error = 0.0402	Error = 0.1095	Error = 0.0608
Indet.	a	3.0144	3.1285	3.1166	3.0614	3.0406	3.3423	2.9883	3.0977	3.0737	3.2137
		Error = 0.0330	Error = 0.0188	Error = 0.0171	Error = 0.0195	Error = 0.0477	Error = 0.0245	Error = 0.0329	Error = 0.0123	Error = 0.0337	Error = 0.0186
	b	R2 = 0.996	R2 = 0.999	R2 = 0.999	R2 = 0.994	R2 = 0.995	R2 = 0.999	R2 = 0.994	R2 = 0.999	R2 = 0.995	R2 = 0.999
		0.0079	0.0080	0.0081	0.0075	0.0084	0.0036	0.0081	0.0075	0.0121	0.0053
		Error = 0.2653	Error = 0.0907	Error = 0.0936	Error = 0.1034	Error = 0.2119	Error = 0.0994	Error = 0.1248	Error = 0.0729	Error = 0.1109	Error = 0.1352
		3.0416	3.0342	3.0197	3.0376	3.0098	3.2403	3.0176	3.0271	2.8978	3.1236

TABLE 11. Yellowtail flounder length distribution. Estimated numbers per haul mean catches. Spanish Spring Survey on NAFO 3NO: 1995-2004. Indet. means indeterminate. 1995-2000 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.

Lenght (cm.)	1995				1996				1997				1998			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
6	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
8	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
10	0.000	0.000	0.344	0.344	0.000	0.000	0.034	0.034	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
12	0.000	0.000	0.767	0.767	0.000	0.000	0.786	0.786	0.162	0.162	0.000	0.324	0.000	0.000	1.865	1.865
14	0.868	1.924	4.447	7.239	0.000	0.000	1.992	1.992	1.273	1.043	0.000	2.315	0.000	0.000	0.000	0.000
16	1.572	1.848	0.758	4.178	0.133	0.392	3.113	3.638	1.216	1.070	0.000	2.286	0.439	0.781	0.000	1.220
18	2.758	4.369	0.181	7.309	1.010	9.917	5.960	16.887	3.735	2.048	0.000	5.783	3.952	2.778	0.000	6.730
20	3.431	4.165	0.000	7.595	5.426	29.273	1.535	36.234	11.547	13.287	0.000	24.833	13.419	9.951	0.000	23.371
22	4.805	4.777	0.000	9.582	7.917	35.916	0.267	44.100	25.748	20.560	0.000	46.308	17.107	15.776	0.000	32.883
24	5.797	7.335	0.000	13.132	10.935	34.768	0.000	45.703	31.889	29.083	0.000	60.972	33.992	28.582	0.000	62.574
26	3.380	4.444	0.000	7.824	9.975	25.176	0.000	35.151	26.987	27.535	0.000	54.523	63.854	49.768	0.000	113.622
28	2.247	1.997	0.000	4.244	8.816	11.362	0.000	20.179	19.211	23.856	0.000	43.067	66.408	66.992	0.000	133.400
30	2.452	3.529	0.000	5.980	7.805	10.967	0.000	18.772	8.741	14.729	0.000	23.470	46.700	60.152	0.000	106.852
32	2.014	4.434	0.000	6.448	5.810	7.357	0.000	13.167	4.012	6.281	0.000	10.293	22.497	41.280	0.000	63.777
34	1.562	3.760	0.000	5.322	6.462	5.463	0.000	11.925	2.762	3.663	0.000	6.425	7.405	26.359	0.000	33.765
