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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 2003-2008

by

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Abstract

Since 2003, a stratified random spring bottom trawl survey in the NAFO Regulatory Area of Division 3L (Flemish Pass) was conducted by Spain. 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 2003-2008.

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 2006-2008). 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*., 2009.

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.

We present the mean catch per haul, the stratified mean catch per haul and the biomass with their variance per year in the period 2003-2008. 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. All stocks remain at a very low level (NAFO, 2008).

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. 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; and in 2008 a new high increase is shown. We can see a great variation in the cod indices, but this is due to a few hauls in which the presence of cod was very high. The highest values in the estimated biomass have been observed in the shallow strata, in a range of depth from 185 to 366 meters.

Length distribution

Table 6 presents the stratified mean catches per haul length distribution 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 met, 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 in 2003, 2006 and 2007. In 2004 there is no presence of individuals below 24 cm. In 2008 we have a good presence of individuals between 26 and 33 cm, probably due to the haul with great catch of this year. In 2008, 29 cm is the mode in the length distribution.

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 catches decreased in 2004, and further in 2005 and 2006 (NAFO, 2008).

Mean catches and biomass

Roughhead grenadier haul mean catches by stratum are presented in Table 7; swept area, number of hauls and SD are shown in this table too. Stratified mean catches per tow by stratum and year and their variance are presented in Table 8. The entire time series (2003-2008) of biomass and their SD estimates of roughhead grenadier are shown in Table 9 and length-weight relationships are shown in Table 5.

Roughhead grenadier indices remain stable with a slight increase in the last year. Biomass presents the same trend as mean catches since the year 2004 (Fig. 5 and 6).

Length distribution

Table 10 presents 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.

In the period 2003-2007 it can be seen a slight recruitment. 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). Catches are usually reported by genus only (Sebastes spp.). In its regulations, NAFO also does not differentiate between species; it manages redfish stocks in 3LN, 3M, 3O, as well as Subarea 2 and Div. 1F+3K. The redfish species are very similar in appearance and are reported collectively. Catches are reported by genus only (*Sebastes spp*.). 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, 2008).

Mean catches and biomass

Table 11 shows the swept area, the tow number, the mean catches and their variance per haul and year for redfish. Table 12 and Figure 8 present the stratified mean catches per stratum with the total variance per year.

Table 13 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 show no clear trend along the time; biomass indices decreased in 2004 and 2007 and increased in 2006 and 2008. The length-weight relationships are presented in Table 5.

Length distribution

Table 14 presents the stratified mean catches per haul length distribution, 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 shown too. 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 biomass has remained relatively constant since the mid-1990s to 2005. Since then the catches have declined (NAFO, 2008).

Mean catches and biomass

Table 15 shows the swept area, the tow number, the mean catches and their variance per haul and year for thorny skate. Table 16 presents the length-weight relationships. Table 17 and Figure 11 present the stratified mean catches per stratum with the total variance per year. Table 18 and Figure 12 present the biomass per swept area per stratum and their total variance per year. Thorny skate indices decreased since 2003 until 2004, increased for 2006-2007 and decreased again in 2008.

Length distribution

Table 19 presents the stratified mean catches per haul length distribution for this specie, by sex and year, with the number of samples in which there was length measures, the total number of individuals measured in these samples, the sampled catch and the range of lengths met, as the total catch of this species and the total hauls made in the survey. In Figures 13 and 14 we can follow the evolution along the years.

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 20, including swept area, number of hauls and SD. Stratified mean catches per tow by stratum and year and their variance are presented in Table 21. The entire time series (2003-2008) of biomass and their SD estimates of black dogfish are shown in Table 22. Length-weight relationships are presented in Table 16.

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 this year (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 23 presents the stratified mean catches per haul length distribution, 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 19 and 20 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.

References

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TABLE 1.- Spanish bottom trawl surveys in NAFO Division 3L for the period 2003-2008.

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

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 2003-2008, on board R/V "*Vizconde de Eza"*. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

Stratum	2003 (*)				2004				2006				2007				2008			
	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
385	0.0225	2	0.062	0.040	0.0229	2	0.450	0.636	0.0229	2	1.783	2.521	0.0225	2	0.835	1.181	0.0229	2	6.051	6.537
387	0.0229	2	4.390	1.004	0.0214	2	1.885	1.888	0.0225	2	0.395	0.559	0.0225	2	1.992	1.105	0.0435	4	5.386	5.633
388	0.0334	3	7.870	6.987	0.0105	1	1.313	-	0.0566	5	7.028	5.142	0.0563	5	7.434	7.400	0.0559	5	18.665	19.454
389	0.0454	4	0.844	1.573	0.0225	2	0.510	0.721	0.0795	7	10.582	14.986	0.0900	8	4.162	4.621	0.0780	7	30.523	18.566
390	0.0563	5	0.000	0.000	0.0345	3	0.000	0.000	0.1249	11	0.081	0.249	0.1350	12	1.369	1.251	0.1395	12	8.682	15.848
391	0.0338	3	0.167	0.289	0.0218	2	0.000	0.000	0.0450	4	14.338	13.278	0.0450	4	11.183	15.378	0.0454	4	342.268	637.574
392	0.0116	1	0.400	-	0.0214	2	13.219	17.991	0.0229	2	2.045	1.506	0.0225	2	13.985	7.779	0.0221	2	0.000	0.000
729	0.0210	2	1.260	1.782	0.0221	2	0.000	0.000	0.0338	3	0.000	0.000	0.0338	3	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	0.0225	2	0.000	0.000	0.0323	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	0.0338	3	0.510	0.883	0.0330	3	0.130	0.225
732	0.0113	1	0.000	-	0.0210	2	0.000	0.000	0.0334	3	0.000	0.000	0.0338	3	0.000	0.000	0.0446	4	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	0.0338	3	0.427	0.739	0.0431	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	0.0225	2	0.000	0.000	0.0221	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	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000
742	0.0116	1	0.000	-	0.0120	1	0.000	-	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	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	0.0225	2	0.000	0.000	0.0203	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	0.0218	2	0.000	0.000	0.0221	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	0.0675	6	0.000	0.000	0.0555	5	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	0.0664	6	0.000	0.000	0.0638	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	0.1238	11	0.000	0.000	0.1069	10	0.000	0.000
748	0.0109	1	0.000	-	0.0199	2	0.000	0.000	0.0326	3	0.000	0.000	0.0338	3	0.000	0.000	0.0218	2	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	0.0113	1	0.000	-	0.0214	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	0.0679	6	0.000	0.000	0.0844	8	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	0.0225	2	0.000	0.000	0.0413	4	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 (2003-2008). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

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

$(\bar{y})$

TABLE 4.- Survey estimates (by the swept area method) of **Atlantic cod** biomass (t.) and SD by stratum and year in 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 2006-2008.

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

Table 5.- Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2003-2008 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	Year	Sex	L-W Equations	N	r^2	Year	Sex	L-W Equations	N	r^2
2003	All	$W = 0.0059\ L^{3.0965}$	161	0.9875	2003	All	$W = 0.0766\ L^{3.0029}$	478	0.9872	2003	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	0.9930
2004	All	$W = 0.0045\ L^{3.2037}$	58	0.9805	2004	All	$W = 0.0791\ L^{3.0113}$	1066	0.9896	2004	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	2006	All	$W = 0.0773\ L^{3.0264}$	1645	0.9817	2006	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	0.9860		Females	$W = 0.0091\ L^{3.1221}$	471	0.9811
2007	All	$W = 0.0055\ L^{3.1370}$	225	0.9830	2007	All	$W = 0.0885\ L^{2.9691}$	1950	0.9895	2007	All	$W = 0.0080\ L^{3.1588}$	881	0.9842
	Males	$W = 0.0061\ L^{3.1114}$	107	0.9910		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	2008	All	$W = 0.1237\ L^{2.8681}$	1773	0.9871	2008	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	0.9880		Females	$W = 0.0314\ L^{2.7511}$	340	0.9412

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: 2003-2008 (R/*V "Vizconde de Eza"*). Indet. means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008. (M – Males; F-Females; I-Indet.;T-Total).

	2003 (*)				2004				2006				2007				2008			
Lenght (cm.)	M	F	I	T	M	F	I	T	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	0.00	0.01	0.00	0.01	0.01	0.02	0.00	0.04
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	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01
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	0.02	0.00	0.00	0.02	0.08	0.03	0.00	0.11
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	0.04	0.03	0.00	0.07	0.19	0.15	0.00	0.34
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	0.04	0.00	0.00	0.04	0.14	0.13	0.00	0.27
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	0.02	0.01	0.00	0.03	0.12	0.19	0.00	0.31
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	0.01	0.01	0.00	0.02	1.21	1.36	0.00	2.56
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	0.01	0.00	0.00	0.01	5.14	6.23	0.00	11.37
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	0.02	0.04	0.00	0.06	8.51	10.05	0.00	18.56
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	0.05	0.02	0.00	0.07	6.60	7.42	0.00	14.02
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	0.05	0.06	0.00	0.12	2.99	3.61	0.00	6.60
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	0.07	0.06	0.00	0.14	1.94	0.81	0.00	2.74
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	0.07	0.13	0.00	0.21	0.83	0.78	0.00	1.61
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	0.14	0.17	0.00	0.31	0.32	0.35	0.00	0.67
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	0.11	0.14	0.00	0.25	0.14	0.29	0.00	0.43
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	0.10	0.14	0.00	0.24	0.06	0.37	0.00	0.43
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	0.11	0.07	0.00	0.18	0.13	0.05	0.00	0.19
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	0.02	0.13	0.00	0.15	0.09	0.29	0.00	0.37
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	0.07	0.04	0.00	0.12	0.07	0.24	0.00	0.31
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	0.02	0.03	0.00	0.05	0.06	0.09	0.00	0.16
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	0.02	0.05	0.00	0.07	0.22	0.07	0.00	0.29
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	0.05	0.02	0.00	0.07	0.04	0.06	0.00	0.10
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	0.02	0.04	0.00	0.06	0.04	0.02	0.00	0.06
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	0.03	0.03	0.00	0.06	0.19	0.03	0.00	0.22
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	0.01	0.01	0.00	0.02	0.02	0.02	0.00	0.04
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	0.01	0.01	0.00	0.02	0.05	0.03	0.00	0.09
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	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.06
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	0.00	0.00	0.00	0.00	0.04	0.00	0.00	0.04
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	0.00	0.01	0.00	0.01	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	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
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	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	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
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	0.00	0.01	0.00	0.01	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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	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	1.13	1.30	0.00	2.43	29.27	32.78	0.00	62.05
Nº samples:				14				9				22				32				34
Nº Ind.:	-	-	160	160	-	-	55	55	143	167	0	310	107	119	0	226	739	827	0	1566
Sampled catch:				84				34				176				168				1814
Range:				13-81				24-55				13-79				12-76				12-74
Total catch:				84				34				176				168				1814
Total hauls:				40				58				101				99				103

