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Results for the Atlantic cod, roughhead grenadier, redfish, thorny skate and black dogfish of the Spanish Survey in the NAFO Div. 3L for the period 2003-2009

by

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Abstract

Since 2003, a stratified random spring bottom trawl survey was conducted by Spain in the NAFO Regulatory Area of Division 3L (Flemish Pass). The surveys were carried out by the R/V *"Vizconde de Eza"* using bottom trawl net type *Campelen*. Entire series of mean catches, biomass and length distribution for Atlantic cod, roughhead grenadier, redfish, thorny skate and black dogfish are presented for the period 2003-2009.

KEYWORDS: Survey, Flemish Pass, Atlantic Cod, Roughhead grenadier, Redfish, Thorny skate, Black dogfish.

Material and Methods

The surveys on NAFO Regulatory Area of Div. 3L (Flemish Pass) were initiated by Spain in 2003. The Research vessel *"Vizconde de Eza"* carried out the surveys following the same procedures and using the same bottom trawl gear *Campelen*. In 2003, the survey was carried out in spring (June) and it did not cover all strata adequately (69% of the total area prospected in 2006-2009). In 2004, the survey was carried out in August, for a period of nine days, and it covered only the 96%. In 2005, it was not possible to perform the survey due to problems with the winch of the ship; and in 2006, for the first time, an adequate prospecting survey was conducted in Division 3L with over 100 valid hauls. Table 1 shows the number of valid tows, the depth and number of covered strata and the dates of the survey series. To know more details about the technical specifications of the surveys, see Román *et al*., 2010.

The catch from each haul was sorted out and weighted by species and a sample of each species was taken in order to measure it and obtain the length distribution. In 2003 and 2004 the Atlantic cod samples were not sorted out by sex. There are two species of redfish in Division 3L (*Sebastes mentella* and *S. fasciatus*); the external characteristics of both species are very similar, which makes it difficult to distinguish between them and, as a result, they are treated together.

For Atlantic cod, redfish, thorny skate and black dogfish each individual of the sample was measured to the total length to the nearest lower cm and data are given in 2 cm intervals. However, roughhead grenadier individuals were measured from tip of snout to base of first anal-fin ray to the lower ½ cm., in 0.5 cm intervals, as adopted by NAFO in June 1980 (Atkinson, 1991) as a standard measurement for roundnose and roughhead grenadiers; length is presented as pre-anal-fin length (AFL) and data are given in 1 cm intervals.

It is presented the mean catch per haul, the stratified mean catch per haul and the biomass with their variance per year in the period 2003-2009. Length distribution in number per haul stratified mean catches per length, sex and year for these species are presented too. To obtain the biomass from length distribution, the following formula was used: $Weight=a(Length+0.5)^b$.

Results

Atlantic Cod (*Gadus morhua* Linnaeus, 1758)

NAFO manages 3 cod stocks in 3L, 3M and 3NO and a moratorium is in place for all 3 stocks. Cod had a dramatic decline during the eighties and nineties and fishing bans were imposed in the 1990s. In recent assessment all stocks remain at a very low level although spawning biomass has increased in recent years (NAFO, 2009).

Mean catches and biomass

Table 2 shows the swept area, the tow number, the mean catches and their variance per haul and year for Atlantic cod. Table 3 and Figure 1 present the stratified mean catches per stratum with the total variance per year. Table 4 and Figure 2 present the biomass per swept area per stratum and their total variance per year. Table 5 presents the length-weight relationships.

Atlantic cod indices show no clear trend along the whole period. A great variation in the cod indices can be seen, but this is due to a few hauls in which the presence of cod was very high. Stratified mean catch and biomass decreased from 2003 to 2004; then, the values of these indices increased in 2006 and declined briefly again in 2007. A great increase is shown in 2008 reaching the highest value in the period, but this was due to a single haul in which the presence of cod was very high (1298.5 kg). The great value of the variance in some years is due to the tows with a large catch. In 2009 the biomass reaches the second highest value in the time series, and in this case there is no haul with very high catches (the maximum was 286.1 kg.). The highest values in the estimated biomass have been observed in the shallow strata, in a range of depth from 93 to 274 meters.

Length distribution

Table 6 and 7 present the length distribution of stratified mean catches per haul for this species, by sex and year, with the number of samples in which there were length measures, the total number of individuals measured in these samples, the sampled catch and the range of lengths achieved, as well as the total catch of this species and the total hauls made in the survey. In Figures 3 and 4 the evolution along the years can be followed.

In this period, individuals between 12 and 25 cm can be seen although in 2004 there was no presence of individuals below 24 cm. In general all lengths presence is very low, even it is very difficult to follow the modal values. In 2008 we have a good presence of individuals between 26 and 33 cm, probably due to the haul with great catch of that year, 29 cm is the mode in the length distribution. In 2009 the dominant lengths are between 36 and 41 cm and the mode is 37 cm.

Roughhead grenadier (*Macrourus berglax* Lacépède, 1802)

Roughhead grenadier is not a regulated species. There is no directed fishery for this species and most catches are taken as by-catch in Greenland halibut fishery in Subareas 2 and 3. Roughhead grenadier is taken mainly in Div. 3LMN Regulatory Area. The highest level of observed catches was reached in 1998. The biomass of this species presents a decreasing trend in the last years (NAFO, 2009).

Mean catches and biomass

Roughhead grenadier haul mean catches by stratum are presented in Table 8; swept area, number of hauls and SD are also shown in this table. Stratified mean catches per tow by stratum and year and their variance are presented in Table 9. The entire time series (2003-2009) of biomass and their SD estimates of this species are shown in Table 10 and length-weight relationships are shown in Table 5.

The indices of Roughhead grenadier show no clear trend along the whole period, with an increasing in 2004 with respect to 2003 and then remain stable (2006-2007). In 2008 the biomass increased, being in this case the highest value of the series, and in 2009 a slight decrease can be seen (Fig. 5 and 6).

Length distribution

Table 11 and 12 show the stratified mean catches per haul length distribution, for roughhead grenadier, 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. The total catch of this species and the total hauls made in the survey are shown too. In Figures 4 and 7 the evolution along the years can be followed.

A slight recruitment can be seen in all period. Females attain larger lengths than males in all years.

Redfish (*Sebastes spp*. Cuvier, 1829)

There are three redfish species in the Northwest Atlantic, *Sebastes fasciatus* (Acadian redfish), *S.mentella* (deepwater redfish), and *S.marinus* (golden redfish). The redfish species are very similar in appearance and are reported collectively. In its regulations, NAFO does not differentiate between species and the catches are reported by genus only (*Sebastes spp*). The redfish stocks in 3LN, 3M, 3O, as well as Subarea 2 and Div. 1F+3K are managed by NAFO. There is a moratorium on 3LN stocks (no directed fishery) since 1998. The stock biomass, female spawning biomass and abundance is higher in 2006 than in the early 1990s (NAFO, 2009).

Mean catches and biomass

Table 13 shows the swept area, the tow number, the mean catches and their variance per haul and year for redfish. Table 14 and Figure 8 present the stratified mean catches per stratum with the total variance per year.

Table 15 and Figure 9 show the biomass estimate per swept area per stratum and their total variance by year. Redfish shows a great annual variability probably due to its pelagic habitat. The redfish biomass indices decreased in 2004 and 2007 and increased in 2006, 2008 and 2009, being in this last year the highest value of the series. The length-weight relationships are presented in Table 5.

Length distribution

Table 16 and 17 present the length distribution of the stratified mean catches per haul for redfish, 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. The total catch of this species and the total hauls made in the survey are also shown. In Figures 4 and 10 the evolution along the years can be followed.

The highest proportions of small redfish in the catches (less than 20 cm) were in 2007 and 2008.

Thorny skate (*Amblyraja radiata* Donovan, 1808)

NAFO started to regulate skates, under a 3-year plan, in 2004. The state of the stock is unclear; the biomass has been stable from 1996 to 2005 but at lower level than in the mid-1980s. Since then the catches have declined (NAFO, 2009).

Mean catches and biomass

Table 18 shows the swept area, the tow number, the mean catches and their variance per haul and year for thorny skate. Table 19 presents the length-weight relationships. Table 20 and Figure 11 present the stratified mean catches per stratum with the total variance per year. Table 21 and Figure 12 present the biomass per swept area per stratum and their total variance per year. The indices of the thorny skate decreased since 2003 until 2004, increased for 2006-2007 and decreased again in 2008 and 2009.

Length distribution

Table 22 and 23 present the stratified mean catches per haul length distribution for this species, 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 achieved, as well as the total catch of this species and the total hauls made in the survey. In Figures 13 and 14, the evolution along the years can be followed. The highest proportion of small thorny skate in the catches was in 2007.

Black dogfish (*Centroscyllium fabricii* Reinhardt, 1825)

Black dogfish is present in all Divisions, but is more abundant in Div. 3NO and in depths of more than 900 m. Black dogfish is not a regulated species and commercial catches of this species are mainly a by-catch of the Greenland halibut fishery in Div. 3LMNO (González-Costas *et al*., 2006).

Mean catches and biomass

Black dogfish haul mean catches by stratum are presented in Table 24, including swept area, number of hauls and SD. Stratified mean catches per tow by stratum and year and their variance are presented in Table 25. The entire time series (2003-2008) of biomass and their SD estimates of black dogfish are shown in Table 26. Length-weight relationships are presented in Table 19.

The abundance and biomass present the same trend as mean catches. Biomass estimated from the 3L survey displays an increasing trend since 2004 until 2007 and decreased in 2008. In this year, the indices remain stables with a slight decrease (Fig. 15 and 16). In 2003, the catches occurred only in two strata (745 and 749), in which the catches were much different, that is why the variance in this year is so large.

Length distribution

Table 27 and 28 present the length distribution of the stratified mean catches per haul for black dogfish, 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. The total catch of this species and the total hauls made in the survey are shown too. In Figures 14 and 17 the evolution along the years can be followed.

There is no presence of small individual (less than 40 cm). Size compositions are mainly between 50 and 80 cm of length.

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TABLE 1.- Spanish bottom trawl surveys in NAFO Division 3L for the period 2003-2009.

Year	Vessel	Valid tows	Depth strata covered (m)	Surveyed strata (no.)	Dates
2003	R/V *"Vizconde de Eza"*	39	118-1100	17	June 2 - June 6, June 29
2004	R/V *"Vizconde de Eza"*	50	141-1452	23	August 7 - August 15
2005	-	-	-	-	-
2006	R/V *"Vizconde de Eza"*	100	116-1449	24	July 31 - August 18
2007	R/V *"Vizconde de Eza"*	94	119-1449	24	July 23 - August 11
2008	R/V *"Vizconde de Eza"*	100	105-1455	24	July 24 - August 11
2009	R/V *Vizconde de Eza*	98	111-1458	24	July 25 - August 12

TABLE 2.- Swept area, number of hauls and **Atlantic cod** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2009, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

Stratum	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
	2003 (*)				**2004**				**2006**			
385	0.0225	2	0.062	0.040	0.0229	2	0.450	0.636	0.0229	2	1.783	2.521
387	0.0229	2	4.390	1.004	0.0214	2	1.885	1.888	0.0225	2	0.395	0.559
388	0.0334	3	7.870	6.987	0.0105	1	1.313	-	0.0566	5	7.028	5.142
389	0.0454	4	0.844	1.573	0.0225	2	0.510	0.721	0.0795	7	10.582	14.986
390	0.0563	5	0.000	0.000	0.0345	3	0.000	0.000	0.1249	11	0.081	0.249
391	0.0338	3	0.167	0.289	0.0218	2	0.000	0.000	0.0450	4	14.338	13.278
392	0.0116	1	0.400	-	0.0214	2	13.219	17.991	0.0229	2	2.045	1.506
729	0.0210	2	1.260	1.782	0.0221	2	0.000	0.000	0.0338	3	0.000	0.000
730	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0326	3	0.000	0.000
731	0.0229	2	22.405	13.329	0.0233	2	0.496	0.530	0.0341	3	0.000	0.000
732	0.0113	1	0.000	-	0.0210	2	0.000	0.000	0.0334	3	0.000	0.000
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	0.000	0.000	0.0454	4	0.000	0.000
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	0.000	0.000	0.0225	2	0.000	0.000
741	0.0113	1	0.000	-	0.0323	3	0.000	0.000	0.0218	2	0.000	0.000
742	0.0116	1	0.000	-	0.0120	1	0.000	-	0.0229	2	0.000	0.000
743	n.s.	n.s.	n.s.	n.s.	0.0188	2	0.000	0.000	0.0225	2	0.000	0.000
744	n.s.	n.s.	n.s.	n.s.	0.0101	1	0.000	-	0.0229	2	0.000	0.000
745	0.0341	3	0.000	0.000	0.0319	3	0.000	0.000	0.0686	6	0.000	0.000
746	0.0446	4	0.000	0.000	0.0338	3	0.000	0.000	0.0675	6	0.000	0.000
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	0.000	0.000	0.1230	11	0.000	0.000
748	0.0109	1	0.000	-	0.0199	2	0.000	0.000	0.0326	3	0.000	0.000
749	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0229	2	0.000	0.000
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	0.000	0.000	0.1005	9	0.000	0.000
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s	n.s	0.0454	4	0.000	0.000
	2007				**2008**				**2009**			
385	0.0225	2	0.835	1.181	0.0229	2	6.051	6.537	0.0225	2	5.285	3.514
387	0.0225	2	1.992	1.105	0.0435	4	5.386	5.633	0.0439	4	23.204	40.440
388	0.0563	5	7.434	7.400	0.0559	5	18.665	19.454	0.0555	5	7.413	3.853
389	0.0900	8	4.162	4.621	0.0780	7	30.523	18.566	0.0803	7	40.874	54.955
390	0.1350	12	1.369	1.251	0.1395	12	8.682	15.848	0.1373	12	22.441	43.094
391	0.0450	4	11.183	15.378	0.0454	4	342.268	637.574	0.0458	4	65.264	62.051
392	0.0225	2	13.985	7.779	0.0221	2	0.000	0.000	0.0229	2	0.063	0.089
729	0.0338	3	0.000	0.000	0.0338	3	0.000	0.000	0.0341	3	0.000	0.000
730	0.0225	2	0.000	0.000	0.0323	3	0.000	0.000	0.0338	3	0.000	0.000
731	0.0338	3	0.510	0.883	0.0330	3	0.130	0.225	0.0341	3	0.000	0.000
732	0.0338	3	0.000	0.000	0.0446	4	0.000	0.000	0.0450	4	0.000	0.000
733	0.0338	3	0.427	0.739	0.0431	4	0.000	0.000	0.0450	4	0.000	0.000
734	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0218	2	0.000	0.000
741	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0221	2	0.000	0.000
742	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0214	2	0.000	0.000
743	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000	0.0203	2	0.000	0.000
744	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0210	2	0.000	0.000
745	0.0675	6	0.000	0.000	0.0555	5	0.000	0.000	0.0559	5	0.000	0.000
746	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000	0.0668	6	0.000	0.000
747	0.1238	11	0.000	0.000	0.1069	10	0.000	0.000	0.1118	10	0.000	0.000
748	0.0338	3	0.000	0.000	0.0218	2	0.000	0.000	0.0229	2	0.000	0.000
749	0.0113	1	0.000	-	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000
750	0.0679	6	0.000	0.000	0.0844	8	0.000	0.000	0.0791	7	0.000	0.000
751	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000	0.0338	3	0.000	0.000

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

TABLE 3.- Stratified mean catches (Kg) and SD of **Atlantic cod** by stratum and year (2003-2009). Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2009.

			Survey				
Stratum	2003	2004	2005	2006	2007	2008	2009
385	7.26	53.10	-	210.34	98.53	713.96	623.63
387	1123.84	482.56	-	101.12	509.82	1378.75	5940.16
388	2809.59	468.74	-	2509.00	2653.87	6663.55	2646.51
389	429.34	259.59	-	5386.31	2118.59	15536.35	20804.94
390	0.00	0.00	-	65.94	1115.80	7076.10	18289.28
391	47.00	0.00	-	4043.18	3153.47	96519.44	18404.45
392	58.00	1916.68	-	296.53	2027.75	0.00	9.14
729	234.36	0.00	-	0.00	0.00	0.00	0.00
730	0.00	0.00	-	0.00	0.00	0.00	0.00
731	4839.48	107.03	-	0.00	110.16	28.08	0.00
732	0.00	0.00	-	0.00	0.00	0.00	0.00
733	n.s	0.00	-	0.00	99.84	0.00	0.00
734	n.s	0.00	-	0.00	0.00	0.00	0.00
741	0.00	0.00	-	0.00	0.00	0.00	0.00
742	0.00	0.00	-	0.00	0.00	0.00	0.00
743	n.s	0.00	-	0.00	0.00	0.00	0.00
744	n.s	0.00	-	0.00	0.00	0.00	0.00
745	0.00	0.00	-	0.00	0.00	0.00	0.00
746	0.00	0.00	-	0.00	0.00	0.00	0.00
747	n.s	0.00	-	0.00	0.00	0.00	0.00
748	0.00	0.00	-	0.00	0.00	0.00	0.00
749	0.00	0.00	-	0.00	0.00	0.00	0.00
750	n.s	0.00	-	0.00	0.00	0.00	0.00
751	n.s	n.s	-	0.00	0.00	0.00	0.00
TOTAL	9548.87	3287.70		12612.40	11887.83	127916.23	66718.10
	2.13	0.53		1.94	1.83	19.72	10.28
SD	0.57	0.30		0.55	0.42	13.89	2.75

TABLE 4.- Survey estimates (by the swept area method) of **Atlantic cod** biomass (t.) and SD by stratum and year on NAFO Div. 3L (R/V *Vizconde de Eza*). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	Survey						
Stratum	2003	2004	2005	2006	2007	2008	2009
385	1	5	-	18	9	62	55
387	98	45	-	9	45	127	542
388	253	45	-	222	236	596	238
389	38	23	-	474	188	1394	1815
390	0	0	-	6	99	609	1599
391	4	0	-	359	280	8509	1609
392	5	179	-	26	180	0	1
729	22	0	-	0	0	0	0
730	0	0	-	0	0	0	0
731	423	9	-	0	10	3	0
732	0	0	-	0	0	0	0
733	n.s	0	-	0	9	0	0
734	n.s	0	-	0	0	0	0
741	0	0	-	0	0	0	0
742	0	0	-	0	0	0	0
743	n.s	0	-	0	0	0	0
744	n.s	0	-	0	0	0	0
745	0	0	-	0	0	0	0
746	0	0	-	0	0	0	0
747	n.s	0	-	0	0	0	0
748	0	0	-	0	0	0	0
749	0	0	-	0	0	0	0
750	n.s	0	-	0	0	0	0
751	n.s	n.s	-	0	0	0	0
TOTAL	844	306		1114	1057	11300	5859
SD	222	180		315	245	7745	1556

Table 5.- Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2003-2009 for **Atlantic Cod, roughhead grenadier and redfish**. The equation is Weight=a(Length+0.5)^b. To calculate the parameters for the indeterminate individuals, we used the total data (males+females+indeterminate individuals).