36	0.858	2.072	0.000	2.930	4.610	8.343	0.000	12.953	1.335	2.676	0.000	4.011	4.370	17.068	0.000	21.438
38	0.488	1.373	0.000	1.861	2.597	7.897	0.000	10.494	0.828	2.195	0.000	3.023	2.732	9.148	0.000	11.880
40	0.494	1.182	0.000	1.675	1.483	5.321	0.000	6.804	0.347	2.176	0.000	2.523	1.193	7.879	0.000	9.071
42	0.157	0.809	0.000	0.966	0.448	4.019	0.000	4.467	0.103	1.210	0.000	1.313	0.714	4.734	0.000	5.448
44	0.010	0.517	0.000	0.527	0.495	2.187	0.000	2.682	0.077	0.585	0.000	0.662	0.070	2.521	0.000	2.592
46	0.009	0.212	0.000	0.220	0.109	1.505	0.000	1.614	0.005	0.167	0.000	0.172	0.005	0.750	0.000	0.755
48	0.000	0.189	0.000	0.189	0.034	0.434	0.000	0.467	0.000	0.042	0.000	0.042	0.007	0.850	0.000	0.857
50	0.000	0.141	0.000	0.141	0.000	0.299	0.000	0.299	0.000	0.088	0.000	0.088	0.000	0.171	0.000	0.171
52	0.000	0.060	0.000	0.060	0.000	0.076	0.000	0.076	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
54	0.000	0.023	0.000	0.023	0.000	0.000	0.000	0.000	0.000	0.024	0.000	0.024	0.000	0.000	0.000	0.000
56	0.000	0.006	0.000	0.006	0.000	0.046	0.000	0.046	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Total	32.900	49.165	6.497	88.562	74.067	200.716	13.687	288.470	139.978	152.479	0.000	292.457	284.865	345.542	1.865	632.271
Nº samples (*):				43				33				54				48
Nº Ind. (*):	1876	3003	81	4960	1837	4584	249	6670	3635	4469	0	8104	2848	3693	3	6544
Sampled catch:				375				532				585				536
Range (*):				9-56				10-55				12-53				11-49
Total catch:				2731				5721				4956				12231
Total hauls (*):				77				112				128				124

TABLE 11 (cont.). Yellowtail flounder length distribution. Estimated numbers per haul mean catches. Spanish Spring Survey on NAFO 3NO: 1995-2004. Indet. means indeterminate. 1995-2000 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.)	1999				2000				2001			
	Males	Females	Indet.	Total	Males	Females	Indet.	Total	Males	Females	Indet.	Total
6	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.104	0.104
8	0.000	0.000	0.912	0.912	0.000	0.000	0.000	0.000	0.000	0.000	0.761	0.761
10	0.766	0.766	2.425	3.957	0.000	0.000	0.000	0.000	0.000	0.092	2.356	2.448
12	13.222	5.430	1.825	20.477	1.145	0.862	0.000	2.006	0.101	0.948	1.592	2.641
14	20.744	21.373	0.000	42.117	6.516	9.554	0.000	16.070	0.603	1.389	1.329	3.321
16	12.145	10.531	0.000	22.676	7.944	8.578	0.000	16.523	1.776	2.697	0.155	4.628
18	13.611	16.667	0.000	30.278	15.711	15.254	0.000	30.965	5.920	6.170	0.494	12.584