TABLE 7.- Swept area, number of hauls and **roughhead grenadier** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2008, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

	2003 (*)				2004				2006				2007				2008			
Stratum	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
385	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0229	2	0.000	0.000	0.0225	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	0.0225	2	45.990	51.746	0.0435	4	20.320	11.817
388	0.0334	3	0.000	0.000	0.0105	1	43.300		0.0566	5	26.406	7.803	0.0563	5	37.663	22.136	0.0559	5	15.056	11.298
389	0.0454	4	0.000	0.000	0.0225	2	1.875	2.652	0.0795	7	1.426	2.642	0.0900	8	3.075	8.697	0.0780	7	19.007	23.458
390	0.0563	5	0.560	1.252	0.0345	3	0.007	0.012	0.1249	11	0.000	0.000	0.1350	12	0.000	0.000	0.1395	12	0.580	1.338
391	0.0338	3	0.017	0.029	0.0218	2	0.018	0.025	0.0450	4	178.123	304.579	0.0450	4	86.525	171.255	0.0454	4	248.947	142.328
392	0.0116	1	3.900	-	0.0214	2	200.650	255.195	0.0229	2	118.025	159.347	0.0225	2	129.950	138.805	0.0221	2	58.175	54.836
729	0.0210	2	37.750	4.596	0.0221	2	29.475	17.501	0.0338	3	25.164	23.944	0.0338	3	26.490	13.222	0.0338	3	19.943	6.923
730	0.0221	2	101.050	37.972	0.0221	2	33.715	0.544	0.0326	3	53.270	7.021	0.0225	2	81.378	33.061	0.0323	3	35.119	29.483
731	0.0229	2	3.510	1.824	0.0233	2	10.450	5.162	0.0341	3	10.512	3.252	0.0338	3	14.333	7.365	0.0330	3	14.333	10.000
732	0.0113	1	34.400	-	0.0210	2	39.490	7.594	0.0334	3	22.164	9.200	0.0338	3	11.151	3.253	0.0446	4	21.545	3.045
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	15.553	5.137	0.0454	4	23.450	16.806	0.0338	3	19.104	14.162	0.0431	4	23.939	36.979
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	65.850	106.305	0.0225	2	39.315	9.638	0.0225	2	23.400	8.202	0.0221	2	30.580	20.182
741	0.0113	1	8.7	-	0.0323	3	1.055	1.342	0.0218	2	17.557	23.112	0.0225	2	4.650	6.166	0.0210	2	10.359	10.390
742	0.0116	1	24.4	-	0.0120	1	4.700	-	0.0229	2	20.933	7.015	0.0225	2	14.493	2.011	0.0210	2	16.861	11.943
743	n.s.	n.s.	n.s.	n.s.	0.0188	2	26.245	6.017	0.0225	2	10.574	6.353	0.0225	2	29.666	25.928	0.0203	2	25.509	13.847
744	n.s.	n.s.	n.s.	n.s.	0.0101	1	2.550	-	0.0229	2	15.365	15.111	0.0218	2	33.965	0.375	0.0221	2	58.670	15.570
745	0.0341	3	17.546	10.764	0.0319	3	5.800	2.722	0.0686	6	8.238	5.438	0.0675	6	3.624	1.509	0.0555	5	14.284	7.402
746	0.0446	4	63.8	71.784	0.0338	3	26.205	21.151	0.0675	6	41.767	29.972	0.0664	6	34.607	22.333	0.0638	6	30.720	16.486
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	43.627	13.999	0.1230	11	42.307	40.112	0.1238	11	62.510	26.732	0.1069	10	28.717	25.198
748	0.0109	1	55.98	-	0.0199	2	22.515	18.547	0.0326	3	67.920	73.796	0.0338	3	33.533	16.455	0.0218	2	217.340	286.322
749	0.0221	2	145.2	23.193	0.0221	2	45.900	51.336	0.0229	2	25.930	31.919	0.0113	1	28.700	-	0.0214	2	47.452	11.670
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	56.750	36.416	0.1005	9	16.866	18.117	0.0679	6	19.516	24.114	0.0844	8	11.937	6.673
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0454	4	4.253	3.543	0.0225	2	24.445	7.983	0.0413		49.038	8.141

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

TABLE 8.- Stratified mean catches (Kg) and SD of **roughhead grenadier** by stratum and year (2003-2008). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

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

TABLE 9.- Survey estimates (by the swept area method) of **roughhead grenadier** biomass (t.) and SD by stratum and year in 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 2006-2008.

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

TABLE 10.- Roughhead grenadier length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2008 (R/*V "Vizconde de Eza"*). Indet. means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008. (M – Males; F-Females; I-Indet.;T-Total).

	2003 (*)				2004				2006				2007				2008			
Lenght (cm.)	M	F	I	T	M	F	I	T	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	0.00	0.02	0.01	0.03	0.00	0.00	0.02	0.02
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	0.00	0.04	0.15	0.19	0.00	0.03	0.09	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	0.40	0.17	0.70	1.26	0.28	0.08	1.42	1.78
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	0.08	0.06	0.02	0.16	0.11	0.01	0.03	0.15
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	0.34	0.21	0.02	0.57	0.10	0.13	0.01	0.24
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	0.94	0.75	0.00	1.69	0.69	0.64	0.03	1.36
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	0.28	0.33	0.00	0.61	0.24	0.38	0.00	0.62
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	0.54	0.68	0.01	1.23	0.39	0.46	0.00	0.85
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	0.60	0.81	0.00	1.42	0.74	0.58	0.00	1.31
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	0.84	0.55	0.00	1.39	0.87	0.77	0.00	1.63
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	1.21	1.12	0.00	2.32	1.19	1.32	0.00	2.51
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	1.13	1.22	0.00	2.35	1.07	1.20	0.00	2.26
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	1.46	1.45	0.00	2.91	1.58	1.36	0.00	2.93
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	1.89	1.71	0.00	3.60	2.16	1.77	0.00	3.94
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	1.54	1.47	0.00	3.01	2.61	2.21	0.00	4.82
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	1.74	1.56	0.00	3.29	2.60	2.67	0.00	5.26
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	1.97	1.45	0.00	3.41	1.92	1.97	0.00	3.89
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	1.85	1.38	0.00	3.23	1.60	1.74	0.00	3.34
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	1.57	1.57	0.00	3.14	1.36	1.77	0.00	3.13
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	0.98	1.70	0.00	2.67	0.82	1.89	0.00	2.71
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	0.40	2.38	0.00	2.78	0.37	1.71	0.00	2.09
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	0.15	2.18	0.00	2.32	0.10	1.82	0.00	1.91
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	0.05	1.90	0.00	1.95	0.03	1.83	0.00	1.86
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	0.00	1.49	0.00	1.49	0.00	2.28	0.00	2.29
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	0.01	1.18	0.00	1.20	0.00	1.87	0.00	1.87
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	0.00	1.05	0.00	1.05	0.00	1.53	0.00	1.53
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	0.00	0.69	0.00	0.69	0.00	0.88	0.00	0.88
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	0.01	0.37	0.00	0.38	0.00	0.62	0.00	0.62
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	0.01	0.35	0.00	0.37	0.00	0.58	0.00	0.58
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	0.00	0.28	0.00	0.28	0.00	0.15	0.00	0.15
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	0.00	0.21	0.00	0.21	0.00	0.11	0.00	0.11
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	0.00	0.07	0.00	0.07	0.00	0.07	0.00	0.07
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	0.00	0.03	0.00	0.03	0.00	0.03	0.00	0.03
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	0.00	0.08	0.00	0.08	0.00	0.00	0.00	0.00
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	0.00	0.05	0.00	0.05	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	0.00	0.04	0.00	0.04	0.00	0.02	0.00	0.02
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	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00
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	0.00	0.01	0.00	0.01	0.00	0.02	0.00	0.02
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	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	0.00	0.02	0.00	0.02	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	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
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**	**19.99**	**30.65**	**0.90**	**51.54**	**20.84**	**34.48**	**1.59**	**56.91**
Nº samples:				22				43				83				71				87
Nº Ind.:	943	1268	37	2248	1188	1359	17	2564	2107	2423	25	4555	1589	2246	69	3904	2022	3019	176	5217
Sampled catch:				1013				1579				2985				2712				3286.9
Range:				2-38				2-37.5				1.5-39				2-41				1.5-42.5
Total catch:				1013				1579				2985				2712				3286.9
Total hauls:				40				58				101				99				103

TABLE 11.- Swept area, number of hauls and **redfish** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2008, on board R/V "*Vizconde de Eza"*. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