	Atlantic cod				Roughhead grenadier				Redfish			
Year	Sex	L-W Equations	N	r^2	Sex	L-W Equations	N	r^2	Sex	L-W Equations	N	r^2
2003	All	$W = 0.0059\ L^{3.0965}$	161	0.9875	All	$W = 0.0766\ L^{3.0029}$	478	0.9872	All	$W = 0.0037\ L^{3.3842}$	238	0.9902
	Males	-	-	-	Males	$W = 0.0482\ L^{3.1908}$	172	0.9772	Males	$W = 0.0103\ L^{3.0686}$	95	0.9787
	Females	-	-	-	Females	$W = 0.0824\ L^{2.9761}$	290	0.9913	Females	$W = 0.0060\ L^{3.2380}$	90	0.993
2004	All	$W = 0.0045\ L^{3.2037}$	58	0.9805	All	$W = 0.0791\ L^{3.0113}$	1066	0.9896	All	$W = 0.0083\ L^{3.1377}$	237	0.9808
	Males	-	-	-	Males	$W = 0.0085\ L^{2.9868}$	458	0.9866	Males	$W = 0.0161\ L^{2.9333}$	97	0.9877
	Females	-	-	-	Females	$W = 0.0788\ L^{3.0119}$	597	0.9906	Females	$W = 0.0190\ L^{2.8927}$	117	0.9881
2006	All	$W = 0.0057\ L^{3.3142}$	308	0.9854	All	$W = 0.0773\ L^{3.0264}$	1645	0.9817	All	$W = 0.0096\ L^{3.1034}$	920	0.9835
	Males	$W = 0.0043\ L^{3.2188}$	142	0.9808	Males	$W = 0.0664\ L^{3.0810}$	655	0.9748	Males	$W = 0.0100\ L^{3.0871}$	444	0.9843
	Females	$W = 0.0069\ L^{3.0874}$	166	0.9896	Females	$W = 0.0893\ L^{2.9794}$	975	0.986	Females	$W = 0.0091\ L^{3.1221}$	471	0.9811
2007	All	$W = 0.0055\ L^{3.1370}$	225	0.983	All	$W = 0.0885\ L^{2.9691}$	1950	0.9895	All	$W = 0.0080\ L^{3.1588}$	881	0.9842
	Males	$W = 0.0061\ L^{3.1114}$	107	0.991	Males	$W = 0.0946\ L^{2.9435}$	754	0.9859	Males	$W = 0.0140\ L^{2.9836}$	432	0.9858
	Females	$W = 0.0047\ L^{3.1750}$	118	0.9735	Females	$W = 0.0877\ L^{2.9727}$	1165	0.9897	Females	$W = 0.0133\ L^{3.0115}$	392	0.9868
2008	All	$W = 0.0083\ L^{3.0479}$	819	0.9856	All	$W = 0.1237\ L^{2.8681}$	1773	0.9871	All	$W = 0.0142\ L^{2.9849}$	699	0.9701
	Males	$W = 0.0083\ L^{3.0493}$	403	0.9855	Males	$W = 0.1174\ L^{2.8868}$	754	0.9832	Males	$W = 0.0337\ L^{2.7219}$	338	0.9343
	Females	$W = 0.0084\ L^{3.0467}$	416	0.9856	Females	$W = 0.1144\ L^{2.8938}$	1024	0.988	Females	$W = 0.0314\ L^{2.7511}$	340	0.9412
2009	All	$W = 0.0084\ L^{3.0256}$	684	0.9824	All	$W = 0.0903\ L^{2.9583}$	1457	0.9911	All	$W = 0.0083\ L^{3.1392}$	818	0.9854
	Males	$W = 0.0089\ L^{3.0085}$	296	0.9824	Males	$W = 0.0847\ L^{2.9803}$	540	0.9871	Males	$W = 0.0135\ L^{2.9882}$	354	0.9738
	Females	$W = 0.0083\ L^{3.0299}$	388	0.9821	Females	$W = 0.0927\ L^{2.9505}$	899	0.9904	Females	$W = 0.0174\ L^{2.9204}$	389	0.9763

TABLE 6.- Atlantic cod length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2006 (R/V *Vizconde de Eza*). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2003 (*)				2004				2006			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
12	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.10	0.10	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
18	0.00	0.00	0.06	0.06	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
20	0.00	0.00	0.10	0.10	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.03
22	0.00	0.00	0.18	0.18	0.00	0.00	0.00	0.00	0.05	0.02	0.00	0.08
24	0.00	0.00	0.34	0.34	0.00	0.00	0.02	0.02	0.08	0.10	0.00	0.18
26	0.00	0.00	0.38	0.38	0.00	0.00	0.03	0.03	0.09	0.16	0.00	0.25
28	0.00	0.00	0.24	0.24	0.00	0.00	0.06	0.06	0.09	0.19	0.00	0.27
30	0.00	0.00	0.30	0.30	0.00	0.00	0.15	0.15	0.13	0.19	0.00	0.32
32	0.00	0.00	0.27	0.27	0.00	0.00	0.03	0.03	0.20	0.11	0.00	0.30
34	0.00	0.00	0.28	0.28	0.00	0.00	0.05	0.05	0.15	0.10	0.00	0.25
36	0.00	0.00	0.37	0.37	0.00	0.00	0.09	0.09	0.12	0.11	0.00	0.23
38	0.00	0.00	0.35	0.35	0.00	0.00	0.15	0.15	0.11	0.12	0.00	0.23
40	0.00	0.00	0.20	0.20	0.00	0.00	0.10	0.10	0.05	0.12	0.00	0.17
42	0.00	0.00	0.38	0.38	0.00	0.00	0.10	0.10	0.12	0.07	0.00	0.18
44	0.00	0.00	0.10	0.10	0.00	0.00	0.06	0.06	0.13	0.10	0.00	0.23
46	0.00	0.00	0.12	0.12	0.00	0.00	0.03	0.03	0.11	0.13	0.00	0.24
48	0.00	0.00	0.13	0.13	0.00	0.00	0.01	0.01	0.03	0.09	0.00	0.12
50	0.00	0.00	0.08	0.08	0.00	0.00	0.03	0.03	0.03	0.05	0.00	0.08
52	0.00	0.00	0.12	0.12	0.00	0.00	0.00	0.00	0.02	0.05	0.00	0.08
54	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.04	0.00	0.04
56	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
58	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
60	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
62	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
64	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
66	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
68	0.00	0.00	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
70	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
76	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
80	0.00	0.00	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	0.00	0.00	4.30	4.30	0.00	0.00	0.92	0.92	1.57	1.82	0.00	3.38
Nº samples:				14				9				22
Nº Ind.:	-	-	160	160	-	-	55	55	143	167	0	310
Sampled catch:				84				34				176
Range:				13-81				24-55				13-79
Total catch:				84				34				176
Total hauls:				40				58				101

TABLE 7.- Atlantic cod length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2007-2009 (R/V *Vizconde de Eza*). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2007				2008				2009			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
12	0.00	0.01	0.00	0.01	0.01	0.02	0.00	0.04	0.00	0.01	0.00	0.01
14	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
16	0.02	0.00	0.00	0.02	0.08	0.03	0.00	0.11	0.01	0.00	0.00	0.01
18	0.04	0.03	0.00	0.07	0.19	0.15	0.00	0.34	0.00	0.00	0.00	0.00
20	0.04	0.00	0.00	0.04	0.14	0.13	0.00	0.27	0.02	0.01	0.00	0.03
22	0.02	0.01	0.00	0.03	0.12	0.19	0.00	0.31	0.06	0.06	0.00	0.12
24	0.01	0.01	0.00	0.02	1.21	1.36	0.00	2.56	0.08	0.05	0.00	0.13
26	0.01	0.00	0.00	0.01	5.14	6.23	0.00	11.37	0.12	0.12	0.00	0.24
28	0.02	0.04	0.00	0.06	8.51	10.05	0.00	18.56	0.14	0.18	0.00	0.32
30	0.05	0.02	0.00	0.07	6.60	7.42	0.00	14.02	0.20	0.15	0.00	0.36
32	0.05	0.06	0.00	0.12	2.99	3.61	0.00	6.60	0.39	0.37	0.00	0.77
34	0.07	0.06	0.00	0.14	1.94	0.81	0.00	2.74	0.66	1.04	0.00	1.70
36	0.07	0.13	0.00	0.21	0.83	0.78	0.00	1.61	1.11	1.16	0.00	2.26
38	0.14	0.17	0.00	0.31	0.32	0.35	0.00	0.67	1.09	1.42	0.00	2.51
40	0.11	0.14	0.00	0.25	0.14	0.29	0.00	0.43	0.92	1.07	0.00	1.99
42	0.10	0.14	0.00	0.24	0.06	0.37	0.00	0.43	0.49	0.76	0.00	1.25
44	0.11	0.07	0.00	0.18	0.13	0.05	0.00	0.19	0.28	0.47	0.00	0.75
46	0.02	0.13	0.00	0.15	0.09	0.29	0.00	0.37	0.15	0.37	0.00	0.52
48	0.07	0.04	0.00	0.12	0.07	0.24	0.00	0.31	0.04	0.15	0.00	0.18
50	0.02	0.03	0.00	0.05	0.06	0.09	0.00	0.16	0.08	0.14	0.00	0.22
52	0.02	0.05	0.00	0.07	0.22	0.07	0.00	0.29	0.07	0.13	0.00	0.20
54	0.05	0.02	0.00	0.07	0.04	0.06	0.00	0.10	0.07	0.08	0.00	0.15
56	0.02	0.04	0.00	0.06	0.04	0.02	0.00	0.06	0.09	0.11	0.00	0.20
58	0.03	0.03	0.00	0.06	0.19	0.03	0.00	0.22	0.01	0.13	0.00	0.14
60	0.01	0.01	0.00	0.02	0.02	0.02	0.00	0.04	0.02	0.07	0.00	0.09
62	0.01	0.01	0.00	0.02	0.05	0.03	0.00	0.09	0.03	0.04	0.00	0.07
64	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.06	0.01	0.06	0.00	0.07
66	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04	0.01	0.03	0.00	0.04
68	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.01	0.02	0.00	0.03
70	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.03	0.00	0.04
72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
74	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01
76	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
78	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	1.13	1.30	0.00	2.43	29.27	32.78	0.00	62.05	6.18	8.25	0.00	14.44
Nº samples:				32				34				32
Nº Ind.:	107	119	0	226	739	827	0	1566	580	781	0	1361
Sampled catch:				168				1814				957
Range:				12-76				12-74				13-77
Total catch:				168				1814				957
Total hauls:				99				103				103

TABLE 8.- Swept area, number of hauls and **roughhead grenadier** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2009, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

Stratum	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
	2003 (*)				**2004**				**2006**			
385	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0229	2	0.000	0.000
387	0.0229	2	0.000	0.000	0.0214	2	59.987	23.598	0.0225	2	34.790	20.520
388	0.0334	3	0.000	0.000	0.0105	1	43.300		0.0566	5	26.406	7.803
389	0.0454	4	0.000	0.000	0.0225	2	1.875	2.652	0.0795	7	1.426	2.642
390	0.0563	5	0.560	1.252	0.0345	3	0.007	0.012	0.1249	11	0.000	0.000
391	0.0338	3	0.017	0.029	0.0218	2	0.018	0.025	0.0450	4	178.123	304.579
392	0.0116	1	3.900	-	0.0214	2	200.650	255.195	0.0229	2	118.025	159.347
729	0.0210	2	37.750	4.596	0.0221	2	29.475	17.501	0.0338	3	25.164	23.944
730	0.0221	2	101.050	37.972	0.0221	2	33.715	0.544	0.0326	3	53.270	7.021
731	0.0229	2	3.510	1.824	0.0233	2	10.450	5.162	0.0341	3	10.512	3.252
732	0.0113	1	34.400	-	0.0210	2	39.490	7.594	0.0334	3	22.164	9.200
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	15.553	5.137	0.0454	4	23.450	16.806
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	65.850	106.305	0.0225	2	39.315	9.638
741	0.0113	1	8.700	-	0.0323	3	1.055	1.342	0.0218	2	17.557	23.112
742	0.0116	1	24.400	-	0.0120	1	4.700	-	0.0229	2	20.933	7.015
743	n.s.	n.s.	n.s.	n.s.	0.0188	2	26.245	6.017	0.0225	2	10.574	6.353
744	n.s.	n.s.	n.s.	n.s.	0.0101	1	2.550	-	0.0229	2	15.365	15.111
745	0.0341	3	17.547	10.764	0.0319	3	5.800	2.722	0.0686	6	8.238	5.438
746	0.0446	4	63.800	71.784	0.0338	3	26.205	21.151	0.0675	6	41.767	29.972
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	43.627	13.999	0.1230	11	42.307	40.112
748	0.0109	1	55.980	-	0.0199	2	22.515	18.547	0.0326	3	67.920	73.796
749	0.0221	2	145.200	23.193	0.0221	2	45.900	51.336	0.0229	2	25.930	31.919
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	56.750	36.416	0.1005	9	16.866	18.117
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0454	4	4.253	3.543
	2007				**2008**				**2009**			
385	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000
387	0.0225	2	45.990	51.746	0.0435	4	20.320	11.817	0.0439	4	30.045	16.013
388	0.0563	5	37.663	22.136	0.0559	5	15.056	11.298	0.0555	5	27.627	27.428
389	0.0900	8	3.075	8.697	0.0780	7	19.007	23.458	0.0803	7	31.105	63.627
390	0.1350	12	0.000	0.000	0.1395	12	0.580	1.338	0.1373	12	4.648	14.283
391	0.0450	4	86.525	171.255	0.0454	4	248.947	142.328	0.0458	4	72.878	56.298
392	0.0225	2	129.950	138.805	0.0221	2	58.175	54.836	0.0229	2	60.934	78.701
729	0.0338	3	26.490	13.222	0.0338	3	19.943	6.923	0.0341	3	9.991	5.382
730	0.0225	2	81.378	33.061	0.0323	3	35.119	29.483	0.0338	3	75.453	99.963
731	0.0338	3	14.333	7.365	0.0330	3	14.333	10.000	0.0341	3	4.980	1.654
732	0.0338	3	11.151	3.253	0.0446	4	21.545	3.045	0.0450	4	8.289	3.314
733	0.0338	3	19.104	14.162	0.0431	4	23.939	36.979	0.0450	4	19.108	13.978
734	0.0225	2	23.400	8.202	0.0221	2	30.580	20.182	0.0218	2	28.777	12.760
741	0.0225	2	4.650	6.166	0.0210	2	10.359	10.390	0.0221	2	11.334	6.316
742	0.0225	2	14.493	2.011	0.0210	2	16.861	11.943	0.0214	2	3.425	1.803
743	0.0225	2	29.666	25.928	0.0203	2	25.509	13.847	0.0203	2	13.278	13.438
744	0.0218	2	33.965	0.375	0.0221	2	58.670	15.570	0.0210	2	8.208	6.495
745	0.0675	6	3.624	1.509	0.0555	5	14.284	7.402	0.0559	5	3.787	2.256
746	0.0664	6	34.607	22.333	0.0638	6	30.720	16.486	0.0668	6	23.474	20.537
747	0.1238	11	62.510	26.732	0.1069	10	28.717	25.198	0.1118	10	33.180	25.868
748	0.0338	3	33.533	16.455	0.0218	2	217.340	286.322	0.0229	2	92.330	127.477
749	0.0113	1	28.700	-	0.0214	2	47.452	11.670	0.0225	2	13.700	9.334
750	0.0679	6	19.516	24.114	0.0844	8	11.937	6.673	0.0791	7	16.895	14.145
751	0.0225	2	24.445	7.983	0.0413	4	9.038	8.141	0.0338	3	88.193	144.495

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

TABLE 9.- Stratified mean catches (Kg) and SD of **roughhead grenadier** by stratum and year (2003-2009). Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2009.