20	12.714	11.984	0.000	24.698	18.617	22.233	0.000	40.851	14.981	15.262	0.059	30.301
22	32.525	19.533	0.000	52.057	21.574	28.837	0.000	50.411	19.742	29.846	0.000	49.588
24	47.478	33.660	0.000	81.138	20.500	20.599	0.000	41.099	21.741	26.088	0.000	47.829
26	82.720	48.878	0.000	131.598	34.587	27.685	0.000	62.272	23.504	23.164	0.000	46.669
28	112.776	77.006	0.000	189.782	59.826	35.620	0.000	95.446	43.539	28.098	0.000	71.637
30	89.768	83.953	0.000	173.721	69.628	38.600	0.000	108.228	66.237	37.481	0.000	103.718
32	45.422	85.876	0.000	131.298	46.623	50.547	0.000	97.170	67.249	52.566	0.000	119.815
34	19.217	55.447	0.000	74.664	22.918	46.826	0.000	69.745	33.030	66.512	0.000	99.542
36	12.236	30.651	0.000	42.887	7.667	30.938	0.000	38.605	12.986	55.405	0.000	68.391
38	6.160	19.551	0.000	25.711	4.512	20.194	0.000	24.706	5.871	40.040	0.000	45.911
40	2.133	10.841	0.000	12.973	2.845	12.192	0.000	15.038	5.371	18.526	0.000	23.898
42	0.627	7.821	0.000	8.448	0.848	8.968	0.000	9.815	1.335	10.628	0.000	11.963
44	0.378	3.786	0.000	4.164	0.139	5.900	0.000	6.038	0.683	5.769	0.000	6.453
46	0.040	1.567	0.000	1.607	0.005	2.927	0.000	2.932	0.282	2.860	0.000	3.143
48	0.130	1.207	0.000	1.337	0.007	1.422	0.000	1.428	0.092	1.601	0.000	1.692
50	0.000	0.504	0.000	0.504	0.000	0.668	0.000	0.668	0.000	0.370	0.000	0.370
52	0.000	0.054	0.000	0.054	0.000	0.223	0.000	0.223	0.000	0.078	0.000	0.078
54	0.000	0.000	0.000	0.000	0.000	0.041	0.000	0.041	0.000	0.051	0.000	0.051
56	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	524.810	547.084	5.163	1077.057	341.611	388.669	0.000	730.280	325.042	425.642	6.850	757.533
Nº samples (*):				39				42				43
Nº Ind. (*):	4616	5076	6	9698	3323	4100	0	7423	3358	4684	80	8122
Sampled catch:				796				717				2298
Range (*):				8-52				11-54				6-53
Total catch:				17169				12742				16141
Total hauls (*):				114				118				83

TABLE 11 (cont.).- Yellowtail flounder length distribution. Estimated numbers per haul mean catches. Spanish Spring Survey on NAFO 3NO: 1995-2004. Indet. means indeterminate. 1995-2000 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.)	2002 Males	Females	Indet.	Total	2003 Males	Females	Indet.	Total	2004 Males	Females	Indet.	Total
6	0.000	0.000	0.117	0.117	0.000	0.000	0.013	0.013	0.000	0.000	0.171	0.171
8	0.125	0.374	0.478	0.977	0.013	0.109	0.585	0.707	0.056	0.048	0.669	0.774
10	0.805	0.534	0.117	1.456	0.238	0.388	0.140	0.765	0.262	0.249	0.301	0.812