Stratum	2003 (*)				2004				2006				2007				2008			
	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
385	0.0225	2	0.001	0.001	0.0229	2	0.005	0.007	0.0229	2	0.000	0.000	0.0225	2	0.041	0.027	0.0229	2	0.495	0.644
387	0.0229	2	1.715	1.110	0.0214	2	56.000	51.619	0.0225	2	113.685	116.171	0.0225	2	80.400	34.083	0.0435	4	185.125	58.384
388	0.0334	3	6.453	6.142	0.0105	1	11.800	-	0.0566	5	66.040	32.355	0.0563	5	162.078	100.787	0.0559	5	212.750	142.882
389	0.0454	4	0.801	0.912	0.0225	2	33.050	44.901	0.0795	7	46.008	84.876	0.0900	8	10.723	18.542	0.0780	7	385.331	509.833
390	0.0563	5	0.580	1.242	0.0345	3	0.000	0.000	0.1249	11	0.188	0.318	0.1350	12	0.173	0.473	0.1395	12	0.922	2.280
391	0.0338	3	0.087	0.085	0.0218	2	1.435	1.718	0.0450	4	7.135	5.793	0.0450	4	6.013	6.351	0.0454	4	1093.130	1444.102
392	0.0116	1	46.300	-	0.0214	2	1222.320	1712.075	0.0229	2	4367.190	5741.976	0.0225	2	959.650	350.230	0.0221	2	209.150	15.203
729	0.0210	2	88.800	73.963	0.0221	2	310.250	239.780	0.0338	3	202.167	262.943	0.0338	3	128.889	184.792	0.0338	3	618.467	508.067
730	0.0221	2	231.080	64.389	0.0221	2	55.550	72.761	0.0326	3	145.923	148.390	0.0225	2	367.737	518.964	0.0323	3	29.790	42.861
731	0.0229	2	39.365	8.252	0.0233	2	79.550	68.236	0.0341	3	19.053	7.921	0.0338	3	37.100	28.646	0.0330	3	132.967	154.885
732	0.0113	1	72.200	-	0.0210	2	42.025	55.119	0.0334	3	5.638	7.067	0.0338	3	12.115	13.539	0.0446	4	11.975	11.596
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	111.667	109.389	0.0454	4	72.600	47.167	0.0338	3	115.667	70.383	0.0431	4	132.600	203.165
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	5.383	7.029	0.0225	2	12.328	3.921	0.0225	2	24.728	28.585	0.0221	2	22.485	27.457
741	0.0113	1	2240	-	0.0323	3	0.255	0.255	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.555	0.049
742	0.0116	1	0	-	0.0120	1	0.331	-	0.0229	2	0.000	0.000	0.0225	2	0.300	0.424	0.0210	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	0.0225	2	0.000	0.000	0.0203	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	0.0218	2	0.479	0.677	0.0221	2	0.000	0.000
745	0.0341	3	1753.1	3028.407	0.0319	3	0.000	0.000	0.0686	6	0.119	0.221	0.0675	6	0.380	0.450	0.0555	5	0.364	0.664
746	0.0446	4	0	0	0.0338	3	0.000	0.000	0.0675	6	0.118	0.185	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	0.200	0.346	0.1230	11	0.000	0.000	0.1238	11	0.000	0.000	0.1069	10	0.012	0.039
748	0.0109	1	2.7	-	0.0199	2	0.440	0.622	0.0326	3	0.130	0.225	0.0338	3	0.830	1.050	0.0218	2	4.290	6.067
749	0.0221	2	0	0	0.0221	2	0.000	0.000	0.0229	2	0.000	0.000	0.0113	1	0.000	-	0.0214	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	0.0679	6	0.000	0.000	0.0844	8	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	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000

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

TABLE 12.- Stratified mean catches (Kg) and SD of **redfish** by stratum and year (2003-2008). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

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

TABLE 13.- Survey estimates (by the swept area method) of **redfish** biomass (t.) and SD by stratum and year in 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 2006-2008.

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

TABLE 14.- Redfish length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2008 (R/*V "Vizconde de Eza"*). Indet. means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008. (M – Males; F-Females; I-Indet.;T-Total).

	2003 (*)				2004				2006				2007				2008			
Lenght (cm.)	M	F	I	T	M	F	I	T	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	0.00	0.00	0.04	0.04	0.00	0.00	0.16	0.16
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	0.00	0.00	17.45	17.45	0.00	0.00	8.19	8.19
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	0.01	0.19	26.86	27.06	0.00	0.00	17.35	17.35
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	1.45	2.17	1.64	5.26	0.81	0.21	57.74	58.76
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	4.45	3.71	0.53	8.69	3.70	2.13	17.78	23.62
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	3.44	1.80	0.01	5.25	8.31	3.62	0.11	12.04
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	5.97	3.81	0.00	9.77	19.39	18.88	0.00	38.27
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	11.85	13.08	0.00	24.92	66.37	46.99	0.05	113.41
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	25.50	15.85	0.00	41.35	96.85	63.72	0.00	160.57
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	36.00	30.40	0.00	66.41	81.51	63.44	0.00	144.94
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	19.89	32.60	0.00	52.48	49.16	50.05	0.00	99.21
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	7.34	11.29	0.00	18.63	25.59	33.03	0.00	58.62
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	4.69	6.69	0.00	11.39	22.11	21.05	0.00	43.16
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	4.33	5.57	0.00	9.90	10.25	9.73	0.00	19.99
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	5.48	7.42	0.00	12.90	3.50	4.98	0.00	8.48
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	2.66	2.82	0.00	5.48	1.11	2.86	0.00	3.96
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	0.20	0.96	0.00	1.16	0.49	0.68	0.00	1.18
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	0.05	0.13	0.00	0.18	0.06	0.29	0.00	0.35
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	0.02	0.03	0.00	0.06	0.01	0.12	0.00	0.13
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	0.01	0.03	0.00	0.04	0.01	0.11	0.00	0.12
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	0.01	0.00	0.00	0.01	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	0.00	0.00	0.00	0.00	0.00	0.13	0.00	0.13
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	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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	0.01	0.00	0.00	0.01	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	0.00	0.01	0.00	0.01	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	133.36	138.57	46.53	318.46	389.23	322.03	101.39	812.65
Nº samples:				22				28				48				51				52
Nº Ind.:	965	799	304	2068	1903	1662	409	3974	3205	3089	1205	7499	2669	2360	2016	7045	3957	3147	1372	8476
Sampled catch:				8366				3970				11080				4675				12283
Range:				5-40				5-39				5-48				5-53				5-47
Total catch:				8368				3970				11080				4675				12283
Total hauls:				40				58				101				99				103

TABLE 15.- Swept area, number of hauls and **thorny skate** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2008, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

	2003 (*)				2004				2006				2007				2008			
Stratum	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
385	0.0225	2	0.000	0.000	0.0229	2	7.050	9.970	0.0229	2	6.044	4.588	0.0225	2	30.260	11.653	0.0229	2	37.608	26.315
387	0.0229	2	5.295	4.957	0.0214	2	10.700	2.263	0.0225	2	16.438	16.599	0.0225	2	32.485	2.143	0.0435	4	26.276	17.380
388	0.0334	3	13.273	13.347	0.0105	1	16.700		0.0566	5	44.186	24.414	0.0563	5	31.096	13.246	0.0559	5	37.148	12.932
389	0.0454	4	5.984	5.117	0.0225	2	10.900	13.294	0.0795	7	32.979	14.712	0.0900	8	25.861	11.704	0.0780	7	33.065	8.029
390	0.0563	5	0.190	0.425	0.0345	3	1.997	1.730	0.1249	11	5.529	7.479	0.1350	12	7.366	7.441	0.1395	12	5.044	7.191
391	0.0338	3	1.723	1.509	0.0218	2	64.250	65.125	0.0450	4	151.088	51.460	0.0450	4	100.658	56.818	0.0454	4	190.795	35.749
392	0.0116	1	10.050	-	0.0214	2	62.300	0.141	0.0229	2	149.500	165.604	0.0225	2	330.100	170.554	0.0221	2	159.247	95.534
729	0.0210	2	54.955	31.176	0.0221	2	140.375	186.712	0.0338	3	49.261	27.663	0.0338	3	164.760	243.624	0.0338	3	34.265	25.540
730	0.0221	2	71.400	60.670	0.0221	2	0.000	0.000	0.0326	3	4.348	7.532	0.0225	2	0.000	0.000	0.0323	3	0.000	0.000
731	0.0229	2	38.705	25.873	0.0233	2	18.510	22.330	0.0341	3	46.757	62.791	0.0338	3	57.448	64.552	0.0330	3	9.140	13.870
732	0.0113	1	76.200		0.0210	2	0.000	0.000	0.0334	3	2.015	1.851	0.0338	3	0.000	0.000	0.0446	4	0.727	1.454
733	n.s.	n.s.	n.s.	n.s.	0.0330	3	9.363	5.299	0.0454	4	14.573	8.911	0.0338	3	6.427	8.497	0.0431	4	14.693	15.502
734	n.s.	n.s.	n.s.	n.s.	0.0304	3	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000
741	0.0113	1	0	-	0.0323	3	0.000	0.000	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000
742	0.0116	1	0	-	0.0120	1	0.000		0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	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	0.0225	2	0.000	0.000	0.0203	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	0.0218	2	0.000	0.000	0.0221	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	0.0675	6	0.000	0.000	0.0555	5	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	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000
747	n.s.	n.s.			0.0308	3	0.000	0.000	0.1230	11	0.000	0.000	0.1238	11	0.000	0.000	0.1069	10	0.000	0.000
748	0.0109	1	65.220	-	0.0199	2	0.000	0.000	0.0326	3	0.837	1.449	0.0338	3	0.000	0.000	0.0218	2	0.000	0.000
749	0.0221	2	8.060	6.067	0.0221	2	0.000	0.000	0.0229	2	0.000	0.000	0.0113	1	0.000	-	0.0214	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	0.0679	6	0.000	0.000	0.0844	8	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	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000

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

Table 16.- Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2003-2008 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
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

TABLE 17.- Stratified mean catches (Kg) and SD of **thorny skate** by stratum and year (2003-2008). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

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

TABLE 18.- Survey estimates (by the swept area method) of **thorny skate** biomass (t.) and SD by stratum and year in 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 2006-2008.

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

TABLE 19.- Thorny skate length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2008 (R/*V "Vizconde de Eza"*). Indet. means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008. (M – Males; F-Females; I-Indet.;T-Total).