				Survey			
Stratum	2003	2004	2005	2006	2007	2008	2009
385	0.00	0.00	-	0.00	0.00	0.00	0.00
387	0.00	15356.54	-	8906.24	11773.44	5201.92	7691.52
388	0.00	15458.10	-	9426.94	13445.76	5374.85	9862.70
389	0.00	954.38	-	725.69	1565.18	9674.64	15832.37
390	456.40	5.43	-	0.00	0.00	472.70	3787.71
391	4.70	4.94	-	50230.55	24400.05	70203.05	20551.46
392	565.50	29094.25	-	17113.63	18842.75	8435.38	8835.43
729	7021.50	5482.35	-	4680.44	4927.20	3709.46	1858.39
730	17178.50	5731.55	-	9055.90	13834.26	5970.29	12827.07
731	758.16	2257.20	-	2270.52	3095.93	3095.93	1075.61
732	7946.40	9122.19	-	5119.88	2575.96	4976.90	1914.82
733	n.s	3639.48	-	5487.30	4470.26	5601.67	4471.16
734	n.s	10075.05	-	6015.20	3580.20	4678.66	4402.88
741	870.00	105.53	-	1755.70	465.00	1035.90	1133.40
742	1561.60	300.80	-	1339.68	927.55	1079.10	219.20
743	n.s	1338.50	-	539.27	1512.97	1300.93	677.18
744	n.s	168.30	-	1014.09	2241.69	3872.22	541.70
745	6106.24	2018.40	-	2866.88	1261.09	4970.83	1317.95
746	25009.60	10272.36	-	16372.53	13565.94	12042.24	9201.61
747	n.s	31585.71	-	30630.47	45257.17	20791.04	24022.61
748	8900.82	3579.89	-	10799.28	5331.80	34557.06	14680.47
749	18295.20	5783.40	-	3267.18	3616.20	5978.95	1726.20
750	n.s	31553.00	-	9377.25	10850.99	6636.90	9393.86
751	n.s	n.s	-	973.82	5597.91	2069.59	20196.12
TOTAL	94674.62	183887.34		197968.44	193139.30	221730.20	176221.39
$(\bar{y})$	21.16	29.38		30.52	29.77	34.18	27.17
SD	3.38	5.27		7.41	4.86	6.12	4.97

TABLE 10.- Survey estimates (by the swept area method) of **roughhead grenadier** biomass (t.) and SD by stratum and year on NAFO Div. 3L (R/V *Vizconde de Eza*). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	Survey						
Stratum	2003	2004	2005	2006	2007	2008	2009
385	0	0	-	0	0	0	0
387	0	1437	-	792	1047	478	701
388	0	1472	-	832	1195	481	889
389	0	85	-	64	139	868	1381
390	41	0	-	0	0	41	331
391	0	0	-	4465	2169	6189	1797
392	49	2722	-	1496	1675	763	772
729	669	496	-	416	438	330	163
730	1553	518	-	833	1230	555	1140
731	66	194	-	200	275	281	95
732	706	869	-	460	229	446	170
733	n.s	331	-	484	397	520	397
734	n.s	995	-	535	318	423	405
741	77	10	-	161	41	99	102
742	134	25	-	117	82	103	21
743	n.s	143	-	48	134	128	67
744	n.s	17	-	89	206	350	52
745	537	190	-	251	112	448	118
746	2242	913	-	1455	1226	1133	827
747	n.s	3082	-	2739	4023	1945	2150
748	818	360	-	993	474	3178	1284
749	1654	523	-	286	321	559	153
750	n.s	3506	-	840	959	629	831
751	n.s	n.s	-	86	498	201	1795
TOTAL	8546	17887		17641	17190	20148	15641
SD	1340	3240		4271	2799	3534	2844

TABLE 11.- Roughhead grenadier length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2006 (R/V Vizconde de Eza). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2003 (*)				2004				2006			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
1.5	0.00	0.00	0.03	0.03	0.00	0.00	0.02	0.02	0.00	0.00	0.04	0.04
2.5	0.37	0.16	0.67	1.20	0.02	0.02	0.06	0.10	0.07	0.04	0.02	0.13
3.5	0.17	0.11	0.20	0.48	0.77	0.21	0.18	1.15	0.61	0.16	0.14	0.91
4.5	0.18	0.20	0.00	0.39	0.09	0.07	0.00	0.16	0.14	0.00	0.00	0.14
5.5	1.68	1.70	0.00	3.38	0.36	0.42	0.00	0.77	0.12	0.15	0.00	0.27
6.5	0.94	0.88	0.00	1.82	0.72	1.08	0.00	1.80	0.91	0.71	0.00	1.63
7.5	0.55	0.34	0.00	0.88	0.32	0.39	0.00	0.71	0.62	0.48	0.00	1.10
8.5	0.60	0.86	0.00	1.46	0.80	0.92	0.00	1.72	0.46	0.50	0.00	0.97
9.5	0.53	0.68	0.00	1.21	1.05	1.12	0.00	2.17	0.95	0.87	0.00	1.82
10.5	1.17	1.10	0.00	2.27	0.87	0.55	0.00	1.42	0.87	0.98	0.00	1.84
11.5	0.90	0.94	0.00	1.84	1.03	1.13	0.00	2.16	1.36	1.26	0.00	2.62
12.5	1.48	0.84	0.00	2.33	1.47	1.27	0.00	2.74	1.83	1.78	0.01	3.61
13.5	1.87	1.40	0.00	3.26	1.64	1.05	0.00	2.69	1.66	1.75	0.01	3.41
14.5	2.95	2.53	0.00	5.48	2.35	1.70	0.00	4.05	1.91	1.77	0.00	3.67
15.5	3.44	2.54	0.00	5.98	3.43	2.57	0.00	6.00	2.21	1.64	0.00	3.85
16.5	2.94	3.11	0.00	6.04	4.60	3.44	0.00	8.03	2.19	1.86	0.00	4.04
17.5	1.76	2.94	0.00	4.70	3.98	3.20	0.00	7.18	3.45	1.88	0.01	5.34
18.5	0.82	1.67	0.00	2.49	3.59	2.73	0.00	6.32	2.99	2.03	0.00	5.02
19.5	0.63	1.36	0.00	1.99	1.98	2.90	0.00	4.88	1.73	2.94	0.00	4.66
20.5	0.18	1.10	0.00	1.28	1.09	1.73	0.00	2.82	0.91	2.50	0.00	3.41
21.5	0.07	1.07	0.00	1.14	0.13	1.13	0.00	1.26	0.51	2.60	0.00	3.11
22.5	0.03	0.76	0.00	0.79	0.22	0.75	0.00	0.97	0.10	1.73	0.00	1.83
23.5	0.01	0.61	0.00	0.62	0.00	0.57	0.00	0.57	0.03	1.44	0.00	1.47
24.5	0.00	0.41	0.00	0.41	0.00	0.69	0.00	0.69	0.01	0.94	0.00	0.95
25.5	0.00	0.58	0.00	0.58	0.01	0.43	0.00	0.45	0.00	0.84	0.00	0.84
26.5	0.00	0.47	0.00	0.47	0.00	0.60	0.00	0.60	0.00	0.63	0.00	0.63
27.5	0.00	0.47	0.00	0.47	0.00	0.15	0.00	0.15	0.00	0.25	0.00	0.25
28.5	0.00	0.35	0.00	0.35	0.00	0.30	0.00	0.30	0.00	0.31	0.00	0.31
29.5	0.00	0.26	0.00	0.26	0.00	0.24	0.00	0.24	0.00	0.20	0.00	0.20
30.5	0.00	0.23	0.00	0.23	0.00	0.21	0.00	0.21	0.00	0.10	0.00	0.10
31.5	0.00	0.09	0.00	0.09	0.00	0.24	0.00	0.24	0.00	0.13	0.00	0.13
32.5	0.00	0.07	0.00	0.07	0.00	0.04	0.00	0.04	0.00	0.09	0.00	0.09
33.5	0.00	0.06	0.00	0.06	0.00	0.01	0.00	0.01	0.00	0.04	0.00	0.04
34.5	0.00	0.03	0.00	0.03	0.00	0.09	0.00	0.09	0.00	0.03	0.00	0.03
35.5	0.00	0.03	0.00	0.03	0.00	0.08	0.00	0.08	0.00	0.01	0.00	0.01
36.5	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.05	0.00	0.05
37.5	0.00	0.04	0.00	0.04	0.00	0.06	0.00	0.06	0.00	0.01	0.00	0.01
38.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
39.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	23.27	29.98	0.89	54.14	30.53	32.08	0.26	62.86	25.64	32.68	0.23	58.54
Nº samples:				22				43				83
Nº Ind.:	943	1268	37	2248	1188	1359	17	2564	2107	2423	25	4555
Sampled catch:				1013				1579				2985
Range:				2-38				2-37.5				1.5-39
Total catch:				1013				1579				2985
Total hauls:				40				58				101

TABLE 12.- Rroughhead grenadier length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2007-2009 (R/V *Vizconde de Eza*). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2007				2008				2009			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
1.5	0.00	0.02	0.01	0.03	0.00	0.00	0.02	0.02	0.00	0.00	0.01	0.01
2.5	0.00	0.04	0.15	0.19	0.00	0.03	0.09	0.13	0.01	0.00	0.13	0.15
3.5	0.40	0.17	0.70	1.26	0.28	0.08	1.42	1.78	0.27	0.16	1.01	1.44
4.5	0.08	0.06	0.02	0.16	0.11	0.01	0.03	0.15	0.07	0.00	0.05	0.12
5.5	0.34	0.21	0.02	0.57	0.10	0.13	0.01	0.24	0.12	0.13	0.00	0.25
6.5	0.94	0.75	0.00	1.69	0.69	0.64	0.03	1.36	0.38	0.45	0.00	0.83
7.5	0.28	0.33	0.00	0.61	0.24	0.38	0.00	0.62	0.11	0.23	0.00	0.35
8.5	0.54	0.68	0.01	1.23	0.39	0.46	0.00	0.85	0.25	0.30	0.00	0.54
9.5	0.60	0.81	0.00	1.42	0.74	0.58	0.00	1.31	0.38	0.51	0.00	0.89
10.5	0.84	0.55	0.00	1.39	0.87	0.77	0.00	1.63	0.56	0.52	0.00	1.08
11.5	1.21	1.12	0.00	2.32	1.19	1.32	0.00	2.51	0.56	0.99	0.00	1.55
12.5	1.13	1.22	0.00	2.35	1.07	1.20	0.00	2.26	1.24	0.91	0.00	2.15
13.5	1.46	1.45	0.00	2.91	1.58	1.36	0.00	2.93	1.33	1.44	0.00	2.77
14.5	1.89	1.71	0.00	3.60	2.16	1.77	0.00	3.94	1.58	1.53	0.00	3.11
15.5	1.54	1.47	0.00	3.01	2.61	2.21	0.00	4.82	1.92	1.90	0.00	3.81
16.5	1.74	1.56	0.00	3.29	2.60	2.67	0.00	5.26	1.96	1.80	0.00	3.76
17.5	1.97	1.45	0.00	3.41	1.92	1.97	0.00	3.89	1.71	1.96	0.00	3.67
18.5	1.85	1.38	0.00	3.23	1.60	1.74	0.00	3.34	1.31	1.52	0.00	2.83
19.5	1.57	1.57	0.00	3.14	1.36	1.77	0.00	3.13	0.97	1.24	0.00	2.22
20.5	0.98	1.70	0.00	2.67	0.82	1.89	0.00	2.71	0.59	1.22	0.00	1.81
21.5	0.40	2.38	0.00	2.78	0.37	1.71	0.00	2.09	0.30	1.23	0.00	1.53
22.5	0.15	2.18	0.00	2.32	0.10	1.82	0.00	1.91	0.15	1.21	0.00	1.37
23.5	0.05	1.90	0.00	1.95	0.03	1.83	0.00	1.86	0.01	1.33	0.00	1.35
24.5	0.00	1.49	0.00	1.49	0.00	2.28	0.00	2.29	0.00	1.25	0.00	1.25
25.5	0.01	1.18	0.00	1.20	0.00	1.87	0.00	1.87	0.01	1.18	0.00	1.19
26.5	0.00	1.05	0.00	1.05	0.00	1.53	0.00	1.53	0.00	1.19	0.00	1.19
27.5	0.00	0.69	0.00	0.69	0.00	0.88	0.00	0.88	0.00	0.82	0.00	0.82
28.5	0.01	0.37	0.00	0.38	0.00	0.62	0.00	0.62	0.00	0.52	0.00	0.52
29.5	0.01	0.35	0.00	0.37	0.00	0.58	0.00	0.58	0.00	0.46	0.00	0.46
30.5	0.00	0.28	0.00	0.28	0.00	0.15	0.00	0.15	0.00	0.27	0.00	0.27
31.5	0.00	0.21	0.00	0.21	0.00	0.11	0.00	0.11	0.00	0.23	0.00	0.23
32.5	0.00	0.07	0.00	0.07	0.00	0.07	0.00	0.07	0.00	0.14	0.00	0.14
33.5	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.09	0.00	0.09
34.5	0.00	0.08	0.00	0.08	0.00	0.00	0.00	0.00	0.00	0.08	0.00	0.08
35.5	0.00	0.05	0.00	0.05	0.00	0.01	0.00	0.01	0.00	0.03	0.00	0.03
36.5	0.00	0.04	0.00	0.04	0.00	0.02	0.00	0.02	0.00	0.03	0.00	0.03
37.5	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
38.5	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
39.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40.5	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
41.5	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
Total	19.99	30.65	0.90	51.54	20.84	34.48	1.59	56.91	15.78	26.93	1.21	43.93
Nº samples:				71				87				81
Nº Ind.:	1589	2246	69	3904	2022	3019	176	5217	1409	2319	105	3833
Sampled catch:				2712				3286.9				2541
Range:				2-41				1.5-42.5				2.0-41.5
Total catch:				2712				3286.9				2543
Total hauls:				99				103				103

TABLE 13.- Swept area, number of hauls and **redfish** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2009, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

Stratum	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
	2003 (*)				**2004**				**2006**			
385	0.0225	2	0.001	0.001	0.0229	2	0.005	0.007	0.0229	2	0.000	0.000
387	0.0229	2	1.715	1.110	0.0214	2	56.000	51.619	0.0225	2	113.685	116.171
388	0.0334	3	6.453	6.142	0.0105	1	11.800	-	0.0566	5	66.040	32.355
389	0.0454	4	0.801	0.912	0.0225	2	33.050	44.901	0.0795	7	46.008	84.876
390	0.0563	5	0.580	1.242	0.0345	3	0.000	0.000	0.1249	11	0.188	0.318
391	0.0338	3	0.087	0.085	0.0218	2	1.435	1.718	0.0450	4	7.135	5.793
392	0.0116	1	46.300	-	0.0214	2	1222.320	1712.075	0.0229	2	4367.190	5741.976
729	0.0210	2	88.800	73.963	0.0221	2	310.250	239.780	0.0338	3	202.167	262.943
730	0.0221	2	231.080	64.389	0.0221	2	55.550	72.761	0.0326	3	145.923	148.390
731	0.0229	2	39.365	8.252	0.0233	2	79.550	68.236	0.0341	3	19.053	7.921
732	0.0113	1	72.200	-	0.0210	2	42.025	55.119	0.0334	3	5.638	7.067
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	111.667	109.389	0.0454	4	72.600	47.167
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	5.383	7.029	0.0225	2	12.328	3.921
741	0.0113	1	2240.000	-	0.0323	3	0.255	0.255	0.0218	2	0.000	0.000
742	0.0116	1	0.000	-	0.0120	1	0.331	-	0.0229	2	0.000	0.000
743	n.s.	n.s.	n.s.	n.s.	0.0188	2	2.090	2.956	0.0225	2	0.000	0.000
744	n.s.	n.s.	n.s.	n.s.	0.0101	1	0.000	-	0.0229	2	0.000	0.000
745	0.0341	3	1753.100	3028.408	0.0319	3	0.000	0.000	0.0686	6	0.119	0.221
746	0.0446	4	0.000	0.000	0.0338	3	0.000	0.000	0.0675	6	0.118	0.185
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	0.200	0.346	0.1230	11	0.000	0.000
748	0.0109	1	2.700	-	0.0199	2	0.440	0.622	0.0326	3	0.130	0.225
749	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0229	2	0.000	0.000
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	0.000	0.000	0.1005	9	0.000	0.000
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0454	4	0.000	0.000
	2007				**2008**				**2009**			
385	0.0225	2	0.041	0.027	0.0229	2	0.495	0.644	0.0225	2	0.275	0.389
387	0.0225	2	80.400	34.083	0.0435	4	185.125	58.384	0.0439	4	568.427	761.003
388	0.0563	5	162.078	100.787	0.0559	5	212.750	142.882	0.0555	5	1686.275	2522.618
389	0.0900	8	10.723	18.542	0.0780	7	385.331	509.833	0.0803	7	321.423	836.313
390	0.1350	12	0.173	0.473	0.1395	12	0.922	2.280	0.1373	12	0.086	0.182
391	0.0450	4	6.013	6.351	0.0454	4	1093.130	1444.102	0.0458	4	243.571	371.869
392	0.0225	2	959.650	350.230	0.0221	2	209.150	15.203	0.0229	2	797.546	42.491
729	0.0338	3	128.889	184.792	0.0338	3	618.467	508.067	0.0341	3	50.830	11.765
730	0.0225	2	367.737	518.964	0.0323	3	29.790	42.861	0.0338	3	167.600	193.999
731	0.0338	3	37.100	28.646	0.0330	3	132.967	154.885	0.0341	3	37.000	30.152
732	0.0338	3	12.115	13.539	0.0446	4	11.975	11.596	0.0450	4	8.311	9.503
733	0.0338	3	115.667	70.383	0.0431	4	132.600	203.165	0.0450	4	59.725	53.776
734	0.0225	2	24.728	28.585	0.0221	2	22.485	27.457	0.0218	2	16.220	17.367
741	0.0225	2	0.000	0.000	0.0210	2	0.555	0.049	0.0221	2	0.903	0.012
742	0.0225	2	0.300	0.424	0.0210	2	0.000	0.000	0.0214	2	0.000	0.000
743	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000	0.0203	2	5.575	7.884
744	0.0218	2	0.479	0.677	0.0221	2	0.000	0.000	0.0210	2	0.000	0.000
745	0.0675	6	0.380	0.450	0.0555	5	0.364	0.664	0.0559	5	0.000	0.000
746	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000	0.0668	6	0.043	0.106
747	0.1238	11	0.000	0.000	0.1069	10	0.012	0.039	0.1118	10	0.000	0.000
748	0.0338	3	0.830	1.050	0.0218	2	4.290	6.067	0.0229	2	1.576	2.228
749	0.0113	1	0.000	-	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000
750	0.0679	6	0.000	0.000	0.0844	8	0.000	0.000	0.0791	7	0.230	0.609
751	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000	0.0338	3	0.000	0.000

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

TABLE 14.- Stratified mean catches (Kg) and SD of **redfish** by stratum and year (2003-2009). Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2009.