12	1.193	0.927	0.000	2.120	1.030	1.093	0.000	2.123	1.415	1.135	0.000	2.549
14	0.166	0.292	0.000	0.458	1.048	1.130	0.000	2.179	2.821	2.159	0.000	4.980
16	1.829	2.028	0.000	3.857	1.191	0.502	0.000	1.693	4.031	2.635	0.000	6.666
18	2.613	1.804	0.000	4.417	1.026	0.784	0.000	1.810	3.736	3.739	0.000	7.475
20	4.357	3.755	0.000	8.112	1.356	1.738	0.000	3.094	6.146	5.039	0.000	11.186
22	11.460	8.693	0.000	20.153	2.943	3.310	0.000	6.253	4.204	5.890	0.000	10.094
24	17.665	15.073	0.000	32.738	7.750	6.354	0.000	14.103	6.017	5.731	0.000	11.747
26	24.043	23.040	0.000	47.083	19.031	14.119	0.000	33.150	13.672	10.420	0.000	24.092
28	30.701	23.693	0.000	54.394	34.511	25.899	0.000	60.410	38.405	19.150	0.000	57.555
30	48.648	24.893	0.000	73.541	44.227	29.297	0.000	73.524	72.551	41.934	0.000	114.485
32	56.627	41.991	0.000	98.618	52.225	31.886	0.000	84.111	86.611	57.415	0.000	144.026
34	34.117	56.543	0.000	90.660	31.224	47.218	0.000	78.442	50.100	57.476	0.000	107.576
36	10.405	53.023	0.000	63.427	12.035	51.953	0.000	63.987	16.044	55.622	0.000	71.666
38	3.863	34.435	0.000	38.297	4.106	28.999	0.000	33.106	4.779	37.511	0.000	42.290
40	2.386	20.105	0.000	22.491	1.137	15.714	0.000	16.851	2.247	18.502	0.000	20.749
42	0.957	8.182	0.000	9.139	0.416	5.794	0.000	6.210	1.039	7.860	0.000	8.899
44	0.233	5.213	0.000	5.447	0.283	2.994	0.000	3.276	0.082	2.498	0.000	2.580
46	0.000	2.009	0.000	2.009	0.128	1.976	0.000	2.104	0.026	1.244	0.000	1.270
48	0.021	0.852	0.000	0.873	0.000	0.603	0.000	0.603	0.000	0.540	0.000	0.540
50	0.018	0.502	0.000	0.520	0.000	0.269	0.000	0.269	0.000	0.111	0.000	0.111
52	0.018	0.041	0.000	0.059	0.000	0.065	0.000	0.065	0.000	0.000	0.000	0.000
54	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.054	0.000	0.054
56	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	252.249	328.003	0.712	580.964	215.918	272.193	0.738	488.849	314.243	336.963	1.141	652.348
Nº samples (*):				43				37				45
Nº Ind. (*):	3419	4576	7	8002	2424	3254	12	5690	3703	4234	16	7953
Sampled catch:				2269				1864				2587
Range (*):				6-52				5-52				5-53
Total catch:				14385				11280				15117
Total hauls (*):				125				122				122
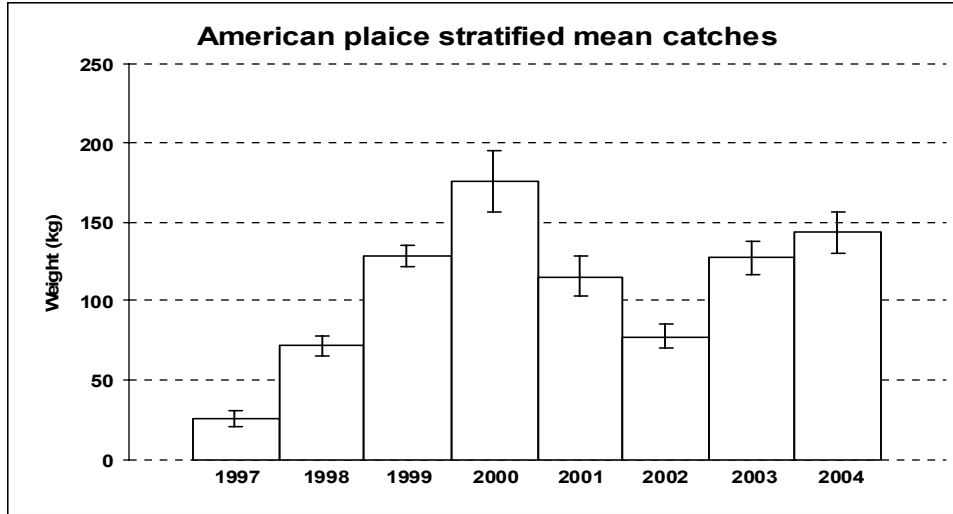
Fig. 1. American plaice stratified mean catches in Kg and ±SD by year. Spanish Spring surveys on NAFO Div. 3NO: 1997-2004 (1997-2000 transformed data from C/V *Playa de Menduíña*; 2002-2004 original data from R/V *Vizconde de Eza*. In 2001, there are data from the two vessels).