	2003 (*)				2004				2006				2007				2008			
Lenght (cm.)	M	F	I	T	M	F	I	T	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	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	0.16	0.08	0.00	0.24	0.09	0.11	0.00	0.20
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	0.08	0.12	0.00	0.21	0.12	0.09	0.00	0.20
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	0.05	0.10	0.00	0.15	0.03	0.03	0.00	0.06
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	0.13	0.12	0.00	0.25	0.04	0.01	0.00	0.05
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	0.18	0.10	0.00	0.28	0.09	0.01	0.00	0.10
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	0.15	0.19	0.00	0.34	0.02	0.01	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	0.13	0.14	0.00	0.27	0.02	0.02	0.00	0.04
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	0.13	0.16	0.00	0.30	0.08	0.07	0.00	0.14
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	0.10	0.06	0.00	0.16	0.02	0.05	0.00	0.08
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	0.08	0.05	0.00	0.12	0.04	0.05	0.00	0.10
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	0.08	0.06	0.00	0.13	0.07	0.05	0.00	0.12
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	0.09	0.03	0.00	0.12	0.05	0.04	0.00	0.10
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	0.06	0.05	0.00	0.11	0.03	0.05	0.00	0.08
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	0.05	0.06	0.00	0.11	0.01	0.03	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	0.02	0.01	0.00	0.03	0.05	0.01	0.00	0.06
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	0.03	0.06	0.00	0.09	0.02	0.05	0.00	0.07
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	0.04	0.04	0.00	0.08	0.01	0.02	0.00	0.03
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	0.05	0.09	0.00	0.14	0.03	0.06	0.00	0.09
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	0.05	0.09	0.00	0.14	0.02	0.01	0.00	0.03
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	0.12	0.13	0.00	0.25	0.06	0.03	0.00	0.09
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	0.09	0.15	0.00	0.24	0.07	0.08	0.00	0.15
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	0.21	0.24	0.00	0.44	0.08	0.09	0.00	0.17
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	0.19	0.34	0.00	0.53	0.03	0.13	0.00	0.16
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	0.30	0.27	0.00	0.57	0.12	0.22	0.00	0.34
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	0.27	0.59	0.00	0.86	0.22	0.28	0.00	0.50
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	0.46	0.76	0.00	1.22	0.29	0.35	0.00	0.65
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	0.42	0.62	0.00	1.04	0.35	0.45	0.00	0.81
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	0.34	0.54	0.00	0.88	0.39	0.45	0.00	0.84
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	0.37	0.64	0.00	1.02	0.32	0.44	0.00	0.76
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	0.25	0.38	0.00	0.62	0.25	0.37	0.00	0.62
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	0.18	0.24	0.00	0.43	0.19	0.15	0.00	0.34
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	0.12	0.13	0.00	0.25	0.26	0.16	0.00	0.42
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	0.04	0.05	0.00	0.10	0.10	0.13	0.00	0.23
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	0.03	0.03	0.00	0.06	0.09	0.03	0.00	0.12
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	0.01	0.00	0.00	0.01	0.07	0.00	0.00	0.07
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	0.01	0.00	0.00	0.01	0.05	0.02	0.00	0.07
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	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.03
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	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02
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	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01
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	5.10	6.71	0.00	11.81	3.85	4.18	0.00	8.03
Nº samples:				26				18				42				43				39
Nº Ind.:	197	226	0	423	170	135	0	305	312	420	0	732	457	621	0	1078	344	378	0	722
Sampled catch:				648				617				1832				2325				1931.6
Range:				11-89				14-83				13-81				12-82				12-89
Total catch:				654				682				1832				2325				1931.6
Total hauls:				40				58				101				99				103

TABLE 20.- Swept area, number of hauls and **black dogfish** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2003-2008, on board R/V "*Vizconde de Eza*". (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

Stratum	2003 (*)				2004				2006				2007				2008			
	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD	Swept area	Tow number	Mean catch	SD
385	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0229	2	0.000	0.000	0.0225	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	0.0225	2	0.000	0.000	0.0435	4	0.000	0.000
388	0.0334	3	0.000	0.000	0.0105	1	0.000	-	0.0566	5	0.000	0.000	0.0563	5	0.000	0.000	0.0559	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	0.0900	8	0.000	0.000	0.0780	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	0.1350	12	0.000	0.000	0.1395	12	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	0.0450	4	0.000	0.000	0.0454	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	0.0225	2	0.000	0.000	0.0221	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	0.0338	3	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	0.0225	2	19.488	26.067	0.0323	3	27.367	47.400
731	0.0229	2	0.000	0.000	0.0233	2	0.000	0.000	0.0341	3	0.000	0.000	0.0338	3	0.000	0.000	0.0330	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	0.0338	3	0.000	0.000	0.0446	4	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	0.0338	3	0.000	0.000	0.0431	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	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000
741	0.0113	1	0	-	0.0323	3	0.000	0.000	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000
742	0.0116	1	0	-	0.0120	1	0.000	-	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	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	0.0225	2	0.000	0.000	0.0203	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	0.0218	2	1.663	0.541	0.0221	2	0.880	0.198
745	0.0341	3	0.007	0.012	0.0319	3	0.000	0.000	0.0686	6	0.000	0.000	0.0675	6	0.000	0.000	0.0555	5	0.000	0.000
746	0.0446	4	0	0	0.0338	3	0.000	0.000	0.0675	6	9.033	10.572	0.0664	6	9.171	6.742	0.0638	6	6.142	1.917
747	n.s.	n.s.	n.s.	n.s.	0.0308	3	4.067	3.591	0.1230	11	3.656	2.707	0.1238	11	6.015	5.815	0.1069	10	5.894	5.184
748	0.0109	1	0	-	0.0199	2	36.980	52.298	0.0326	3	15.713	18.383	0.0338	3	35.817	40.266	0.0218	2	80.800	114.268
749	0.0221	2	219.750	310.773	0.0221	2	17.300	5.515	0.0229	2	91.125	124.599	0.0113	1	229.700	-	0.0214	2	35.410	19.827
750	n.s.	n.s.	n.s.	n.s.	0.0180	2	2.800	3.960	0.1005	9	6.213	9.605	0.0679	6	13.979	28.671	0.0844	8	12.366	21.347
751	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	n.s.	0.0454	4	1.103	1.497	0.0225	2	4.405	0.191	0.0413	4	3.780	2.765

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

TABLE 21.- Stratified mean catches (Kg) and SD of **black dogfish** by stratum and year (2003-2008). n.s. means stratum not surveyed. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

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

TABLE 22.- Survey estimates (by the swept area method) of **black dogfish** biomass (t.) and SD by stratum and year in 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 2006-2008.

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

TABLE 23.- Black dogfish length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2008 (R/*V "Vizconde de Eza"*). Indet. means indeterminate. (*) In 2003, the data correspond to 69% of the total area prospected in 2006-2008. (M – Males; F-Females; I-Indet.;T-Total).

	2003 (*)				2004				2006				2007				2008			
Lenght (cm.)	M	F	I	T	M	F	I	T	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	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	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	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	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	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	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	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	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	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	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	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	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	0.01	0.00	0.00	0.01	0.01	0.00	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	0.00	0.03	0.00	0.03	0.02	0.00	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	0.02	0.00	0.00	0.02	0.01	0.04	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	0.01	0.04	0.00	0.04	0.04	0.06	0.00	0.09
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	0.01	0.02	0.00	0.03	0.03	0.01	0.00	0.04
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	0.03	0.09	0.00	0.12	0.07	0.03	0.00	0.10
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	0.05	0.06	0.00	0.11	0.09	0.08	0.00	0.17
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	0.11	0.18	0.00	0.28	0.18	0.10	0.00	0.28
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	0.11	0.14	0.00	0.25	0.19	0.12	0.00	0.30
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	0.28	0.36	0.00	0.64	0.28	0.15	0.00	0.43
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	0.45	0.22	0.00	0.68	0.55	0.16	0.00	0.71
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	0.65	0.45	0.00	1.10	0.63	0.12	0.00	0.75
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	0.38	0.39	0.00	0.77	0.58	0.13	0.00	0.72
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	0.23	0.29	0.00	0.51	0.17	0.17	0.00	0.34
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	0.13	0.25	0.00	0.38	0.08	0.10	0.00	0.18
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	0.05	0.24	0.00	0.29	0.01	0.12	0.00	0.13
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	0.00	0.24	0.00	0.24	0.02	0.02	0.00	0.04
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	0.00	0.21	0.00	0.21	0.00	0.08	0.00	0.08
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	0.00	0.10	0.00	0.10	0.00	0.07	0.00	0.07
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	0.00	0.06	0.00	0.06	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	0.02	0.00	0.02	0.00	0.04	0.00	0.04	0.00	0.00	0.00	0.00
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	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
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	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
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	2.51	3.41	0.00	5.92	2.95	1.59	0.00	4.53
Nº samples:				1				8				28				28				30
Nº Ind.:	81	118	0	199	58	55	0	113	99	184	0	283	179	245	0	424	269	152	0	421
Sampled catch:				440				127				397				593				526
Range:				44-79				17-75				41-84				41-81				41-85
Total catch:				440				132				397				593				526
Total hauls:				40				58				101				99				103