	Survey						
Stratum	2003	2004	2005	2006	2007	2008	2009
385	0.12	0.59	-	0.00	4.84	58.35	32.45
387	439.04	14336.00	-	29103.36	20582.40	47392.00	145517.18
388	2303.84	4212.60	-	23576.28	57861.85	75951.75	602000.18
389	407.58	16822.45	-	23418.22	5458.01	196133.55	163604.53
390	472.70	0.00	-	153.59	141.00	751.23	70.36
391	24.44	404.67	-	2012.07	1695.53	308262.66	68687.02
392	6713.50	177236.40	-	633242.55	139149.25	30326.75	115644.17
729	16516.80	57706.50	-	37603.00	23973.29	115034.80	9454.32
730	39283.60	9443.50	-	24806.97	62515.29	5064.30	28492.00
731	8502.84	17182.80	-	4115.52	8013.60	28720.80	7992.00
732	16678.20	9707.78	-	1302.46	2798.49	2766.23	1919.90
733	n.s	26130.00	-	16988.40	27066.00	31028.40	13975.65
734	n.s	823.65	-	1886.11	3783.31	3440.21	2481.66
741	224000.00	25.50	-	0.00	0.00	55.50	90.25
742	0.00	21.18	-	0.00	19.20	0.00	0.00
743	n.s	106.59	-	0.00	0.00	0.00	284.33
744	n.s	0.00	-	0.00	31.58	0.00	0.00
745	610078.80	0.00	-	41.47	132.24	126.74	0.00
746	0.00	0.00	-	46.39	0.00	0.00	16.99
747	n.s	144.80	-	0.00	0.00	8.98	0.00
748	429.30	69.96	-	20.67	131.97	682.11	250.50
749	0.00	0.00	-	0.00	0.00	0.00	0.00
750	n.s	0.00	-	0.00	0.00	0.00	127.88
751	n.s	n.s	-	0.00	0.00	0.00	0.00
TOTAL	925850.76	334374.97		798317.04	353357.83	845804.35	1160641.36
	206.94	53.43		123.06	54.47	130.38	178.92
$(\bar{y})$	136.03	28.87		90.99	11.94	36.35	69.07

TABLE 15.- Survey estimates (by the swept area method) of **redfish** biomass (t.) and SD by stratum and year on NAFO Div. 3L (R/V *Vizconde de Eza*). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	Survey						
Stratum	2003	2004	2005	2006	2007	2008	2009
385	0	0	-	0	0	5	3
387	38	1341	-	2587	1830	4358	13267
388	207	401	-	2082	5143	6797	54234
389	36	1495	-	2062	485	17602	14271
390	42	0	-	14	13	65	6
391	2	37	-	179	151	27175	6005
392	578	16584	-	55365	12369	2741	10111
729	1573	5216	-	3342	2131	10225	831
730	3551	854	-	2281	5557	471	2533
731	743	1478	-	362	712	2611	703
732	1483	925	-	117	249	248	171
733	n.s	2375	-	1498	2406	2878	1242
734	n.s	81	-	168	336	311	228
741	19911	2	-	0	0	5	8
742	0	2	-	0	2	0	0
743	n.s	11	-	0	0	0	28
744	n.s	0	-	0	3	0	0
745	53633	0	-	4	12	11	0
746	0	0	-	4	0	0	2
747	n.s	14	-	0	0	1	0
748	39	7	-	2	12	63	22
749	0	0	-	0	0	0	0
750	n.s	0	-	0	0	0	11
751	n.s	n.s	-	0	0	0	0
TOTAL	81837	30825		70066	31410	75567	103675
SD	50717	17163		50718	6885	20435	40871

TABLE 16.- Redfish length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2006 (R/V *Vizconde de Eza*). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2003 (*)				2004				2006			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
4	0.00	0.00	0.19	0.19	0.00	0.00	0.04	0.04	0.00	0.01	0.00	0.01
6	0.00	0.00	7.29	7.29	0.00	0.00	3.68	3.68	0.10	0.05	2.83	2.98
8	0.03	0.09	1.64	1.77	0.24	0.09	5.05	5.39	0.90	1.28	13.68	15.86
10	1.24	0.70	0.71	2.64	3.48	2.03	1.69	7.20	2.18	1.28	1.82	5.28
12	2.75	1.19	0.00	3.94	4.86	3.30	4.93	13.09	3.00	3.27	0.12	6.40
14	3.74	28.78	0.00	32.52	3.92	1.83	2.16	7.91	11.25	8.43	0.00	19.68
16	3.18	1.41	0.00	4.59	8.87	5.17	0.26	14.30	20.69	19.49	0.00	40.18
18	4.39	27.40	0.00	31.79	11.87	12.09	0.00	23.96	14.29	13.66	0.00	27.95
20	6.00	4.17	0.00	10.18	23.04	20.03	0.00	43.07	23.65	11.01	0.00	34.66
22	5.98	5.11	0.00	11.09	19.46	18.47	0.00	37.93	41.88	31.01	0.00	72.89
24	65.49	63.97	0.00	129.46	30.92	12.78	0.00	43.70	40.39	44.21	0.00	84.60
26	11.52	141.79	0.00	153.31	35.91	14.43	0.00	50.34	9.50	58.30	0.00	67.79
28	52.41	5.79	0.00	58.21	16.80	12.42	0.00	29.22	8.69	64.05	0.00	72.74
30	54.15	82.48	0.00	136.63	5.36	5.65	0.00	11.01	6.12	47.61	0.00	53.73
32	56.44	29.72	0.00	86.16	0.52	2.70	0.00	3.22	4.13	23.73	0.00	27.86
34	1.45	29.51	0.00	30.96	0.16	0.59	0.00	0.76	0.72	3.74	0.00	4.47
36	0.18	0.65	0.00	0.83	0.30	0.37	0.00	0.66	0.12	2.15	0.00	2.27
38	0.09	0.00	0.00	0.09	0.12	0.05	0.00	0.17	0.08	1.05	0.00	1.12
40	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.03
42	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
44	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
50	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	269.04	422.79	9.83	701.67	165.84	111.99	17.82	295.65	187.71	334.38	18.45	540.54
Nº samples:				22				28				48
Nº Ind.:	965	799	304	2068	1903	1662	409	3974	3205	3089	1205	7499
Sampled catch:				8366				3970				11080
Range:				5-40				5-39				5-48
Total catch:				8368				3970				11080
Total hauls:				40				58				101

TABLE 17.- Redfish length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2007-2009 (R/V *Vizconde de Eza*). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2007				2008				2009			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
4	0.00	0.00	0.04	0.04	0.00	0.00	0.16	0.16	0.00	0.00	0.01	0.01
6	0.00	0.00	17.45	17.45	0.00	0.00	8.19	8.19	0.00	0.00	1.44	1.44
8	0.01	0.19	26.86	27.06	0.00	0.00	17.35	17.35	0.00	0.00	7.73	7.73
10	1.45	2.17	1.64	5.26	0.81	0.21	57.74	58.76	0.12	0.14	6.53	6.79
12	4.45	3.71	0.53	8.69	3.70	2.13	17.78	23.62	0.78	0.36	8.74	9.87
14	3.44	1.80	0.01	5.25	8.31	3.62	0.11	12.04	3.23	2.04	5.53	10.80
16	5.97	3.81	0.00	9.77	19.39	18.88	0.00	38.27	46.42	22.66	0.79	69.87
18	11.85	13.08	0.00	24.92	66.37	46.99	0.05	113.41	133.26	137.85	0.00	271.11
20	25.50	15.85	0.00	41.35	96.85	63.72	0.00	160.57	115.15	92.22	0.08	207.45
22	36.00	30.40	0.00	66.41	81.51	63.44	0.00	144.94	117.95	120.09	0.00	238.03
24	19.89	32.60	0.00	52.48	49.16	50.05	0.00	99.21	67.44	106.44	0.00	173.88
26	7.34	11.29	0.00	18.63	25.59	33.03	0.00	58.62	15.72	82.79	0.00	98.51
28	4.69	6.69	0.00	11.39	22.11	21.05	0.00	43.16	9.27	17.36	0.00	26.62
30	4.33	5.57	0.00	9.90	10.25	9.73	0.00	19.99	2.75	10.77	0.00	13.52
32	5.48	7.42	0.00	12.90	3.50	4.98	0.00	8.48	2.46	4.50	0.00	6.96
34	2.66	2.82	0.00	5.48	1.11	2.86	0.00	3.96	2.23	2.06	0.00	4.29
36	0.20	0.96	0.00	1.16	0.49	0.68	0.00	1.18	0.60	1.49	0.00	2.10
38	0.05	0.13	0.00	0.18	0.06	0.29	0.00	0.35	0.15	0.03	0.00	0.19
40	0.02	0.03	0.00	0.06	0.01	0.12	0.00	0.13	0.32	0.37	0.00	0.70
42	0.01	0.03	0.00	0.04	0.01	0.11	0.00	0.12	0.00	0.04	0.00	0.04
44	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.31	0.00	0.31
46	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.13	0.00	0.00	0.00	0.00
48	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.30	0.00	0.30
50	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
52	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	133.36	138.57	46.53	318.46	389.23	322.03	101.39	812.65	517.84	601.84	30.85	1150.53
Nº samples:				51				52				51
Nº Ind.:	2669	2360	2016	7045	3957	3147	1372	8476	3016	2723	558	6297
Sampled catch:				4675				12283				16615
Range:				5-53				5-47				5-49
Total catch:				4675				12283				16615
Total hauls:				99				103				103

TABLE 18.- Swept area, number of hauls and **thorny skate** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2009, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

Stratum	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
	2003 (*)				**2004**				**2006**			
385	0.0225	2	0.000	0.000	0.0229	2	7.050	9.970	0.0229	2	6.044	4.588
387	0.0229	2	5.295	4.957	0.0214	2	10.700	2.263	0.0225	2	16.438	16.599
388	0.0334	3	13.273	13.347	0.0105	1	16.700		0.0566	5	44.186	24.414
389	0.0454	4	5.984	5.117	0.0225	2	10.900	13.294	0.0795	7	32.979	14.712
390	0.0563	5	0.190	0.425	0.0345	3	1.997	1.730	0.1249	11	5.529	7.479
391	0.0338	3	1.723	1.509	0.0218	2	64.250	65.125	0.0450	4	151.088	51.460
392	0.0116	1	10.050	-	0.0214	2	62.300	0.141	0.0229	2	149.500	165.604
729	0.0210	2	54.955	31.176	0.0221	2	140.375	186.712	0.0338	3	49.261	27.663
730	0.0221	2	71.400	60.670	0.0221	2	0.000	0.000	0.0326	3	4.348	7.532
731	0.0229	2	38.705	25.873	0.0233	2	18.510	22.330	0.0341	3	46.757	62.791
732	0.0113	1	76.200		0.0210	2	0.000	0.000	0.0334	3	2.015	1.851
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	9.363	5.299	0.0454	4	14.573	8.911
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	0.000	0.000	0.0225	2	0.000	0.000
741	0.0113	1	0	-	0.0323	3	0.000	0.000	0.0218	2	0.000	0.000
742	0.0116	1	0	-	0.0120	1	0.000		0.0229	2	0.000	0.000
743	n.s.	n.s.	n.s.	n.s.	0.0188	2	0.000	0.000	0.0225	2	0.000	0.000
744	n.s.	n.s.	n.s.	n.s.	0.0101	1	0.000		0.0229	2	0.000	0.000
745	0.0341	3	22.077	21.917	0.0319	3	0.000	0.000	0.0686	6	0.000	0.000
746	0.0446	4	2.318	3.703	0.0338	3	0.000	0.000	0.0675	6	0.000	0.000
747	n.s.	n.s.			0.0308	3	0.000	0.000	0.1230	11	0.000	0.000
748	0.0109	1	65.220	-	0.0199	2	0.000	0.000	0.0326	3	0.837	1.449
749	0.0221	2	8.060	6.067	0.0221	2	0.000	0.000	0.0229	2	0.000	0.000
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	1.375	1.945	0.1005	9	0.393	1.180
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0454	4	0.000	0.000
	2007				**2008**				**2009**			
385	0.0225	2	30.260	11.653	0.0229	2	37.608	26.315	0.0225	2	22.855	12.155
387	0.0225	2	32.485	2.143	0.0435	4	26.276	17.380	0.0439	4	20.590	15.584
388	0.0563	5	31.096	13.246	0.0559	5	37.148	12.932	0.0555	5	33.480	11.888
389	0.0900	8	25.861	11.704	0.0780	7	33.065	8.029	0.0803	7	12.954	7.076
390	0.1350	12	7.366	7.441	0.1395	12	5.044	7.191	0.1373	12	14.043	24.187
391	0.0450	4	100.658	56.818	0.0454	4	190.795	35.749	0.0458	4	31.899	30.002
392	0.0225	2	330.100	170.554	0.0221	2	159.247	95.534	0.0229	2	41.322	31.215
729	0.0338	3	164.760	243.624	0.0338	3	34.265	25.540	0.0341	3	38.090	23.526
730	0.0225	2	0.000	0.000	0.0323	3	0.000	0.000	0.0338	3	0.000	0.000
731	0.0338	3	57.448	64.552	0.0330	3	9.140	13.870	0.0341	3	22.847	22.201
732	0.0338	3	0.000	0.000	0.0446	4	0.727	1.454	0.0450	4	7.100	11.428
733	0.0338	3	6.427	8.497	0.0431	4	14.693	15.502	0.0450	4	4.315	6.530
734	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0218	2	0.000	0.000
741	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0221	2	0.000	0.000
742	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0214	2	0.000	0.000
743	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000	0.0203	2	1.395	1.973
744	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0210	2	0.000	0.000
745	0.0675	6	0.000	0.000	0.0555	5	0.000	0.000	0.0559	5	0.000	0.000
746	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000	0.0668	6	0.000	0.000
747	0.1238	11	0.000	0.000	0.1069	10	0.000	0.000	0.1118	10	0.000	0.000
748	0.0338	3	0.000	0.000	0.0218	2	0.000	0.000	0.0229	2	0.000	0.000
749	0.0113	1	0.000	-	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000
750	0.0679	6	0.000	0.000	0.0844	8	0.000	0.000	0.0791	7	0.000	0.000
751	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000	0.0338	3	0.000	0.000

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

Table 19.- Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2003-2009 for the **thorny skate** and **black dogfish**. The equation is $Weight=a(Length+0.5)^b$. To calculate the parameters for the indeterminate individuals, we used the total data (males+females+indeterminate individuals).

Year	Sex	Length-Weight Equations	N	r^2
Thorny skate				
2003	All	$W = 0.0050\ L^{3.1712}$	305	0.9896
	Males	$W = 0.0051\ L^{3.1619}$	141	0.9906
	Females	$W = 0.0048\ L^{3.1855}$	164	0.9888
2004	All	$W = 0.0067\ L^{3.1187}$	186	0.9661
	Males	$W = 0.0054\ L^{3.1684}$	94	0.9700
	Females	$W = 0.0086\ L^{3.0629}$	92	0.9639
2006	All	$W = 0.0084\ L^{3.0587}$	491	0.9830
	Males	$W = 0.0103\ L^{3.0011}$	210	0.9847
	Females	$W = 0.0061\ L^{3.1402}$	281	0.9814
2007	All	$W = 0.0080\ L^{3.0609}$	539	0.9848
	Males	$W = 0.0091\ L^{3.0242}$	255	0.9868
	Females	$W = 0.0072\ L^{3.0929}$	284	0.9839
2008	All	$W = 0.0071\ L^{3.0883}$	598	0.9884
	Males	$W = 0.0077\ L^{3.0618}$	282	0.9903
	Females	$W = 0.0064\ L^{3.1175}$	316	0.9867
2009	All	$W = 0.0072\ L^{3.0862}$	283	0.9864
	Males	$W = 0.0093\ L^{3.0231}$	171	0.9848
	Females	$W = 0.0057\ L^{3.1507}$	112	0.9881
Black dogfish				
2003	All	$W = 0.0081\ L^{2.8882}$	20	0.9637
	Males	$W = 0.1143\ L^{2.2194}$	5	0.9382
	Females	$W = 0.0072\ L^{2.9265}$	15	0.9782
2004	All	$W = 0.0025\ L^{3.1608}$	113	0.9592
	Males	$W = 0.0272\ L^{2.5776}$	58	0.8969
	Females	$W = 0.0013\ L^{3.3314}$	55	0.9809
2006	All	$W = 0.0011\ L^{3.3758}$	283	0.9216
	Males	$W = 0.0071\ L^{2.9000}$	99	0.9233
	Females	$W = 0.0008\ L^{3.4608}$	184	0.9363
2007	All	$W = 0.0008\ L^{3.4421}$	362	0.9155
	Males	$W = 0.0099\ L^{2.8281}$	147	0.9029
	Females	$W = 0.0006\ L^{3.5445}$	215	0.9373
2008	All	$W = 0.0014L^{3.3183}$	279	0.9006
	Males	$W = 0.0087\ L^{2.8575}$	160	0.8956
	Females	$W = 0.0008\ L^{3.4541}$	119	0.9283
2009	All	$W = 0.0007\ L3^{.4922}$	236	0.9246
	Males	$W = 0.0132\ L^{2.7605}$	75	0.8865
	Females	$W = 0.0007\ L^{3.5184}$	161	0.9465

TABLE 20.- Stratified mean catches (Kg) and SD of **thorny skate** by stratum and year (2003-2009). Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2009.

	Survey						
Stratum	2003	2004	2005	2006	2007	2008	2009
385	0.00	831.90	-	713.19	3570.68	4437.69	2696.89
387	1355.52	2739.20	-	4208.00	8316.16	6726.59	5271.04
388	4738.58	5961.90	-	15774.40	11101.27	13261.69	11952.50
389	3045.60	5548.10	-	16786.09	13163.25	16830.16	6593.66
390	154.85	1627.28	-	4506.21	6003.36	4110.66	11444.98
391	485.98	18118.50	-	42606.68	28385.42	53804.19	8995.45
392	1457.25	9033.50	-	21677.50	47864.50	23090.82	5991.69
729	10221.63	26109.75	-	9162.48	30645.36	6373.35	7084.74
730	12138.00	0.00	-	739.22	0.00	0.00	0.00
731	8360.28	3998.16	-	10099.44	12408.84	1974.24	4934.88
732	17602.20	0.00	-	465.47	0.00	167.94	1640.10
733	n.s	2191.02	-	3410.14	1503.84	3438.05	1009.71
734	n.s	0.00	-	0.00	0.00	0.00	0.00
741	0.00	0.00	-	0.00	0.00	0.00	0.00
742	0.00	0.00	-	0.00	0.00	0.00	0.00
743	n.s	0.00	-	0.00	0.00	0.00	71.15
744	n.s	0.00	-	0.00	0.00	0.00	0.00
745	7682.68	0.00	-	0.00	0.00	0.00	0.00
746	908.46	0.00	-	0.00	0.00	0.00	0.00
747	n.s	0.00	-	0.00	0.00	0.00	0.00
748	10369.98	0.00	-	133.03	0.00	0.00	0.00
749	1015.56	0.00	-	0.00	0.00	0.00	0.00
750	n.s	764.50	-	218.69	0.00	0.00	0.00
751	n.s	n.s	-	0.00	0.00	0.00	0.00
TOTAL	79536.57	76923.81		130500.54	162962.67	134215.36	67686.78
$(\bar{y})$	17.78	12.29		20.12	25.12	20.69	10.43
SD	2.41	4.54		3.27	5.19	1.92	1.44

TABLE 21.- Survey estimates (by the swept area method) of **thorny skate** biomass (t.) and SD by stratum and year on NAFO Div. 3L (R/V *Vizconde de Eza*). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	Survey						
Stratum	2003	2004	2005	2006	2007	2008	2009
385	0	73	-	62	317	388	240
387	119	256	-	374	739	619	481
388	426	568	-	1393	987	1187	1077
389	268	493	-	1478	1170	1510	575
390	14	142	-	397	534	354	1001
391	43	1666	-	3787	2523	4743	786
392	125	845	-	1895	4255	2087	524
729	973	2360	-	814	2724	567	623
730	1097	0	-	68	0	0	0
731	731	344	-	888	1103	179	434
732	1565	0	-	42	0	15	146
733	n.s	199	-	301	134	319	90
734	n.s	0	-	0	0	0	0
741	0	0	-	0	0	0	0
742	0	0	-	0	0	0	0
743	n.s	0	-	0	0	0	7
744	n.s	0	-	0	0	0	0
745	675	0	-	0	0	0	0
746	81	0	-	0	0	0	0
747	n.s	0	-	0	0	0	0
748	954	0	-	12	0	0	0
749	92	0	-	0	0	0	0
750	n.s	85	-	20	0	0	0
751	n.s	n.s	-	0	0	0	0
TOTAL	7164	7031		11531	14486	11968	5982
SD	942	2642		1887	2993	1124	808