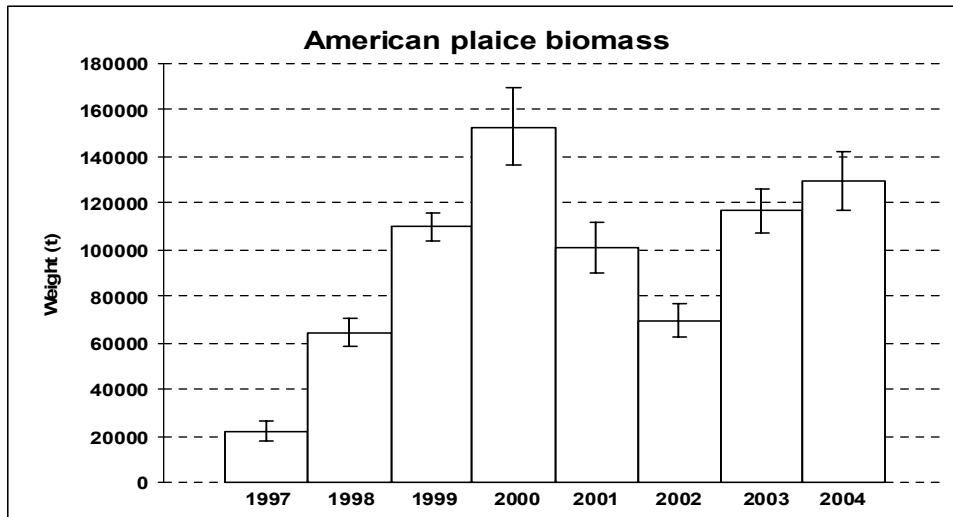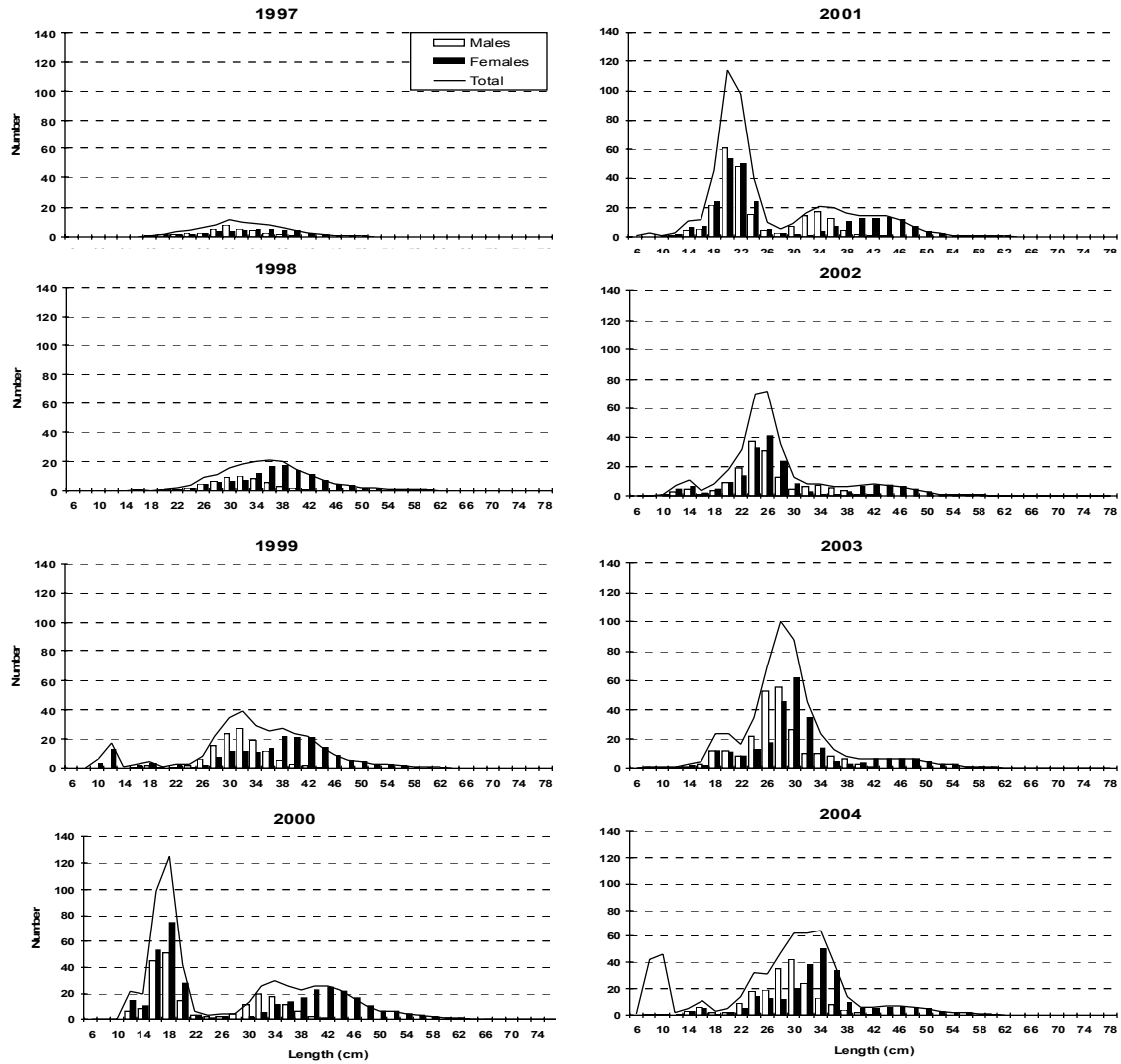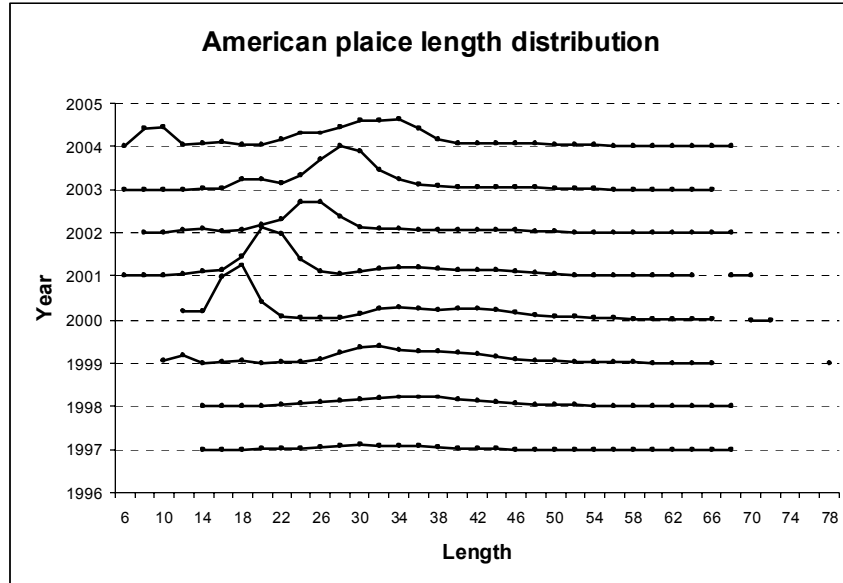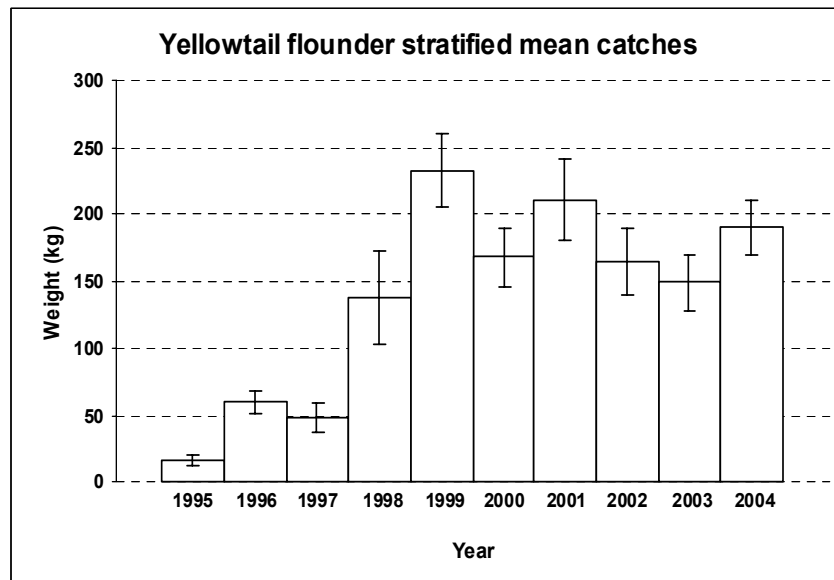

Fig. 2. American plaice biomass in tons and ±SD by year. Spanish Spring surveys on NAFO Div. 3NO: 1997-2004 (1997-2000 transformed data from C/V *Playa de Menduíña*; 2002-2004 original data from R/V *Vizconde de Eza*. In 2001, there are data from the two vessels).