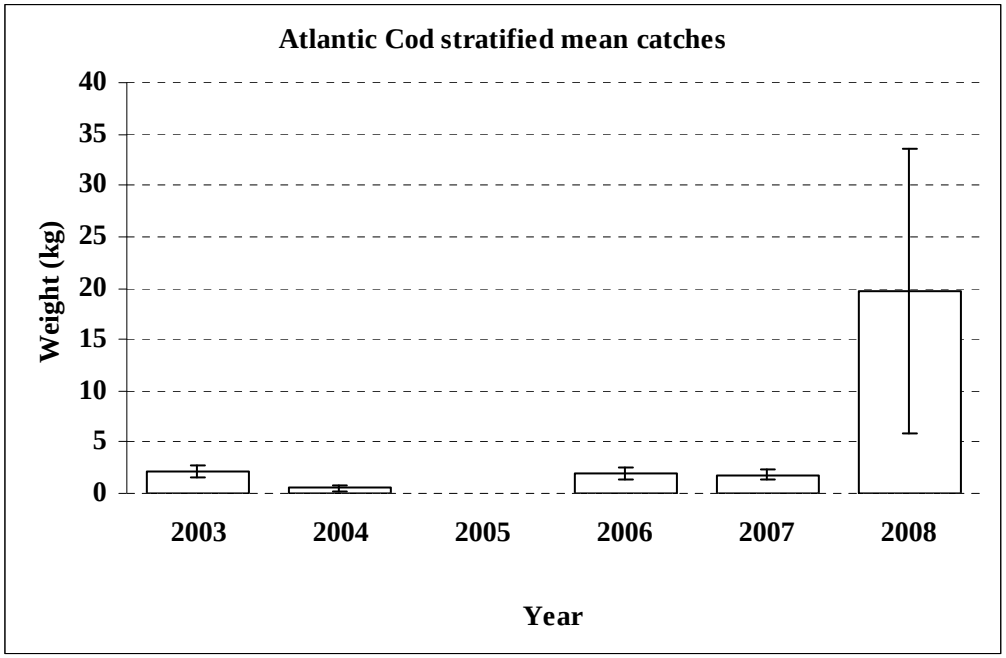


FIGURE 1.- Atlantic cod stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

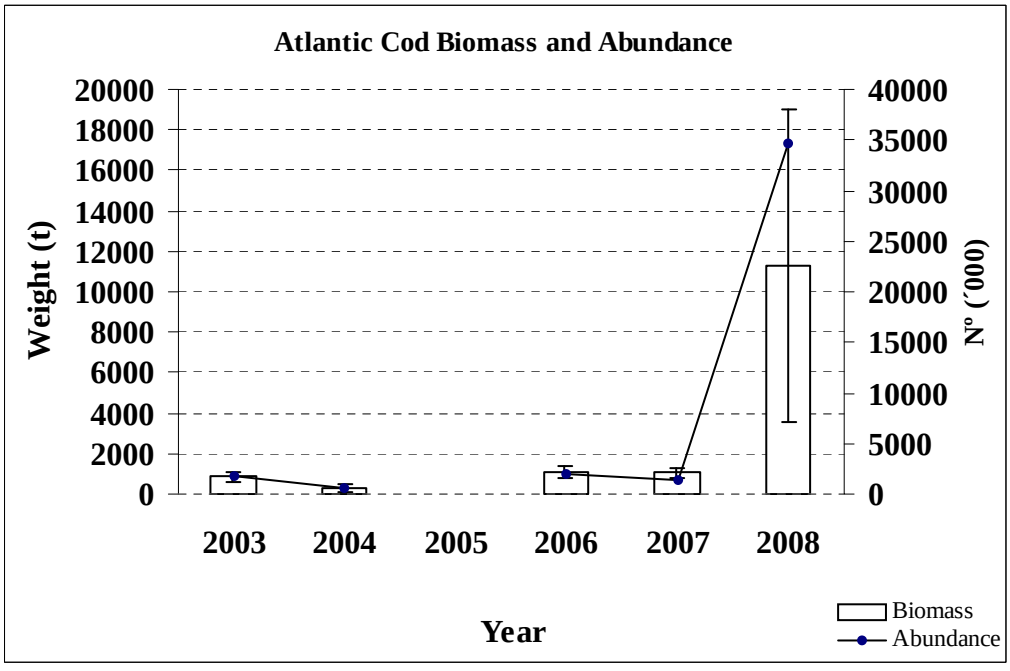


FIGURE 2.- Atlantic cod abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

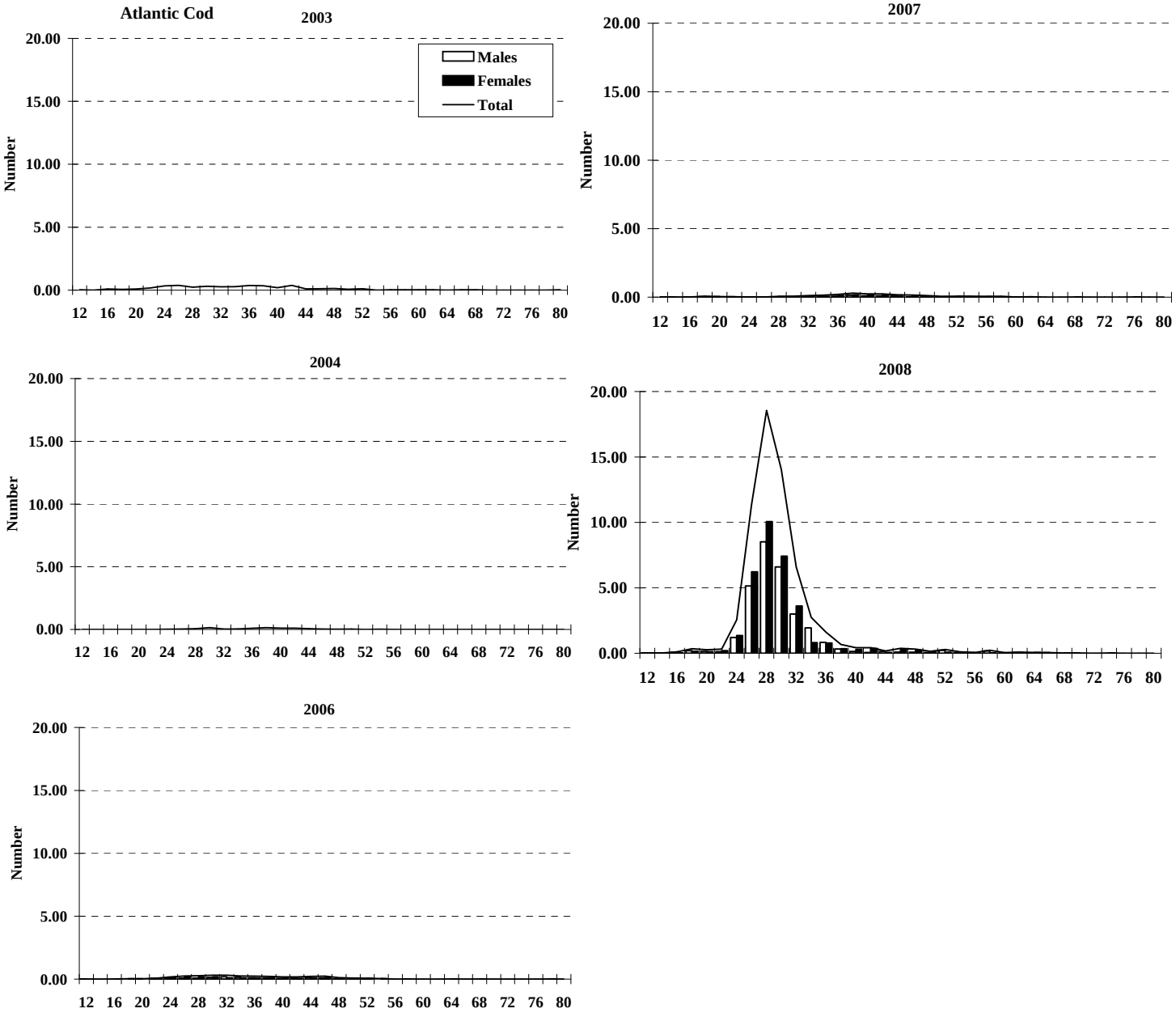
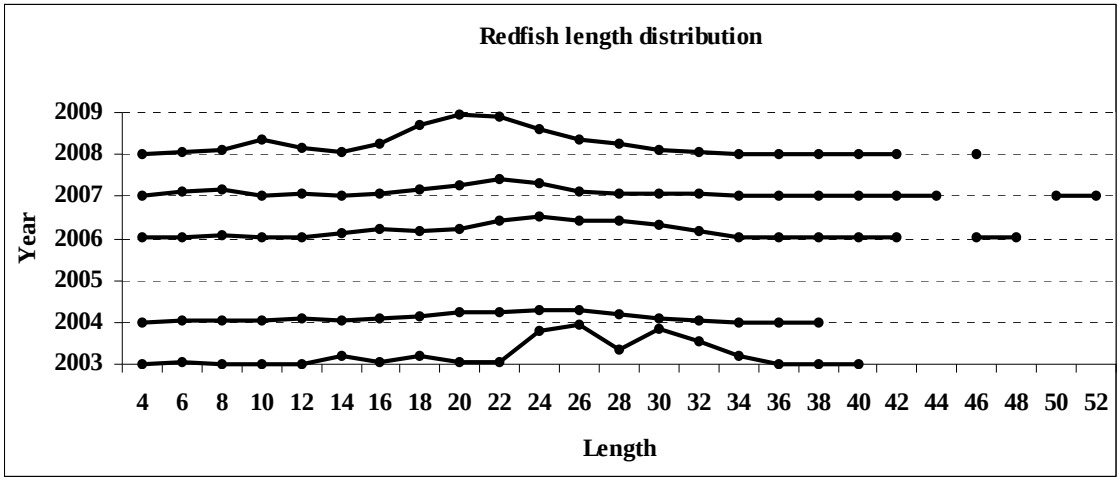
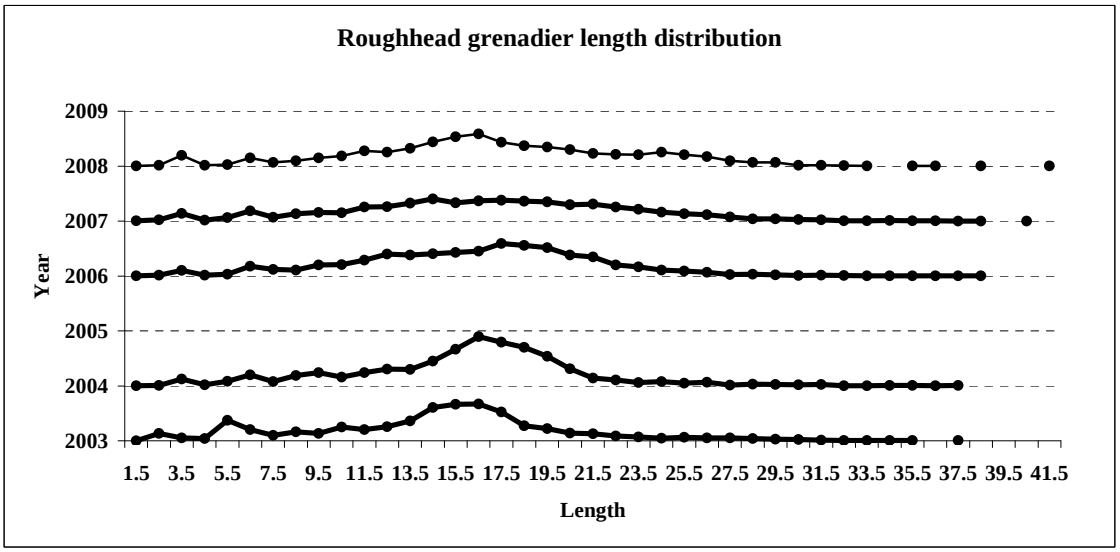


FIGURE 3.- Atlantic cod length distribution (cm) in NAFO 3L: 2003-2008. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.