TABLE 22.- Thorny skate length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2006 (R/V *Vizconde de Eza*). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2003 (*)				2004				2006			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
10	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.09	0.07	0.00	0.15	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.05
14	0.19	0.08	0.00	0.27	0.04	0.00	0.00	0.04	0.09	0.00	0.00	0.09
16	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.04	0.03	0.00	0.07
18	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.03	0.02	0.00	0.06
20	0.00	0.03	0.00	0.03	0.00	0.02	0.00	0.02	0.03	0.03	0.00	0.06
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.01	0.00	0.05
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.01	0.00	0.03
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
32	0.07	0.02	0.00	0.09	0.01	0.02	0.00	0.04	0.03	0.01	0.00	0.05
34	0.05	0.08	0.00	0.13	0.01	0.00	0.00	0.01	0.01	0.03	0.00	0.05
36	0.19	0.20	0.00	0.39	0.01	0.00	0.00	0.01	0.02	0.01	0.00	0.03
38	0.23	0.40	0.00	0.64	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04
40	0.14	0.43	0.00	0.57	0.04	0.05	0.00	0.10	0.05	0.03	0.00	0.08
42	0.35	0.65	0.00	1.00	0.07	0.07	0.00	0.13	0.00	0.03	0.00	0.03
44	0.32	0.61	0.00	0.93	0.10	0.25	0.00	0.35	0.01	0.03	0.00	0.05
46	0.23	0.46	0.00	0.69	0.14	0.14	0.00	0.28	0.09	0.08	0.00	0.17
48	0.42	0.51	0.00	0.94	0.17	0.12	0.00	0.30	0.10	0.08	0.00	0.18
50	0.35	0.34	0.00	0.69	0.26	0.24	0.00	0.50	0.13	0.17	0.00	0.30
52	0.57	0.36	0.00	0.93	0.35	0.26	0.00	0.61	0.22	0.13	0.00	0.35
54	0.32	0.32	0.00	0.64	0.33	0.14	0.00	0.47	0.27	0.37	0.00	0.64
56	0.56	0.43	0.00	0.99	0.32	0.23	0.00	0.55	0.22	0.24	0.00	0.45
58	0.25	0.39	0.00	0.63	0.32	0.24	0.00	0.56	0.22	0.46	0.00	0.67
60	0.17	0.26	0.00	0.44	0.41	0.20	0.00	0.61	0.36	0.39	0.00	0.75
62	0.36	0.14	0.00	0.50	0.11	0.15	0.00	0.26	0.22	0.53	0.00	0.76
64	0.28	0.17	0.00	0.45	0.18	0.19	0.00	0.37	0.41	0.54	0.00	0.95
66	0.10	0.02	0.00	0.12	0.22	0.14	0.00	0.37	0.34	0.39	0.00	0.72
68	0.06	0.15	0.00	0.21	0.12	0.05	0.00	0.17	0.17	0.41	0.00	0.58
70	0.10	0.04	0.00	0.14	0.05	0.02	0.00	0.08	0.19	0.22	0.00	0.41
72	0.06	0.08	0.00	0.14	0.06	0.00	0.00	0.06	0.08	0.13	0.00	0.21
74	0.06	0.02	0.00	0.09	0.00	0.00	0.00	0.00	0.09	0.07	0.00	0.16
76	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.08	0.05	0.00	0.13
78	0.05	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
80	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02
82	0.00	0.02	0.00	0.02	0.08	0.00	0.00	0.08	0.00	0.00	0.00	0.00
84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	5.66	6.35	0.00	12.01	3.44	2.56	0.00	5.99	3.61	4.66	0.00	8.27
Nº samples:				26				18				42
Nº Ind.:	197	226	0	423	170	135	0	305	312	420	0	732
Sampled catch:				648				617				1832
Range:				11-89				14-83				13-81
Total catch:				654				682				1832
Total hauls:				40				58				101

TABLE 23.- Thorny skate length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2007-2009 (R/V *Vizconde de Eza*). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2007				2008				2009			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.16	0.08	0.00	0.24	0.09	0.11	0.00	0.20	0.11	0.05	0.00	0.16
14	0.08	0.12	0.00	0.21	0.12	0.09	0.00	0.20	0.06	0.07	0.00	0.13
16	0.05	0.10	0.00	0.15	0.03	0.03	0.00	0.06	0.02	0.02	0.00	0.04
18	0.13	0.12	0.00	0.25	0.04	0.01	0.00	0.05	0.00	0.05	0.00	0.05
20	0.18	0.10	0.00	0.28	0.09	0.01	0.00	0.10	0.01	0.03	0.00	0.04
22	0.15	0.19	0.00	0.34	0.02	0.01	0.00	0.03	0.00	0.00	0.00	0.00
24	0.13	0.14	0.00	0.27	0.02	0.02	0.00	0.04	0.02	0.02	0.00	0.05
26	0.13	0.16	0.00	0.30	0.08	0.07	0.00	0.14	0.01	0.00	0.00	0.01
28	0.10	0.06	0.00	0.16	0.02	0.05	0.00	0.08	0.02	0.01	0.00	0.03
30	0.08	0.05	0.00	0.12	0.04	0.05	0.00	0.10	0.02	0.03	0.00	0.06
32	0.08	0.06	0.00	0.13	0.07	0.05	0.00	0.12	0.00	0.01	0.00	0.01
34	0.09	0.03	0.00	0.12	0.05	0.04	0.00	0.10	0.01	0.01	0.00	0.02
36	0.06	0.05	0.00	0.11	0.03	0.05	0.00	0.08	0.00	0.00	0.00	0.00
38	0.05	0.06	0.00	0.11	0.01	0.03	0.00	0.04	0.02	0.01	0.00	0.03
40	0.02	0.01	0.00	0.03	0.05	0.01	0.00	0.06	0.02	0.00	0.00	0.02
42	0.03	0.06	0.00	0.09	0.02	0.05	0.00	0.07	0.00	0.01	0.00	0.01
44	0.04	0.04	0.00	0.08	0.01	0.02	0.00	0.03	0.01	0.04	0.00	0.05
46	0.05	0.09	0.00	0.14	0.03	0.06	0.00	0.09	0.00	0.01	0.00	0.01
48	0.05	0.09	0.00	0.14	0.02	0.01	0.00	0.03	0.01	0.02	0.00	0.03
50	0.12	0.13	0.00	0.25	0.06	0.03	0.00	0.09	0.05	0.01	0.00	0.06
52	0.09	0.15	0.00	0.24	0.07	0.08	0.00	0.15	0.02	0.02	0.00	0.04
54	0.21	0.24	0.00	0.44	0.08	0.09	0.00	0.17	0.05	0.05	0.00	0.09
56	0.19	0.34	0.00	0.53	0.03	0.13	0.00	0.16	0.02	0.15	0.00	0.17
58	0.30	0.27	0.00	0.57	0.12	0.22	0.00	0.34	0.13	0.09	0.00	0.22
60	0.27	0.59	0.00	0.86	0.22	0.28	0.00	0.50	0.16	0.08	0.00	0.24
62	0.46	0.76	0.00	1.22	0.29	0.35	0.00	0.65	0.23	0.24	0.00	0.47
64	0.42	0.62	0.00	1.04	0.35	0.45	0.00	0.81	0.23	0.14	0.00	0.36
66	0.34	0.54	0.00	0.88	0.39	0.45	0.00	0.84	0.25	0.18	0.00	0.43
68	0.37	0.64	0.00	1.02	0.32	0.44	0.00	0.76	0.28	0.18	0.00	0.47
70	0.25	0.38	0.00	0.62	0.25	0.37	0.00	0.62	0.19	0.07	0.00	0.26
72	0.18	0.24	0.00	0.43	0.19	0.15	0.00	0.34	0.17	0.09	0.00	0.25
74	0.12	0.13	0.00	0.25	0.26	0.16	0.00	0.42	0.19	0.01	0.00	0.20
76	0.04	0.05	0.00	0.10	0.10	0.13	0.00	0.23	0.02	0.03	0.00	0.06
78	0.03	0.03	0.00	0.06	0.09	0.03	0.00	0.12	0.04	0.03	0.00	0.07
80	0.01	0.00	0.00	0.01	0.07	0.00	0.00	0.07	0.01	0.00	0.00	0.01
82	0.01	0.00	0.00	0.01	0.05	0.02	0.00	0.07	0.01	0.00	0.00	0.01
84	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.03	0.00	0.00	0.00	0.00
86	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00
88	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Total	5.10	6.71	0.00	11.81	3.85	4.18	0.00	8.03	2.41	1.76	0.00	4.17
Nº samples:				43				39				44
Nº Ind.:	457	621	0	1078	344	378	0	722	211	156	0	367
Sampled catch:				2325				1931.6				996.2
Range:				12-82				12-89				12-82
Total catch:				2325				1931.6				996.2
Total hauls:				99				103				103

TABLE 24.- Swept area, number of hauls and **black dogfish** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2009, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

Stratum	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
				2003 (*)				**2004**				**2006**
385	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0229	2	0.000	0.000
387	0.0229	2	0.000	0.000	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000
388	0.0334	3	0.000	0.000	0.0105	1	0.000	-	0.0566	5	0.000	0.000
389	0.0454	4	0.000	0.000	0.0225	2	0.000	0.000	0.0795	7	0.000	0.000
390	0.0563	5	0.000	0.000	0.0345	3	0.000	0.000	0.1249	11	0.000	0.000
391	0.0338	3	0.000	0.000	0.0218	2	0.000	0.000	0.0450	4	0.000	0.000
392	0.0116	1	0.000	-	0.0214	2	0.000	0.000	0.0229	2	0.000	0.000
729	0.0210	2	0.000	0.000	0.0221	2	0.000	0.000	0.0338	3	0.000	0.000
730	0.0221	2	0.000	0.000	0.0221	2	2.175	3.076	0.0326	3	3.690	6.391
731	0.0229	2	0.000	0.000	0.0233	2	0.000	0.000	0.0341	3	0.000	0.000
732	0.0113	1	0.000	-	0.0210	2	0.000	0.000	0.0334	3	0.000	0.000
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	0.000	0.000	0.0454	4	0.000	0.000
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	0.000	0.000	0.0225	2	0.000	0.000
741	0.0113	1	0	-	0.0323	3	0.000	0.000	0.0218	2	0.000	0.000
742	0.0116	1	0	-	0.0120	1	0.000	-	0.0229	2	0.000	0.000
743	n.s.	n.s.	n.s.	n.s.	0.0188	2	0.626	0.862	0.0225	2	0.000	0.000
744	n.s.	n.s.	n.s.	n.s.	0.0101	1	0.000	-	0.0229	2	0.725	1.025
745	0.034	3	0.007	0.012	0.0319	3	0.000	0.000	0.0686	6	0.000	0.000
746	0.0446	4	0	0	0.0338	3	0.000	0.000	0.0675	6	9.033	10.572
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	4.067	3.591	0.1230	11	3.656	2.707
748	0.0109	1	0	-	0.0199	2	36.980	52.298	0.0326	3	15.713	18.383
749	0.022	2	219.750	310.773	0.0221	2	17.300	5.515	0.0229	2	91.125	124.599
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	2.800	3.960	0.1005	9	6.213	9.605
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0454	4	1.103	1.497
				2007				**2008**				**2009**
385	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000
387	0.0225	2	0.000	0.000	0.0435	4	0.000	0.000	0.0439	4	0.000	0.000
388	0.0563	5	0.000	0.000	0.0559	5	0.000	0.000	0.0555	5	0.000	0.000
389	0.0900	8	0.000	0.000	0.0780	7	0.000	0.000	0.0803	7	0.000	0.000
390	0.1350	12	0.000	0.000	0.1395	12	0.000	0.000	0.1373	12	0.000	0.000
391	0.0450	4	0.000	0.000	0.0454	4	0.000	0.000	0.0458	4	0.000	0.000
392	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0229	2	0.000	0.000
729	0.0338	3	0.000	0.000	0.0338	3	0.000	0.000	0.0341	3	0.000	0.000
730	0.0225	2	19.488	26.067	0.0323	3	27.367	47.400	0.0338	3	30.959	51.654
731	0.0338	3	0.000	0.000	0.0330	3	0.000	0.000	0.0341	3	0.000	0.000
732	0.0338	3	0.000	0.000	0.0446	4	0.000	0.000	0.0450	4	0.000	0.000
733	0.0338	3	0.000	0.000	0.0431	4	0.000	0.000	0.0450	4	0.000	0.000
734	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0218	2	0.000	0.000
741	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0221	2	0.000	0.000
742	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0214	2	0.000	0.000
743	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000	0.0203	2	1.835	1.082
744	0.0218	2	1.663	0.541	0.0221	2	0.880	0.198	0.0210	2	0.430	0.608
745	0.0675	6	0.000	0.000	0.0555	5	0.000	0.000	0.0559	5	0.000	0.000
746	0.0664	6	9.171	6.742	0.0638	6	6.142	1.917	0.0668	6	3.939	5.074
747	0.1238	11	6.015	5.815	0.1069	10	5.894	5.184	0.1118	10	6.653	4.933
748	0.0338	3	35.817	40.266	0.0218	2	80.800	114.268	0.0229	2	12.240	17.310
749	0.0113	1	229.700	-	0.0214	2	35.410	19.827	0.0225	2	131.090	156.143
750	0.0679	6	13.979	28.671	0.0844	8	12.366	21.347	0.0791	7	9.146	7.225
751	0.0225	2	4.405	0.191	0.0413	4	3.780	2.765	0.0338	3	5.343	4.636

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

TABLE 25.- Stratified mean catches (Kg) and SD of **black dogfish** by stratum and year (2003-2009). Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2009.

	Survey						
Stratum	2003	2004	2005	2006	2007	2008	2009
385	0.00	0.00	-	0.00	0.00	0.00	0.00
387	0.00	0.00	-	0.00	0.00	0.00	0.00
388	0.00	0.00	-	0.00	0.00	0.00	0.00
389	0.00	0.00	-	0.00	0.00	0.00	0.00
390	0.00	0.00	-	0.00	0.00	0.00	0.00
391	0.00	0.00	-	0.00	0.00	0.00	0.00
392	0.00	0.00	-	0.00	0.00	0.00	0.00
729	0.00	0.00	-	0.00	0.00	0.00	0.00
730	0.00	369.75	-	627.30	3312.88	4652.33	5262.97
731	0.00	0.00	-	0.00	0.00	0.00	0.00
732	0.00	0.00	-	0.00	0.00	0.00	0.00
733	n.s	0.00	-	0.00	0.00	0.00	0.00
734	n.s	0.00	-	0.00	0.00	0.00	0.00
741	0.00	0.00	-	0.00	0.00	0.00	0.00
742	0.00	0.00	-	0.00	0.00	0.00	0.00
743	n.s	31.90	-	0.00	0.00	0.00	93.59
744	n.s	0.00	-	47.85	109.73	58.08	28.38
745	2.32	0.00	-	0.00	0.00	0.00	0.00
746	0.00	0.00	-	3541.07	3594.84	2407.60	1544.22
747	n.s	2944.27	-	2646.94	4354.53	4267.26	4816.77
748	0.00	5879.82	-	2498.42	5694.85	12847.20	1946.16
749	27688.50	2179.80	-	11481.75	28942.20	4461.66	16517.34
750	n.s	1556.80	-	3454.61	7772.42	6875.64	5085.02
751	n.s	n.s	-	252.47	1008.75	865.62	1223.62
TOTAL	27690.82	12962.34		24550.42	54790.18	36435.38	36518.07
	6.19	2.07		3.78	8.45	5.62	5.63
$(\bar{y})$ SD	6.19	1.01		1.78	1.28	2.23	2.33

TABLE 26.- Survey estimates (by the swept area method) of **black dogfish** biomass (t.) and SD by stratum and year on NAFO Div. 3L (R/V *Vizconde de Eza*). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	Survey						
Stratum	2003	2004	2005	2006	2007	2008	2009
385	0	0	-	0	0	0	0
387	0	0	-	0	0	0	0
388	0	0	-	0	0	0	0
389	0	0	-	0	0	0	0
390	0	0	-	0	0	0	0
391	0	0	-	0	0	0	0
392	0	0	-	0	0	0	0
729	0	0	-	0	0	0	0
730	0	33	-	58	294	433	468
731	0	0	-	0	0	0	0
732	0	0	-	0	0	0	0
733	n.s	0	-	0	0	0	0
734	n.s	0	-	0	0	0	0
741	0	0	-	0	0	0	0
742	0	0	-	0	0	0	0
743	n.s	3	-	0	0	0	9
744	n.s	0	-	4	10	5	3
745	0	0	-	0	0	0	0
746	0	0	-	315	325	227	139
747	n.s	287	-	237	387	399	431
748	0	592	-	230	506	1181	170
749	2503	197	-	1004	2573	417	1468
750	n.s	173	-	309	687	652	450
751	n.s	n.s	-	22	90	84	109
TOTAL	2503	1286		2179	4872	3399	3247
SD	2546	695		994	721	1296	1340

TABLE 27.- Black dogfish length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2006 (R/V *Vizconde de Eza*). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2003 (*)				2004				2006			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
42	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01	0.01	0.00	0.02
44	0.00	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.05
46	0.00	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.04
48	0.03	0.06	0.00	0.08	0.01	0.02	0.00	0.04	0.05	0.02	0.00	0.06
50	0.08	0.08	0.00	0.17	0.03	0.06	0.00	0.08	0.00	0.03	0.00	0.03
52	0.20	0.22	0.00	0.42	0.04	0.07	0.00	0.10	0.03	0.06	0.00	0.10
54	0.20	0.31	0.00	0.51	0.06	0.05	0.00	0.11	0.04	0.06	0.00	0.09
56	0.34	0.59	0.00	0.93	0.02	0.12	0.00	0.14	0.04	0.06	0.00	0.11
58	0.28	0.48	0.00	0.76	0.13	0.06	0.00	0.19	0.08	0.12	0.00	0.20
60	0.39	0.39	0.00	0.79	0.11	0.19	0.00	0.30	0.15	0.15	0.00	0.29
62	0.20	0.28	0.00	0.48	0.08	0.15	0.00	0.23	0.11	0.23	0.00	0.35
64	0.34	0.28	0.00	0.62	0.09	0.00	0.00	0.10	0.17	0.19	0.00	0.35
66	0.20	0.25	0.00	0.45	0.13	0.10	0.00	0.23	0.14	0.18	0.00	0.32
68	0.03	0.08	0.00	0.11	0.01	0.07	0.00	0.08	0.07	0.14	0.00	0.21
70	0.00	0.06	0.00	0.06	0.04	0.07	0.00	0.11	0.01	0.15	0.00	0.16
72	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.01	0.01	0.15	0.00	0.16
74	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.11	0.00	0.11
76	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.03
78	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02
80	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02
82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
84	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total	2.27	3.31	0.00	5.59	0.78	1.01	0.00	1.79	0.94	1.77	0.00	2.71
Nº samples:				1				8				28
Nº Ind.:	81	118	0	199	58	55	0	113	99	184	0	283
Sampled catch:				440				127				397
Range:				44-79				17-75				41-84
Total catch:				440				132				397
Total hauls:				40				58				101