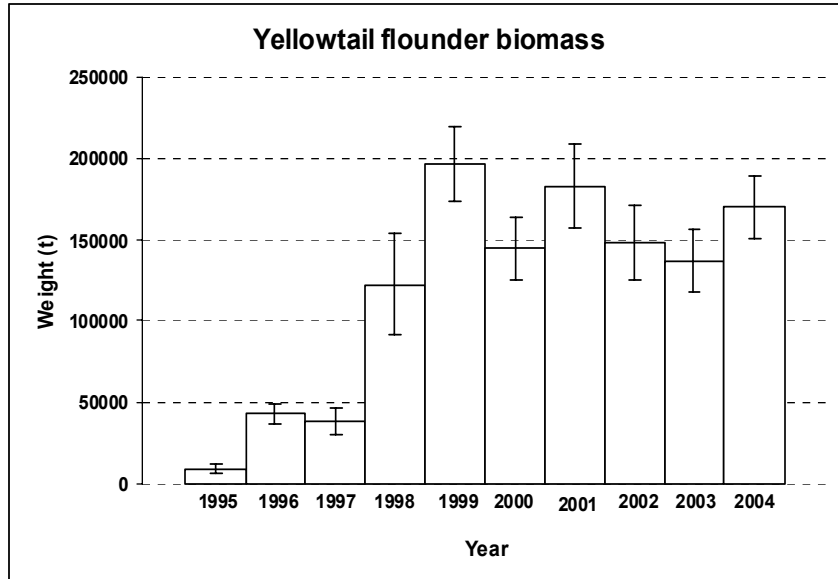
Fig. 3. American plaice length distribution (cm) on NAFO 3NO: 1997-2004. Estimated numbers per haul stratified mean catches. 1997-2000 data are transformed data from C/V *Playa de Menduíña*, and 2002-2004 data are original from R/V *Vizconde de Eza.* In 2001, there are data from the two vessels.

Fig. 4. Series of American plaice length distribution (cm) on NAFO 3NO: 1997-2004.

Fig. 5. Yellowtail flounder stratified mean catches in Kg and ±SD by year. Spanish Spring surveys on NAFO Div. 3NO: 1995-2004 (1995-2000 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).