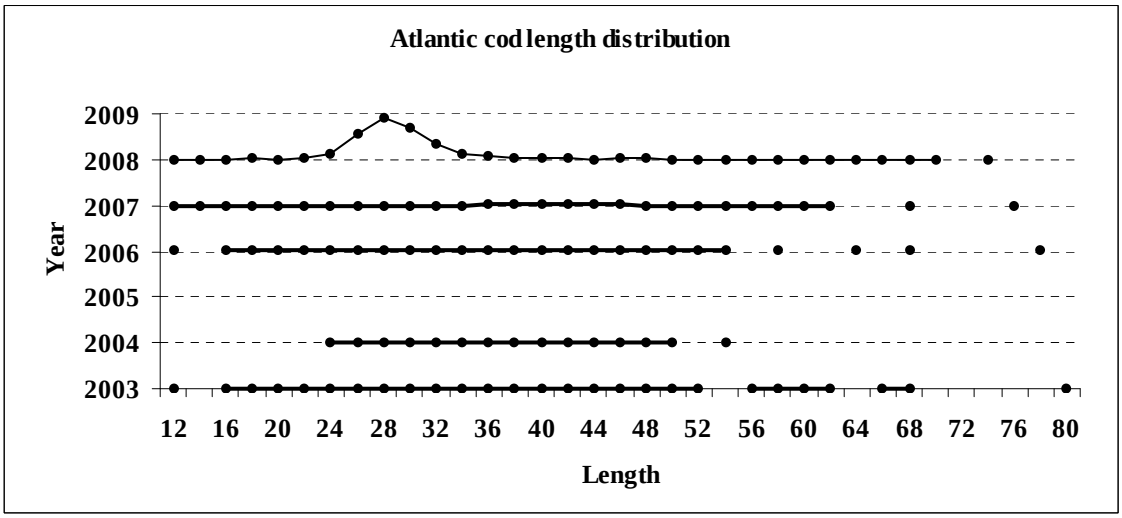


FIGURE 4.- Atlantic cod, **Roughhead grenadier** and **redfish** length distribution (cm) in NAFO 3L: 2003-2008.

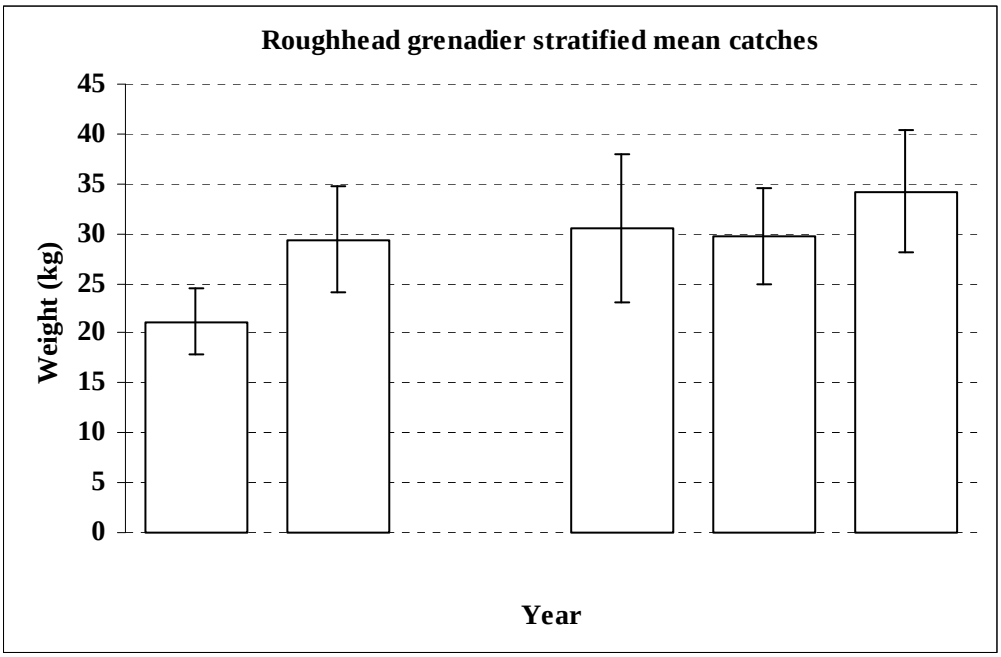


FIGURE 5.- Roughhead grenadier stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

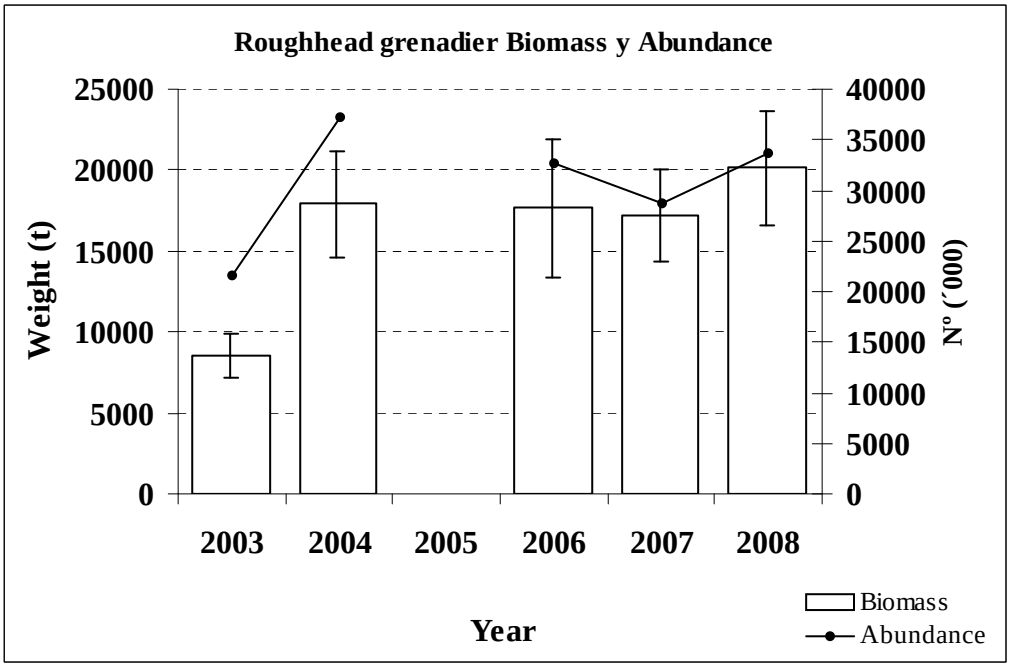


FIGURE 6.- Roughhead grenadier abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

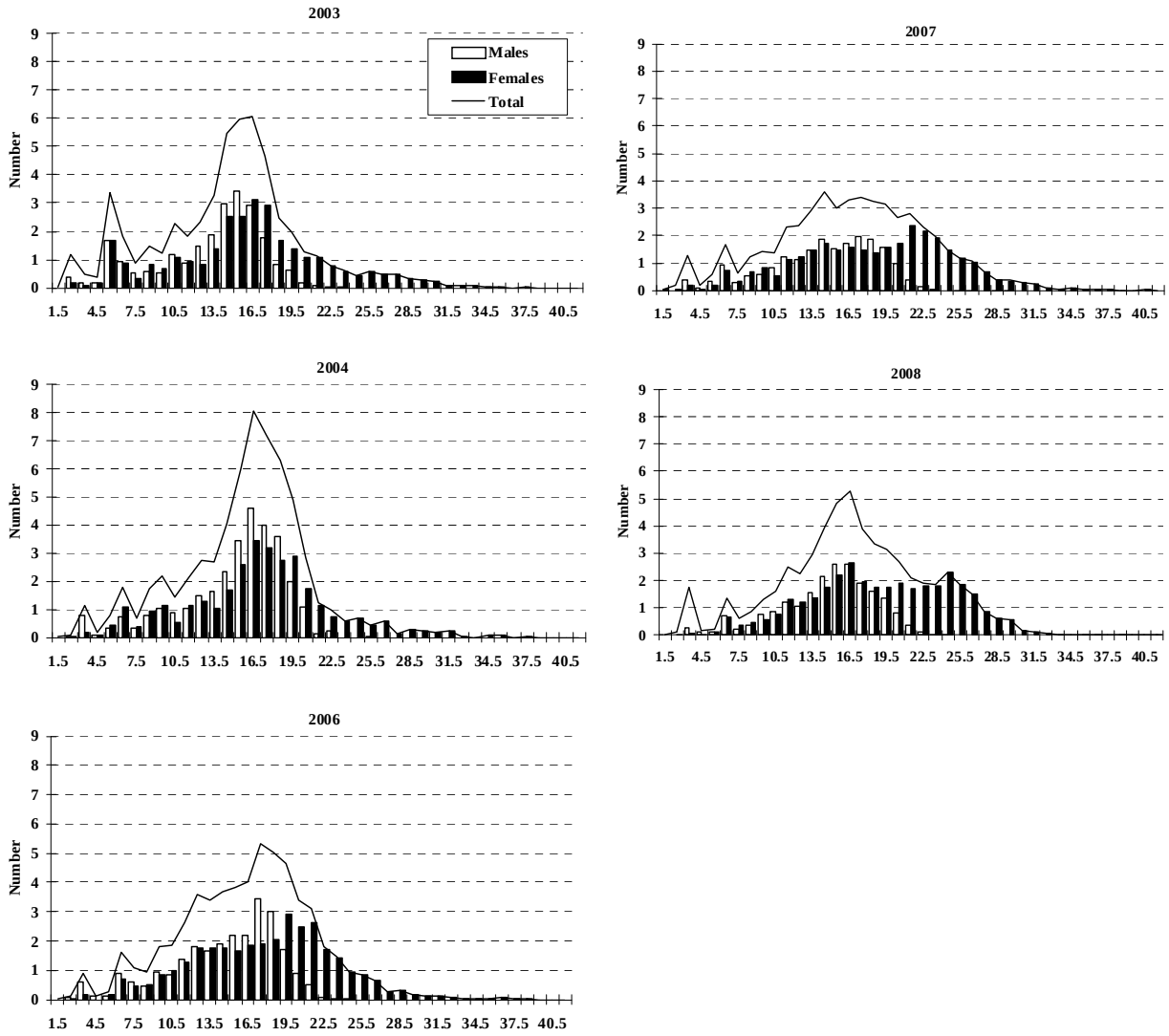


FIGURE 7.- Roughhead grenadier length distribution (cm) in NAFO 3L: 2003-2008. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