TABLE 28.- Black dogfish length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2007-2009 (R/V *Vizconde de Eza*). (I) means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

	2007				2008				2009			
Lenght (cm.)	M	F	I	T	M	F	I	T	M	F	I	T
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
40	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01
42	0.00	0.03	0.00	0.03	0.02	0.00	0.00	0.02	0.01	0.04	0.00	0.05
44	0.02	0.00	0.00	0.02	0.01	0.04	0.00	0.05	0.04	0.03	0.00	0.07
46	0.01	0.04	0.00	0.04	0.04	0.06	0.00	0.09	0.01	0.02	0.00	0.03
48	0.01	0.02	0.00	0.03	0.03	0.01	0.00	0.04	0.04	0.02	0.00	0.06
50	0.03	0.09	0.00	0.12	0.07	0.03	0.00	0.10	0.03	0.08	0.00	0.11
52	0.05	0.06	0.00	0.11	0.09	0.08	0.00	0.17	0.11	0.10	0.00	0.21
54	0.11	0.18	0.00	0.28	0.18	0.10	0.00	0.28	0.13	0.10	0.00	0.23
56	0.11	0.14	0.00	0.25	0.19	0.12	0.00	0.30	0.18	0.15	0.00	0.33
58	0.28	0.36	0.00	0.64	0.28	0.15	0.00	0.43	0.19	0.17	0.00	0.37
60	0.45	0.22	0.00	0.68	0.55	0.16	0.00	0.71	0.28	0.20	0.00	0.49
62	0.65	0.45	0.00	1.10	0.63	0.12	0.00	0.75	0.29	0.19	0.00	0.48
64	0.38	0.39	0.00	0.77	0.58	0.13	0.00	0.72	0.18	0.20	0.00	0.38
66	0.23	0.29	0.00	0.51	0.17	0.17	0.00	0.34	0.04	0.31	0.00	0.35
68	0.13	0.25	0.00	0.38	0.08	0.10	0.00	0.18	0.05	0.19	0.00	0.25
70	0.05	0.24	0.00	0.29	0.01	0.12	0.00	0.13	0.00	0.22	0.00	0.22
72	0.00	0.24	0.00	0.24	0.02	0.02	0.00	0.04	0.00	0.17	0.00	0.17
74	0.00	0.21	0.00	0.21	0.00	0.08	0.00	0.08	0.00	0.14	0.00	0.14
76	0.00	0.10	0.00	0.10	0.00	0.07	0.00	0.07	0.00	0.08	0.00	0.08
78	0.00	0.06	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
80	0.00	0.04	0.00	0.04	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
82	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
84	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
Total	2.51	3.41	0.00	5.92	2.95	1.59	0.00	4.53	1.58	2.46	0.00	4.04
Nº samples:				28				30				32
Nº Ind.:	179	245	0	424	269	152	0	421	157	234	0	391
Sampled catch:				593				526				554
Range:				41-81				41-85				41-89
Total catch:				593				526				554
Total hauls:				99				103				103

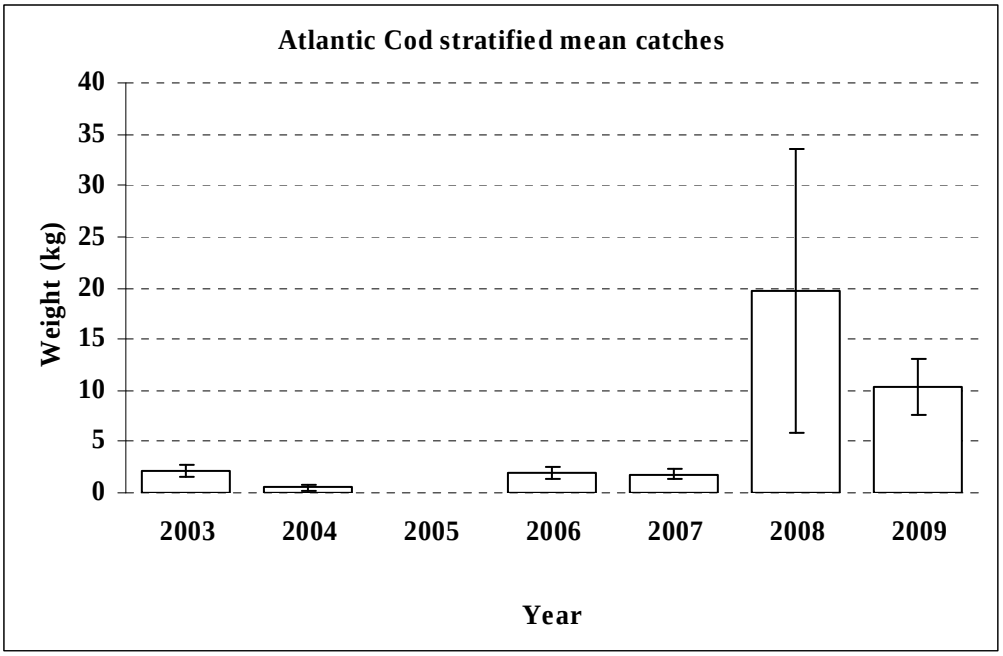


FIGURE 1.- Atlantic cod stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2009 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

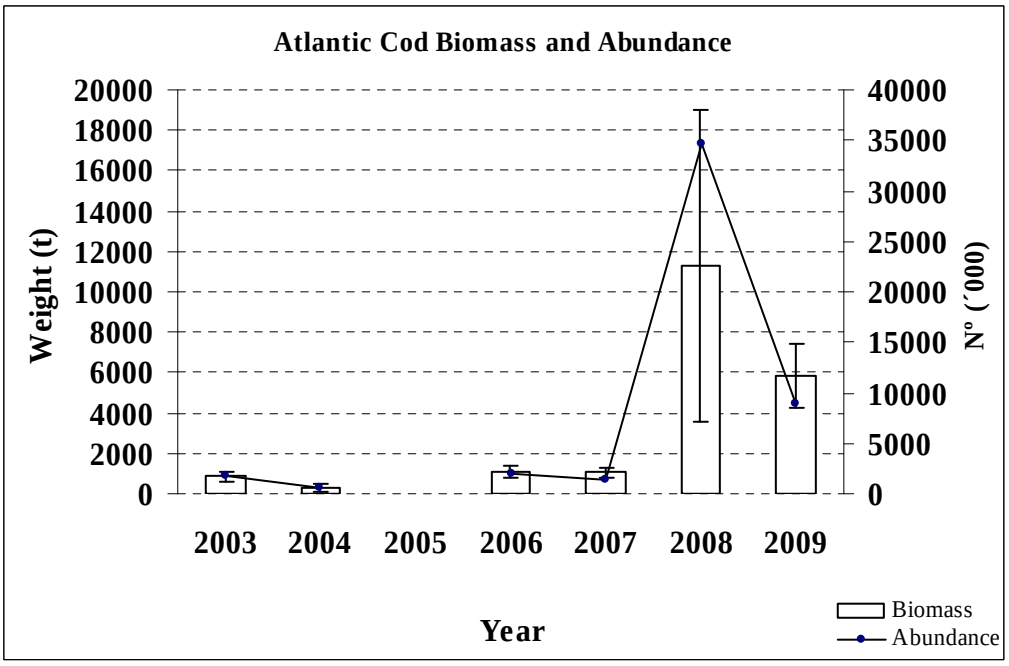


FIGURE 2.- Atlantic cod abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2009 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

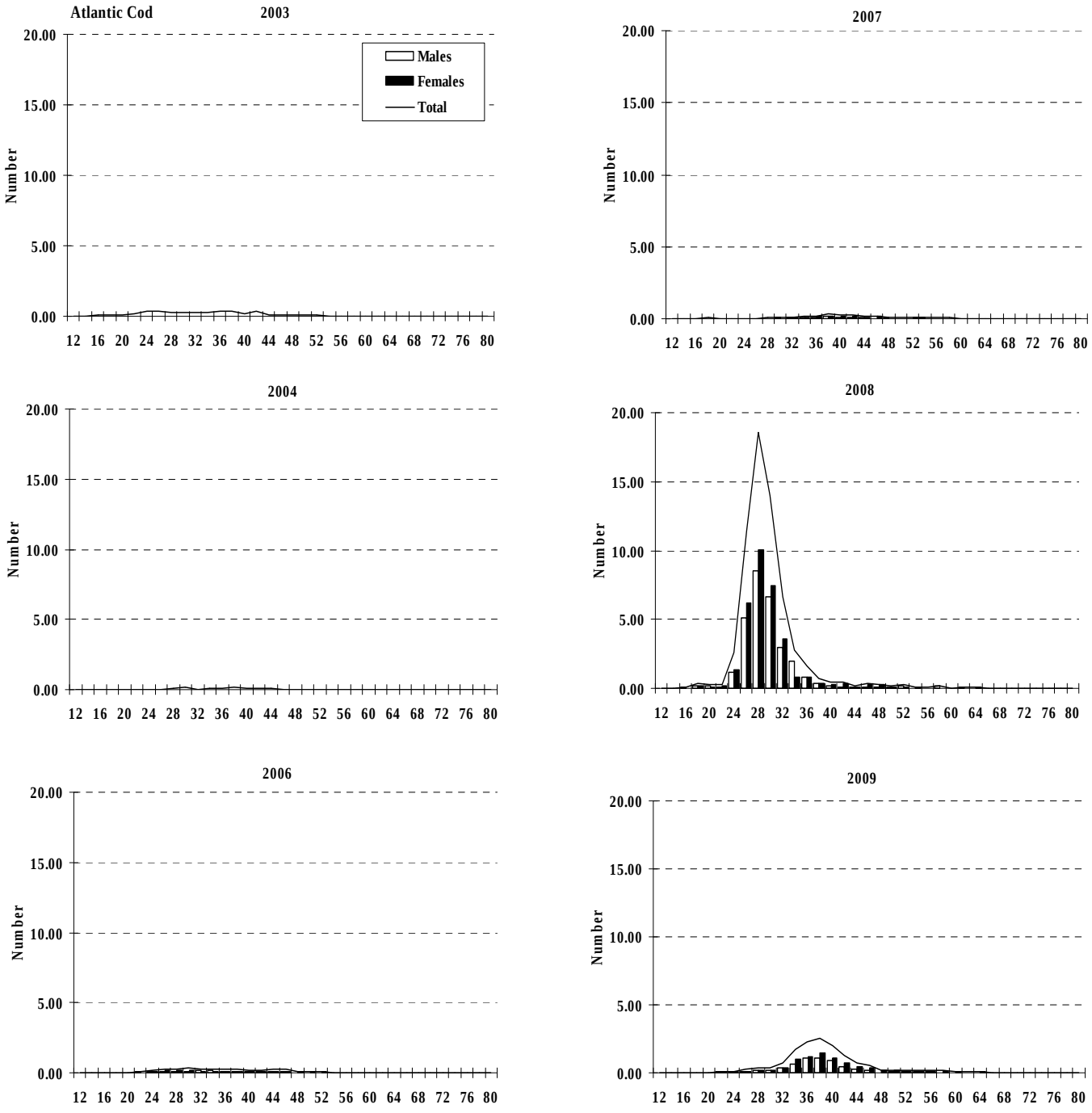
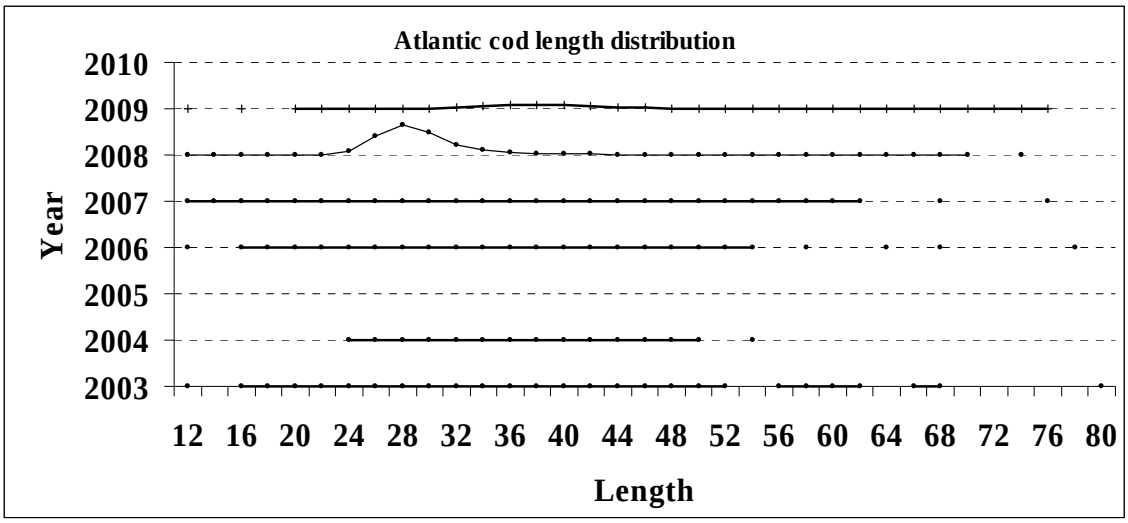
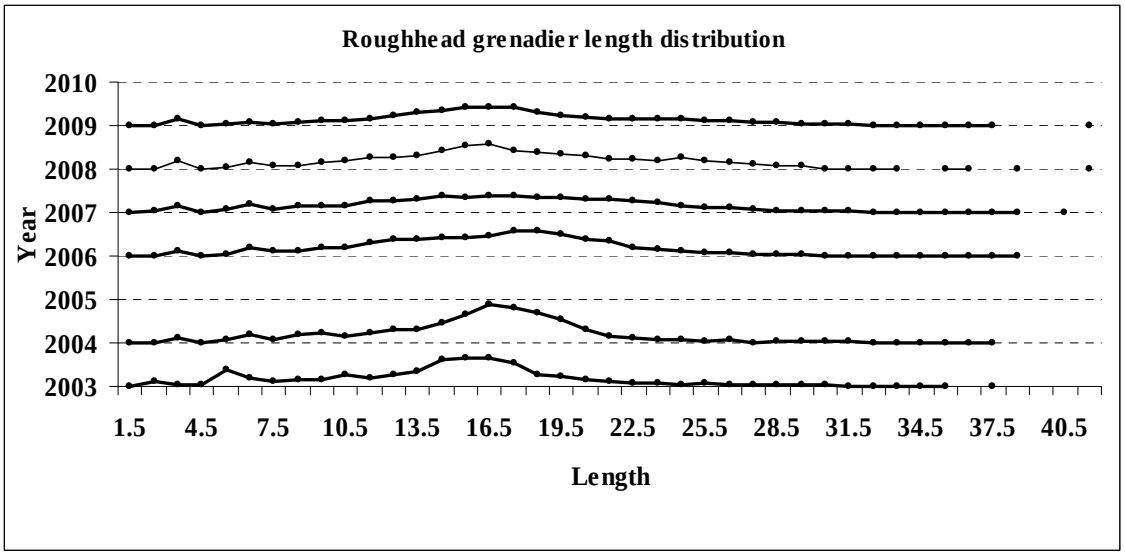


FIGURE 3.- Atlantic cod length distribution (cm) in NAFO 3L: 2003-2009. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.





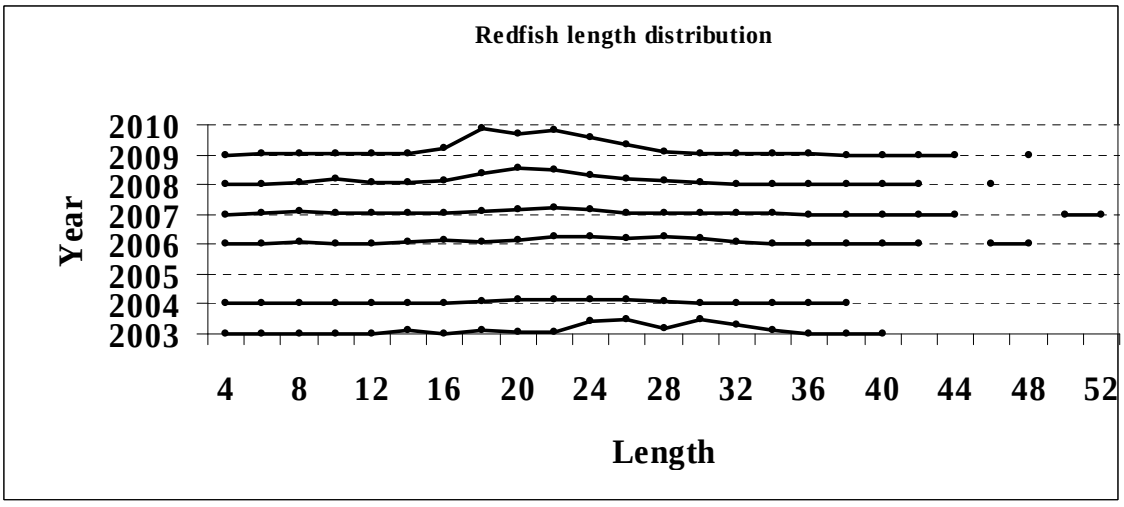


FIGURE 4.- Atlantic cod, **Roughhead grenadier** and **redfish** length distribution (cm) in NAFO 3L: 2003-2009.