Fig. **6.-**   Yellowtail flounder biomass in tons and ±SD by year. Spanish Spring surveys on NAFO Div. 3NO: 1995-2004 (1995-2000 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).
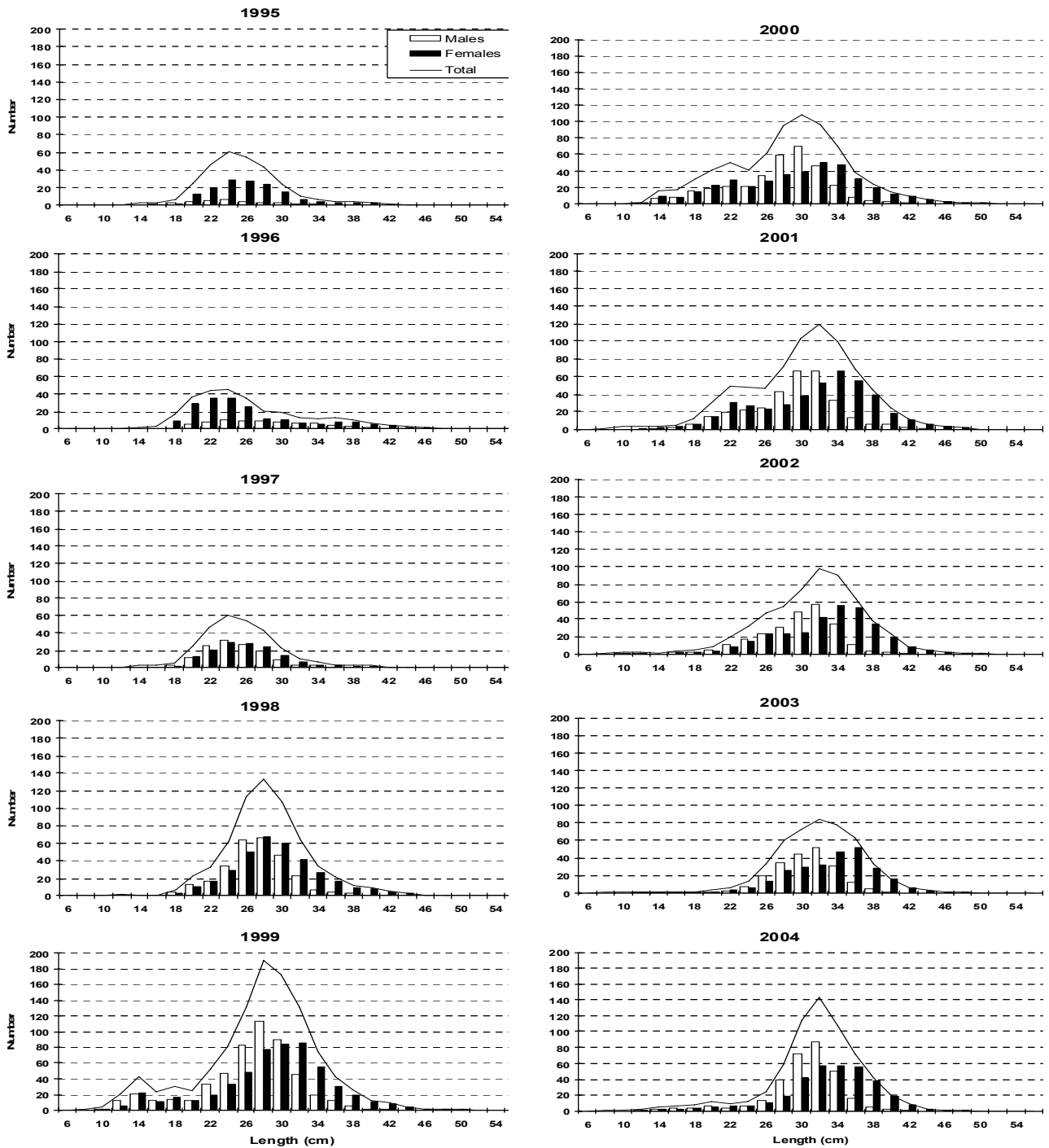
Fig. 7. Yellowtail flounder length distribution (cm) on NAFO 3NO: 1995-2004. Estimated numbers per haul stratified mean catches. 1995-2000 data are transformed data from C/V *Playa de Menduiña*, and 2002-2004 data are original from R/V *Vizconde de Eza*. In 2001, there are data from the two vessels
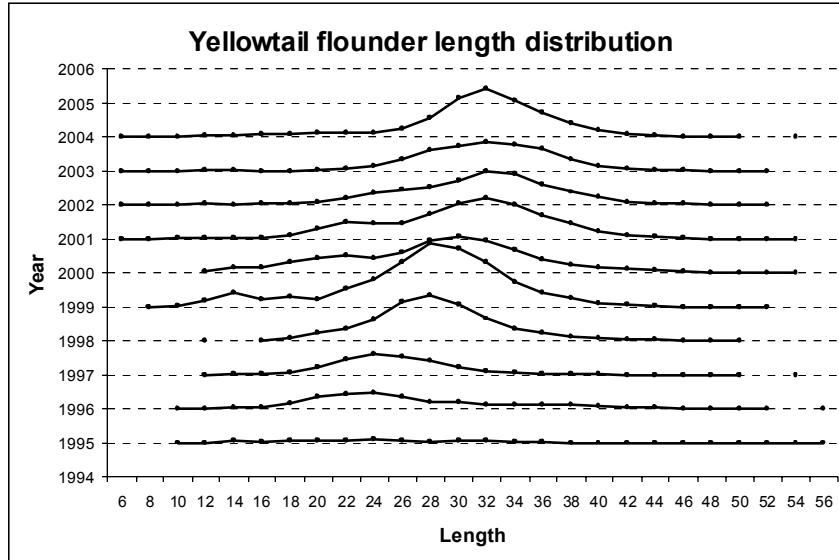
Fig. 8. Yellowtail flounder length distribution (cm) on NAFO 3NO: 1995-2004.