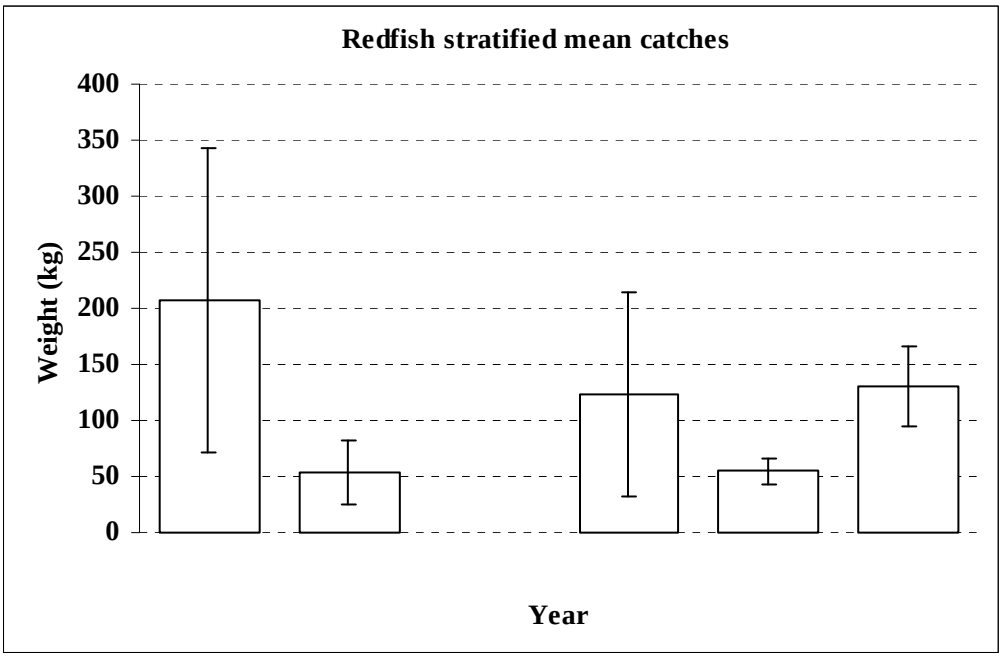


FIGURE 8.- Redfish stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

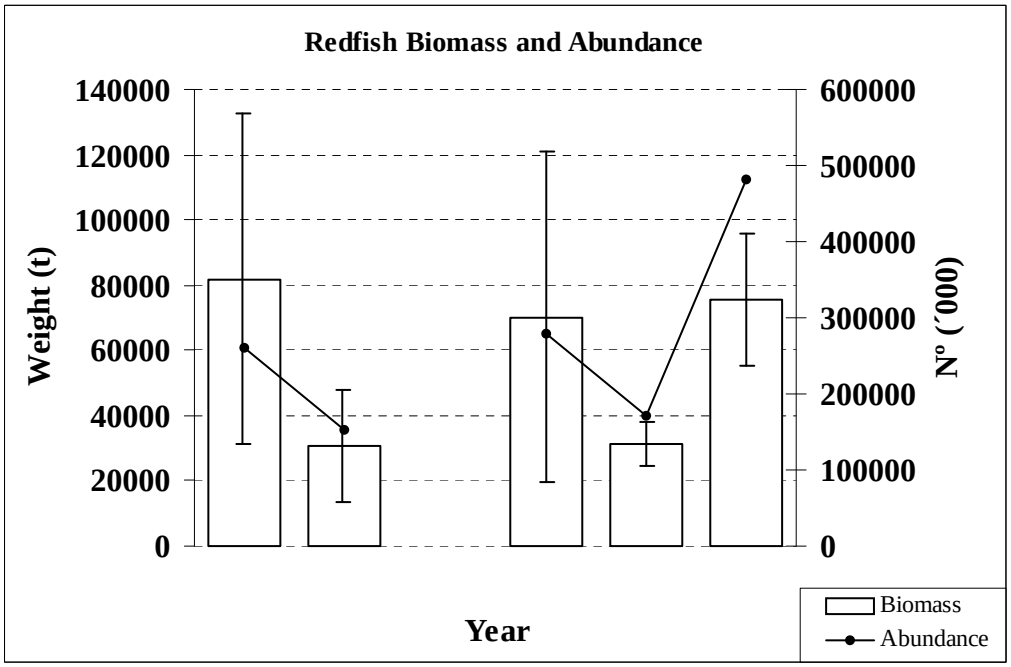


FIGURE 9.- Redfish abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

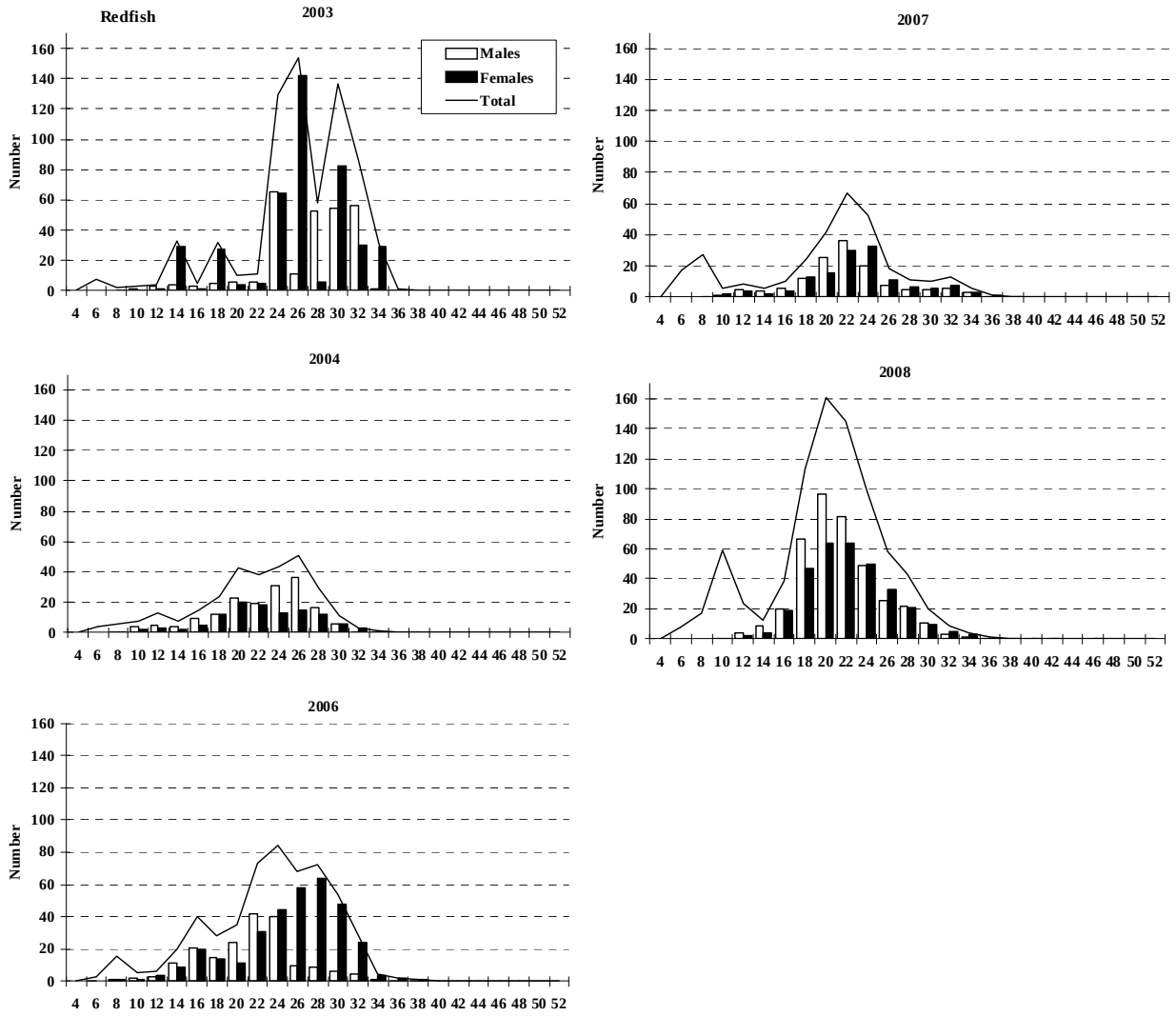


FIGURE 10.- Redfish length distribution (cm) in NAFO 3L: 2003-2008. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