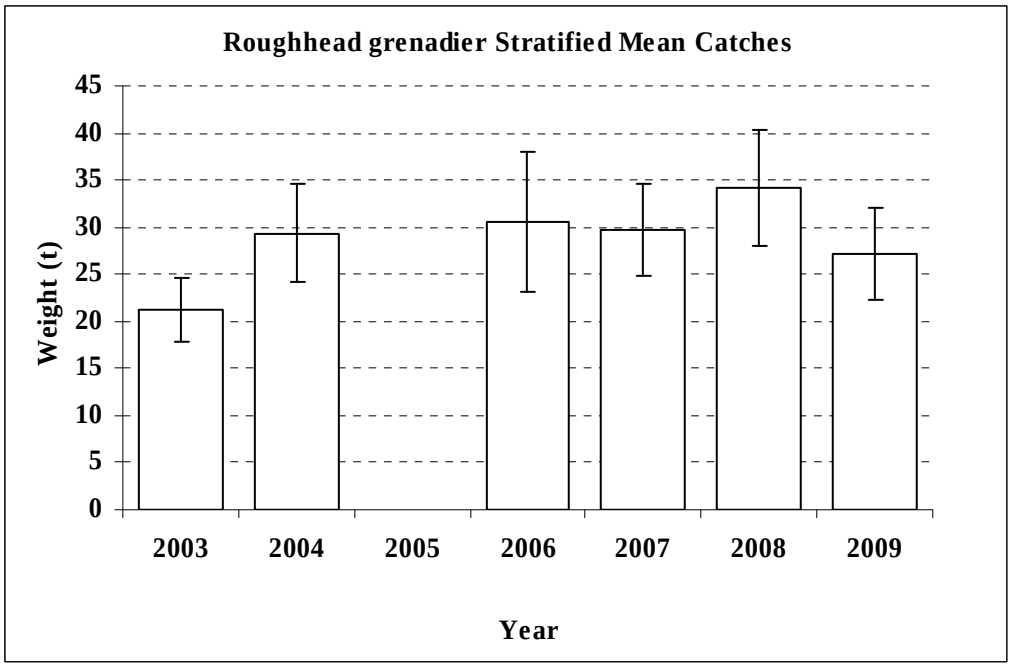


FIGURE 5.- Roughhead grenadier stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2009 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009

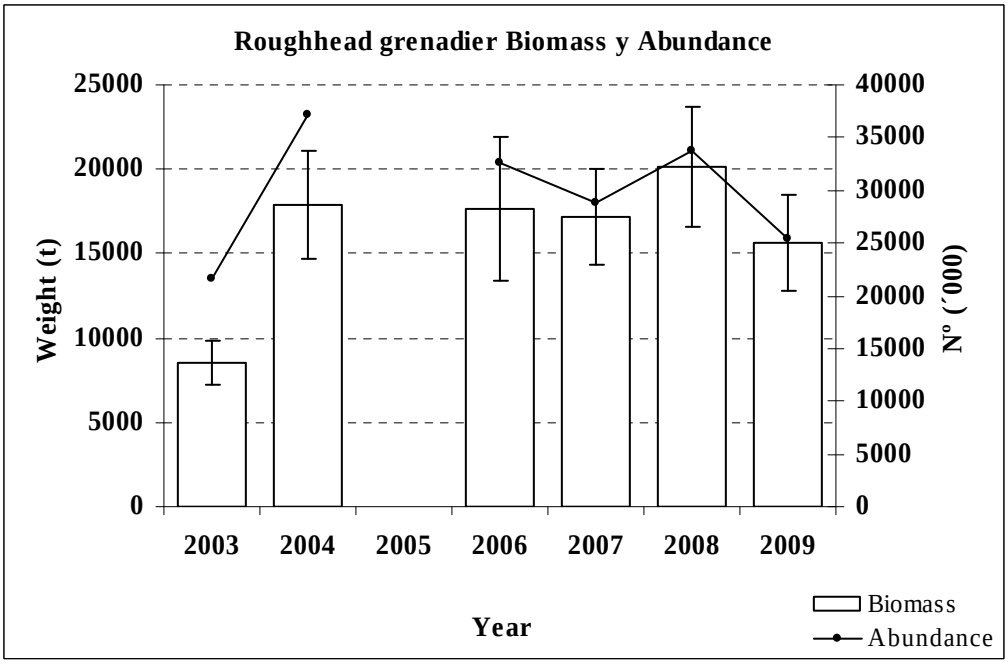


FIGURE 6.- Roughhead grenadier abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2009 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

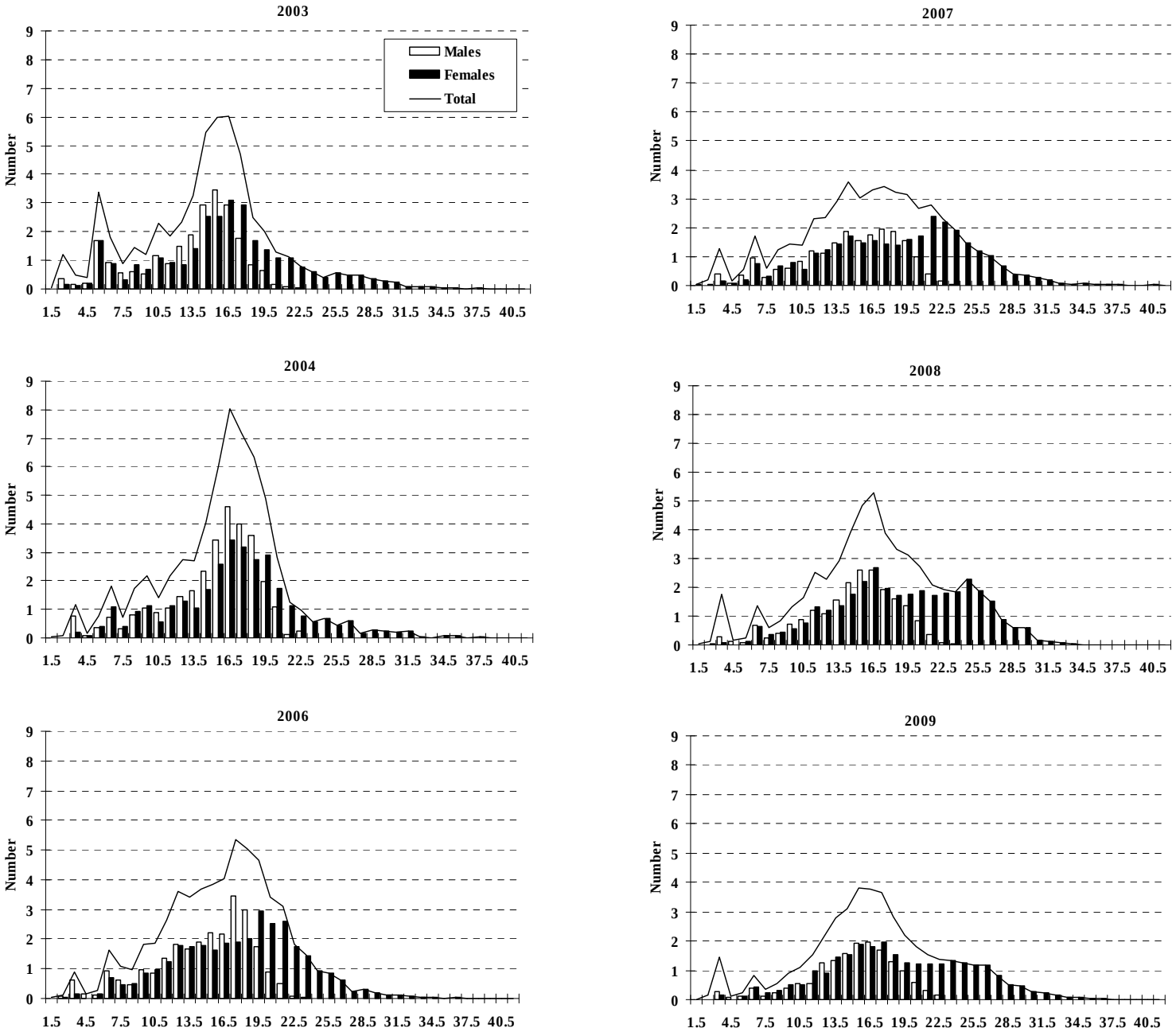


FIGURE 7.- Roughhead grenadier length distribution (cm) in NAFO 3L: 2003-2009. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

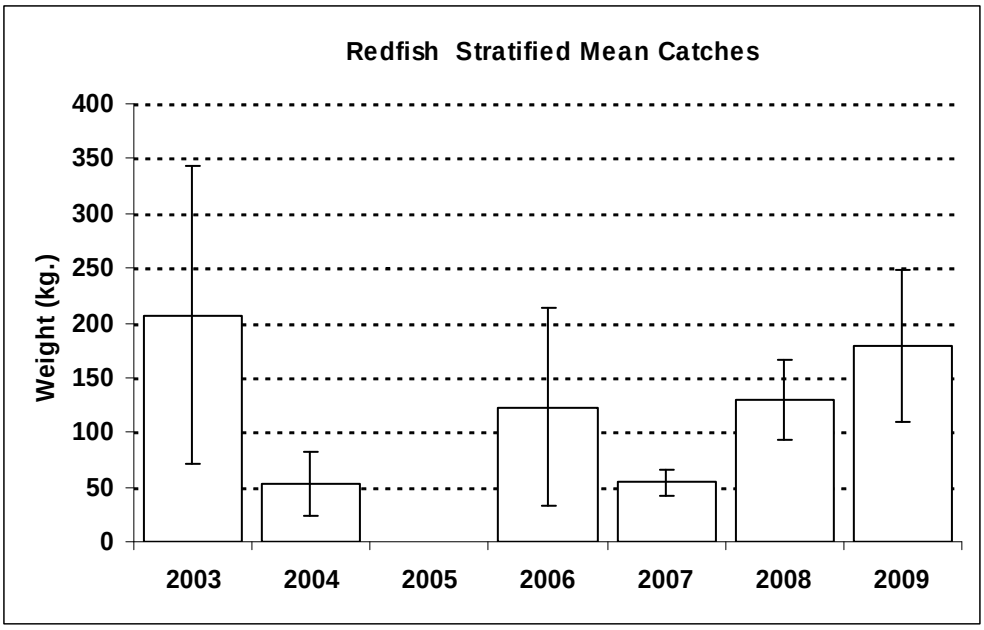


FIGURE 8.- Redfish stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2009 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

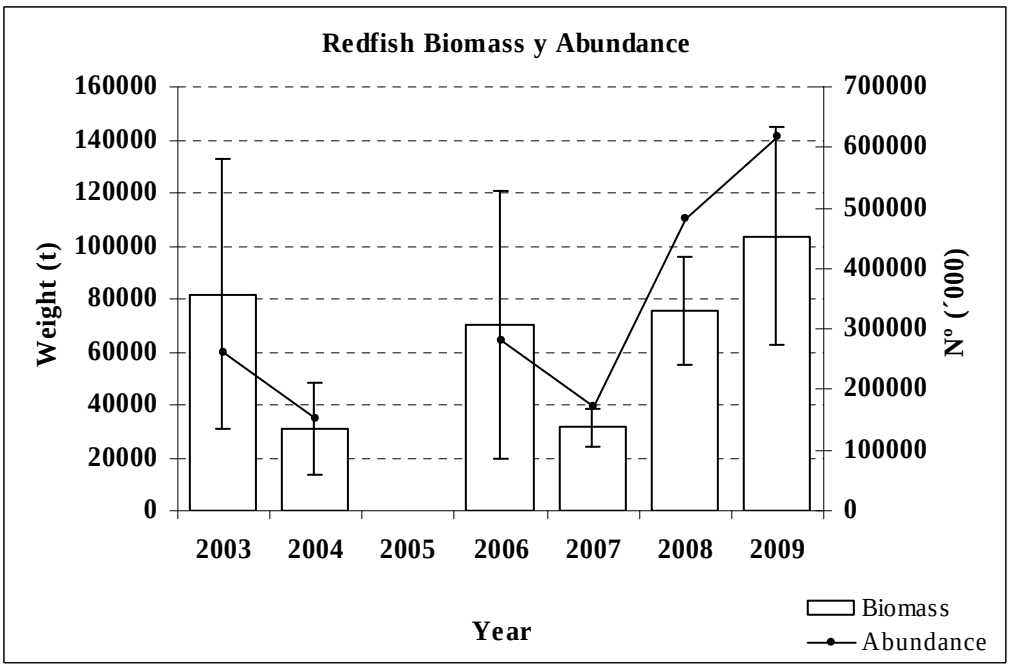


FIGURE 9.- Redfish abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2009 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

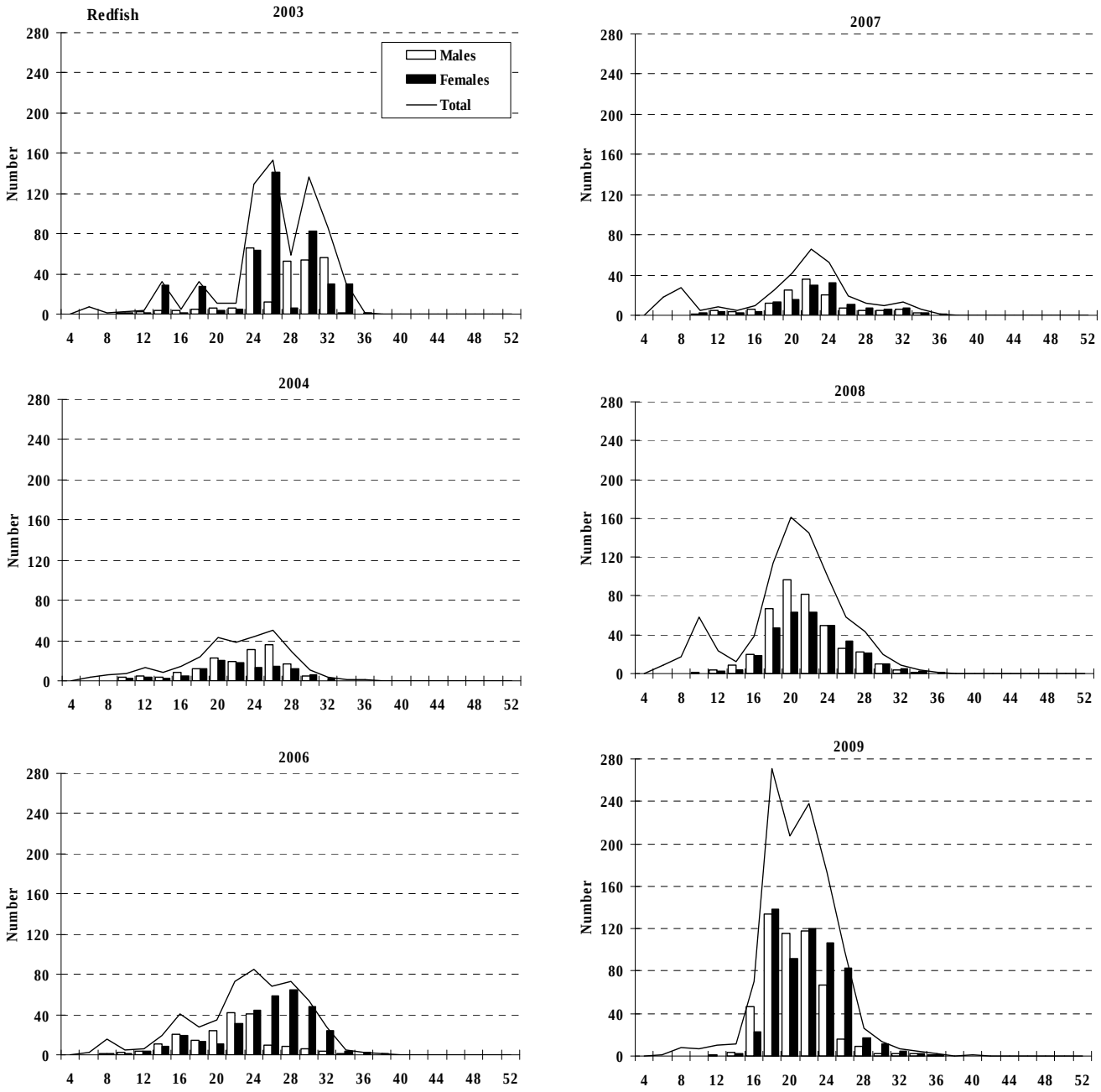


FIGURE 10.- Redfish length distribution (cm) in NAFO 3L: 2003-2009. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

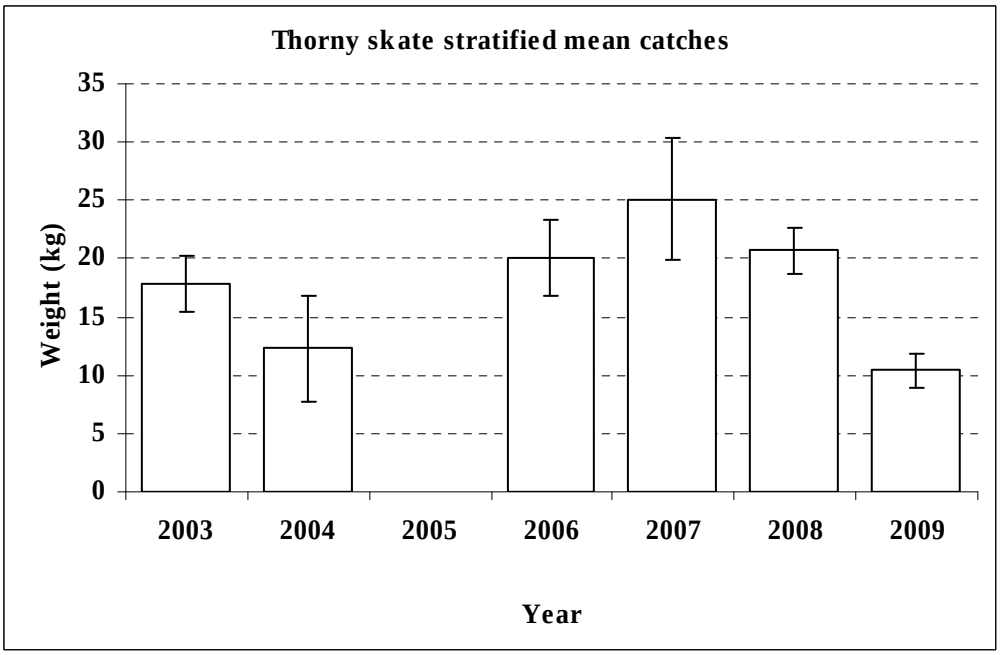


FIGURE 11.- Thorny skate stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

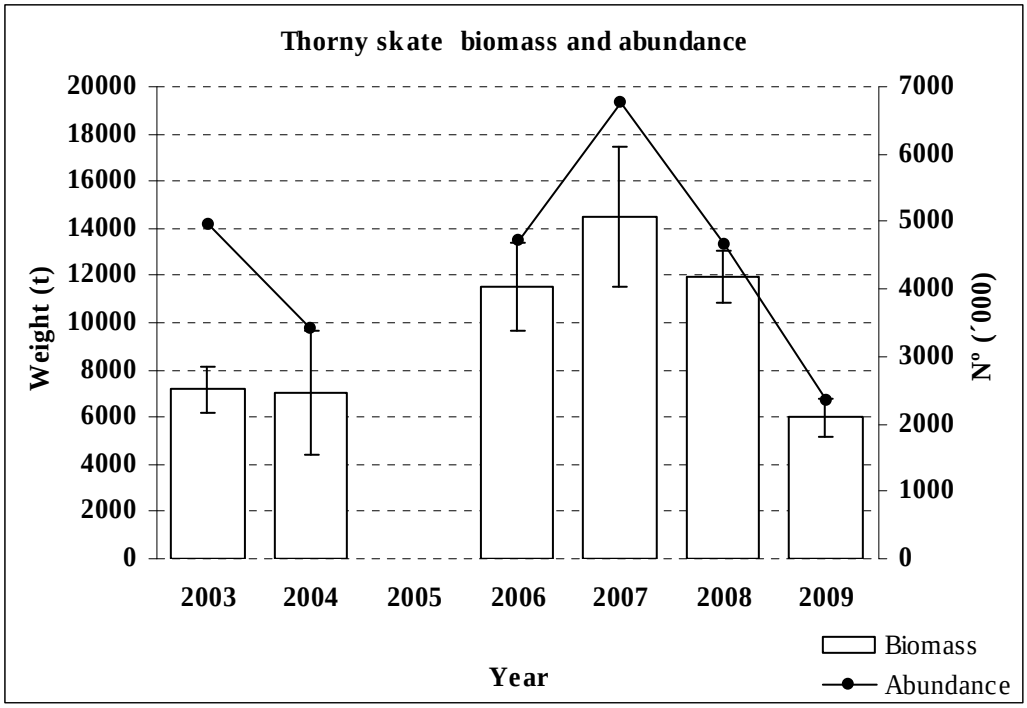


FIGURE 12.- Thorny skate abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2009 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

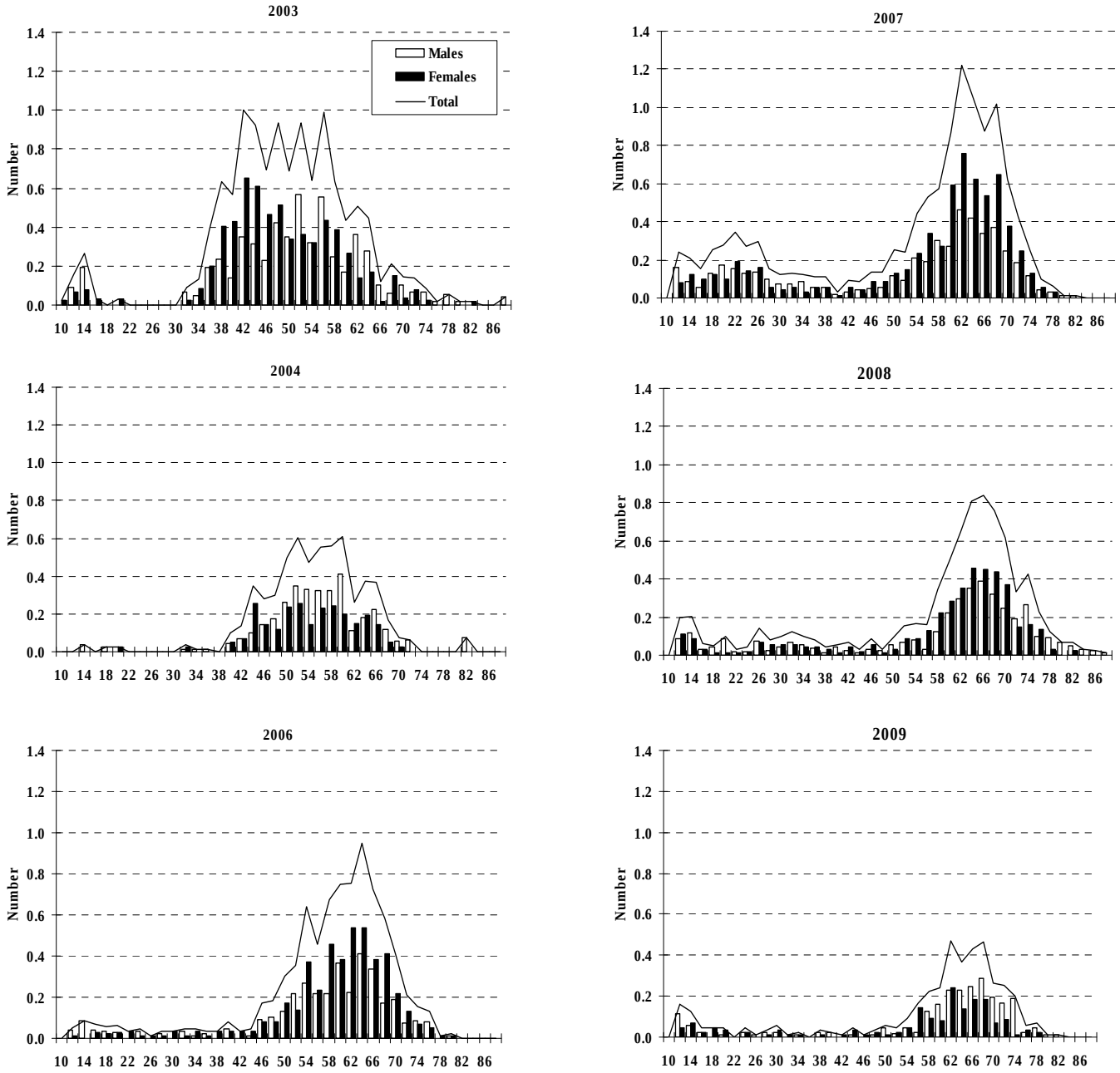
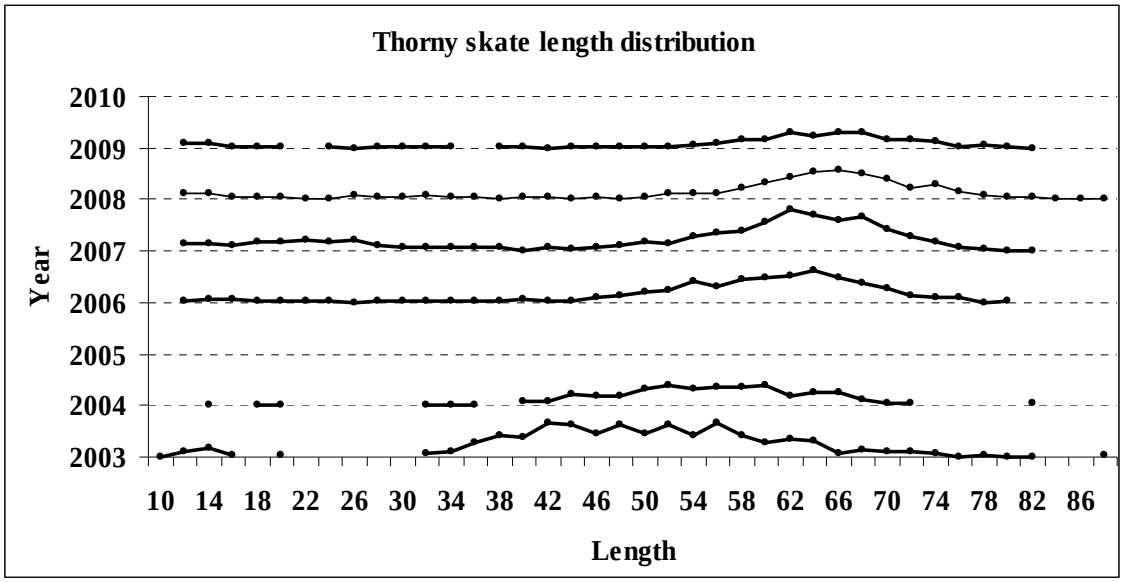


FIGURE 13.- Thorny skate length distribution (cm) in NAFO 3L: 2003-2009. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.



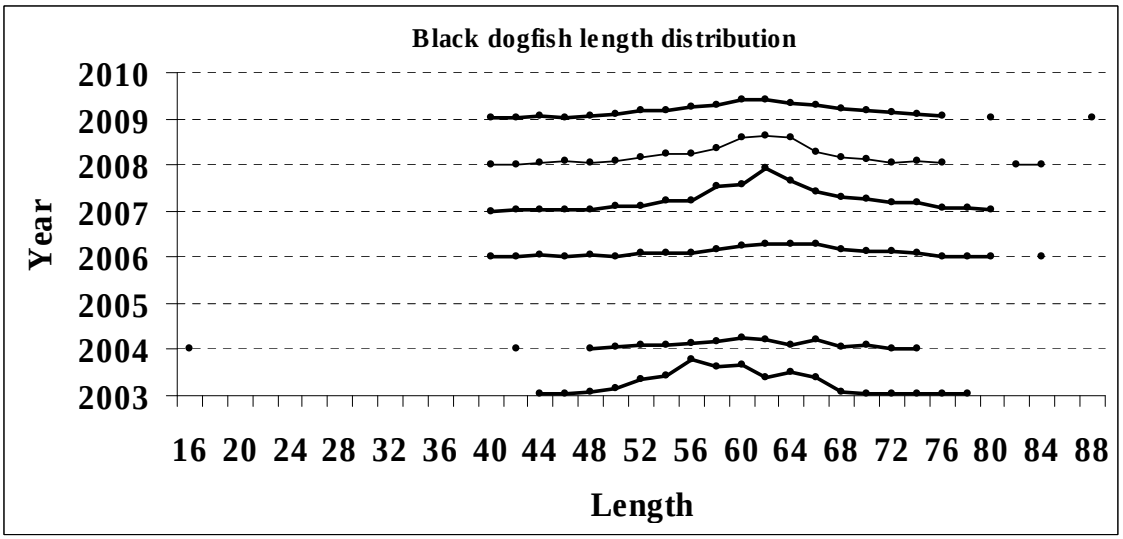


FIGURE 14.- Thorny skate and **black length** distribution (cm) in NAFO 3L: 2003-2009.

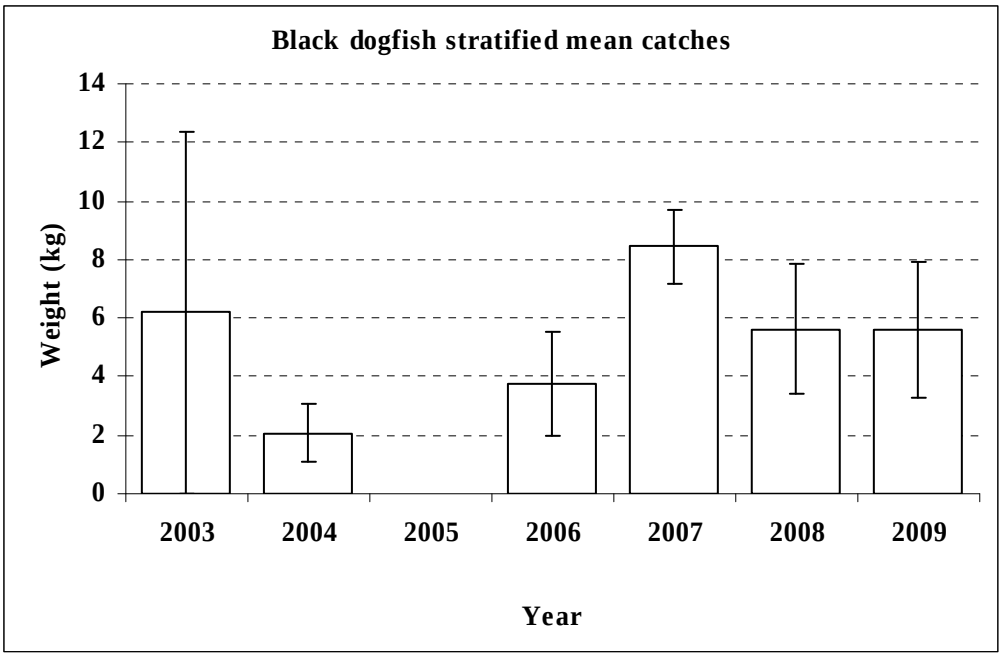


FIGURE 15.- Black dogfish stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2009 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

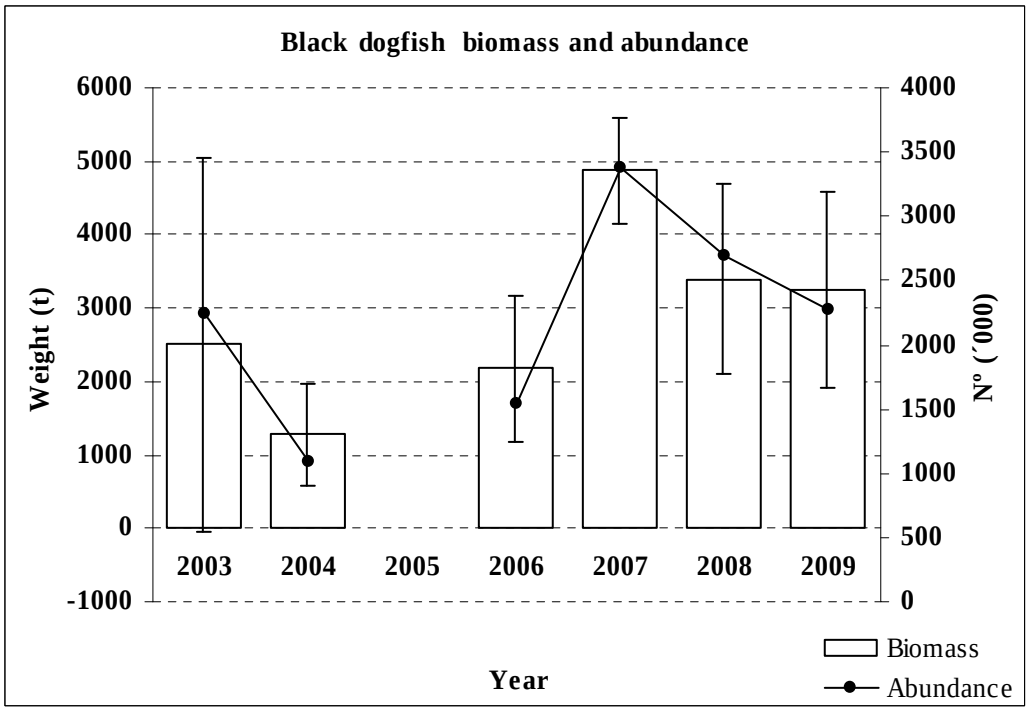


FIGURE 16.- Black dogfish abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2009 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2009.

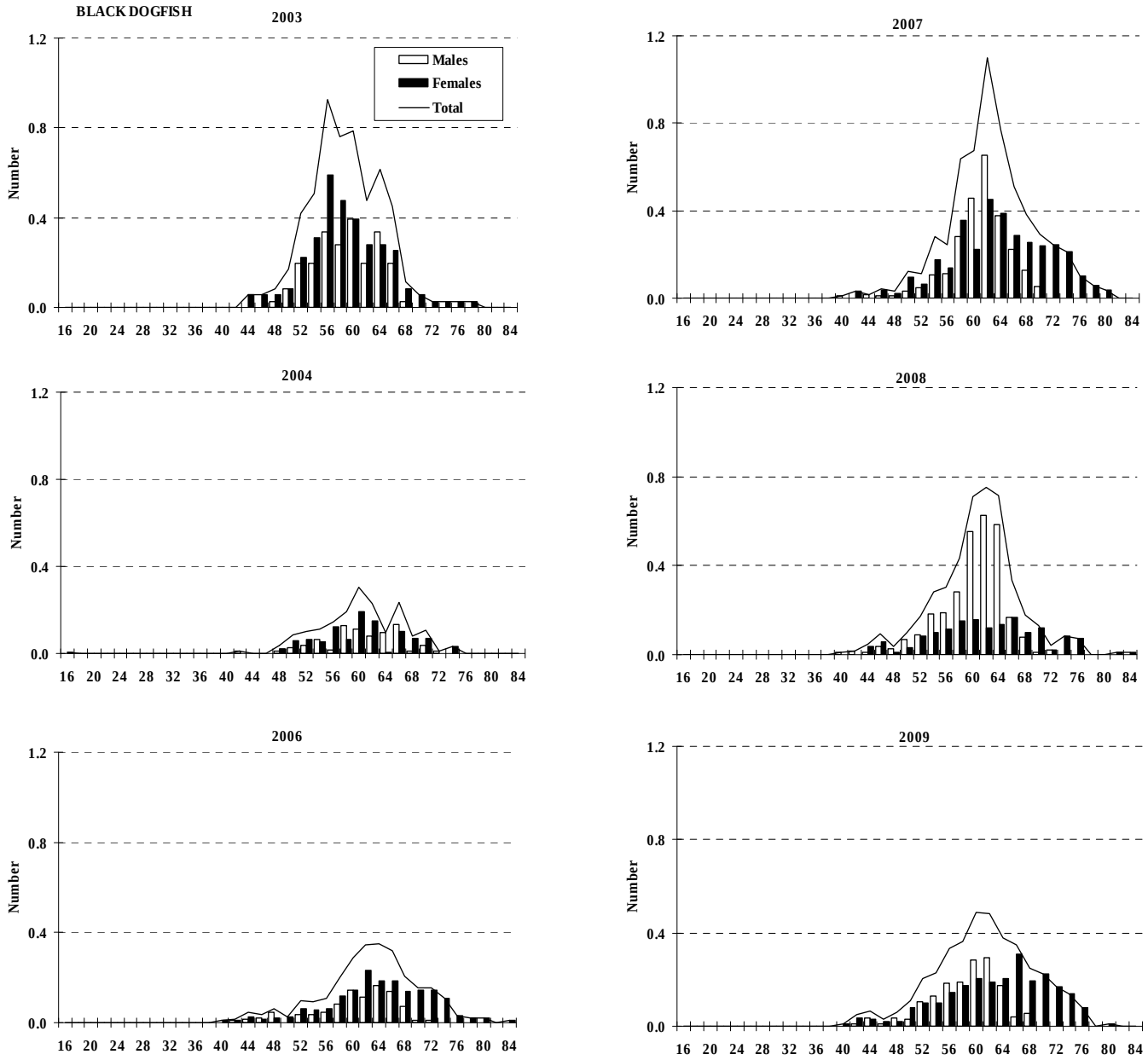


FIGURE 17.- Black dogfish length distribution (cm) in NAFO 3L: 2003-2009. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2009.