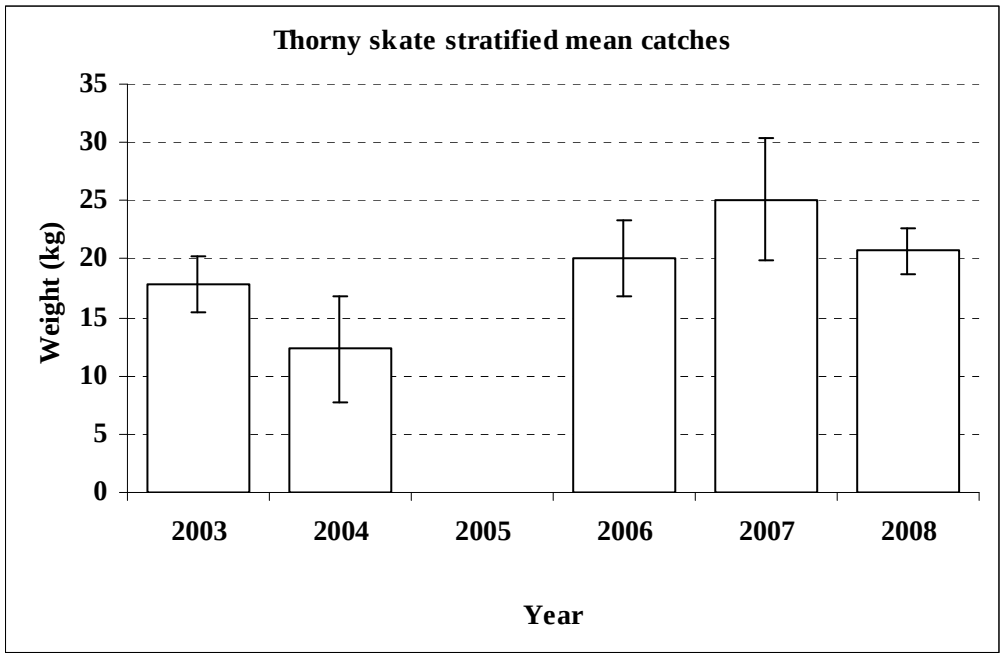


FIGURE 11.- Thorny skate stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

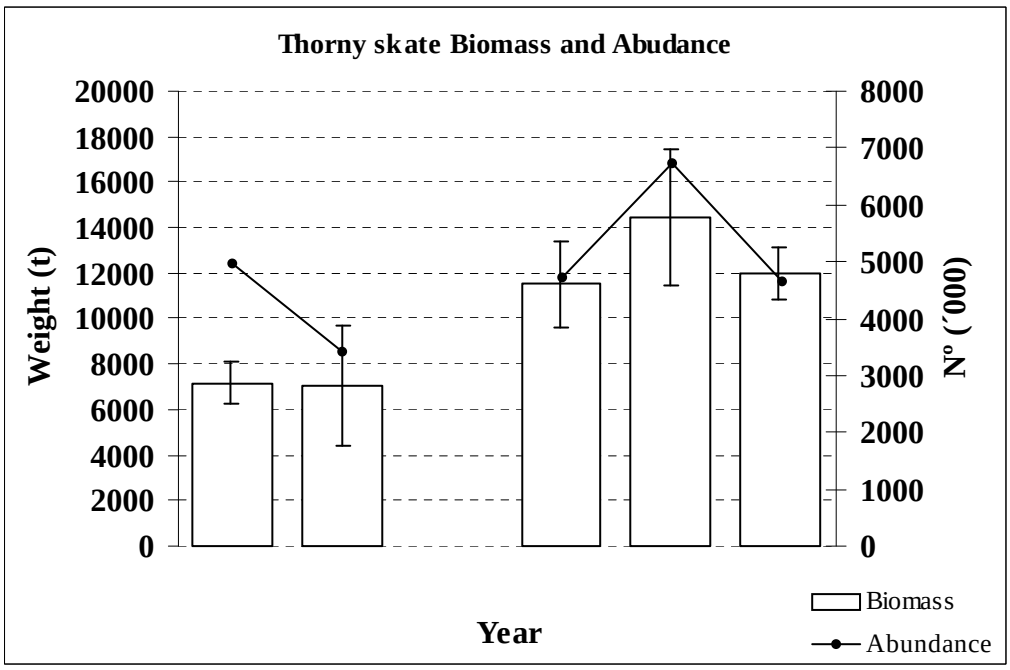


FIGURE 12.- Thorny skate abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

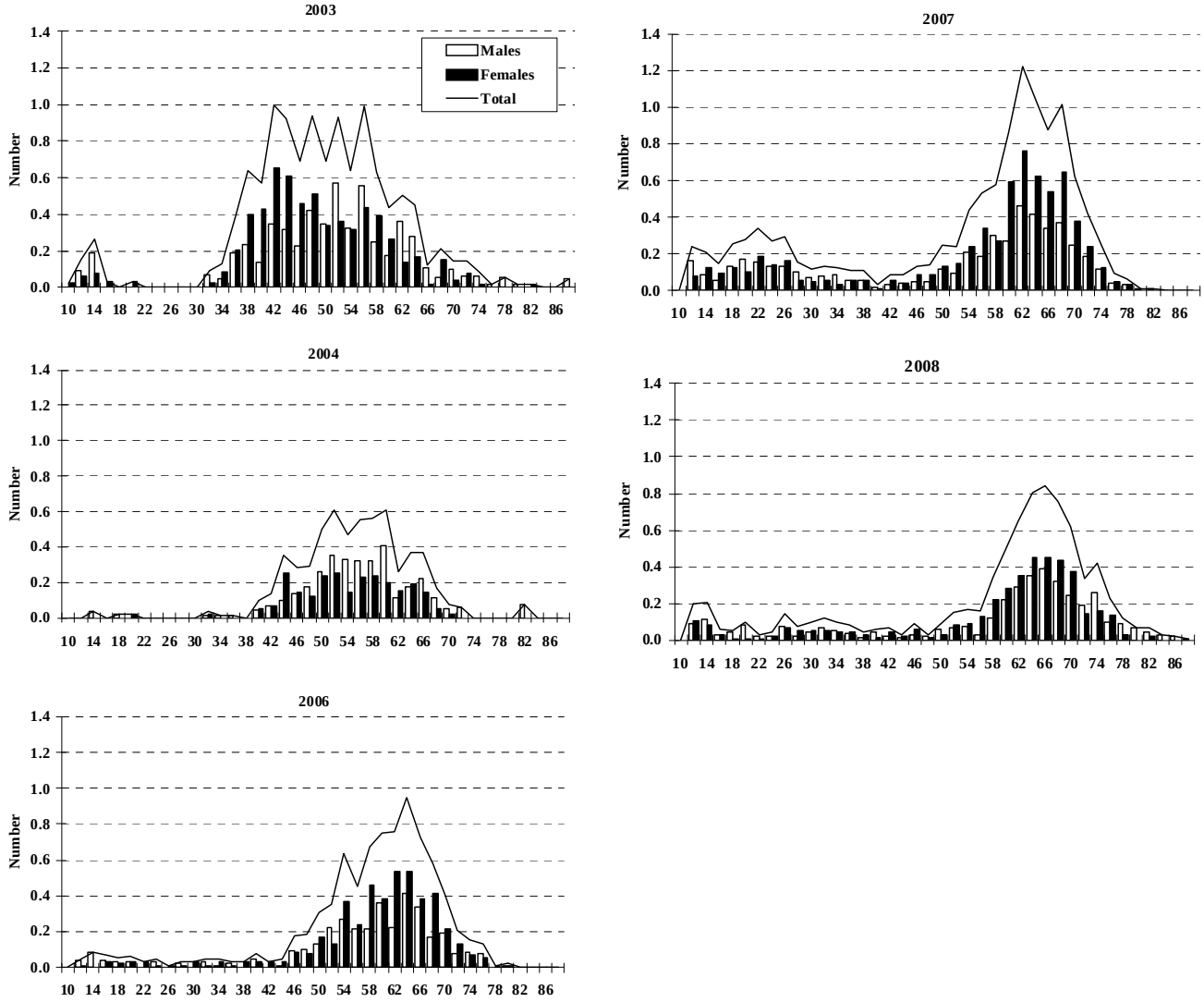


FIGURE 13.- Thorny skate length distribution (cm) in NAFO 3L: 2003-2008. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

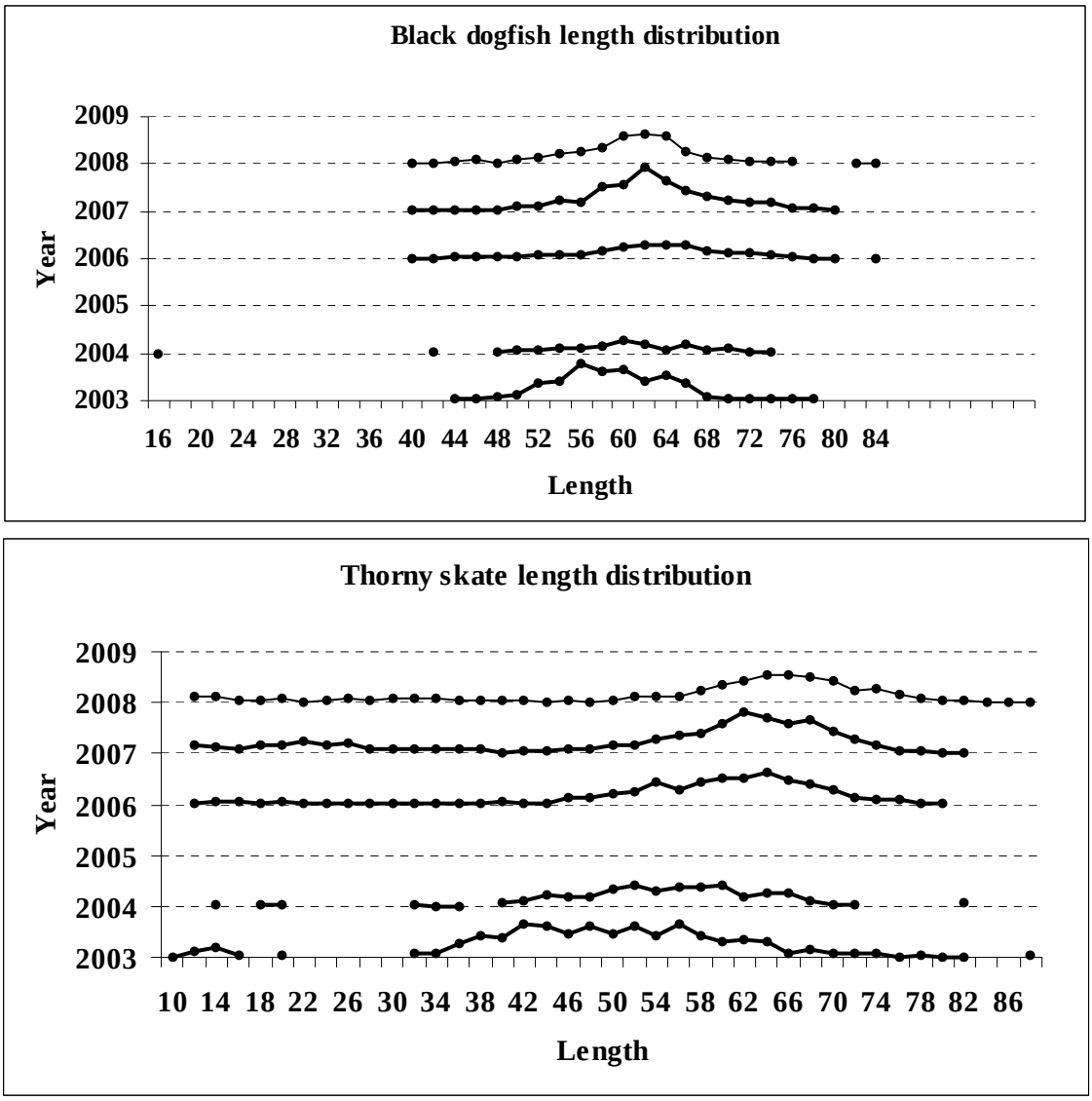


FIGURE 14.- Thorny skate and black length distribution (cm) in NAFO 3L: 2003-2008.

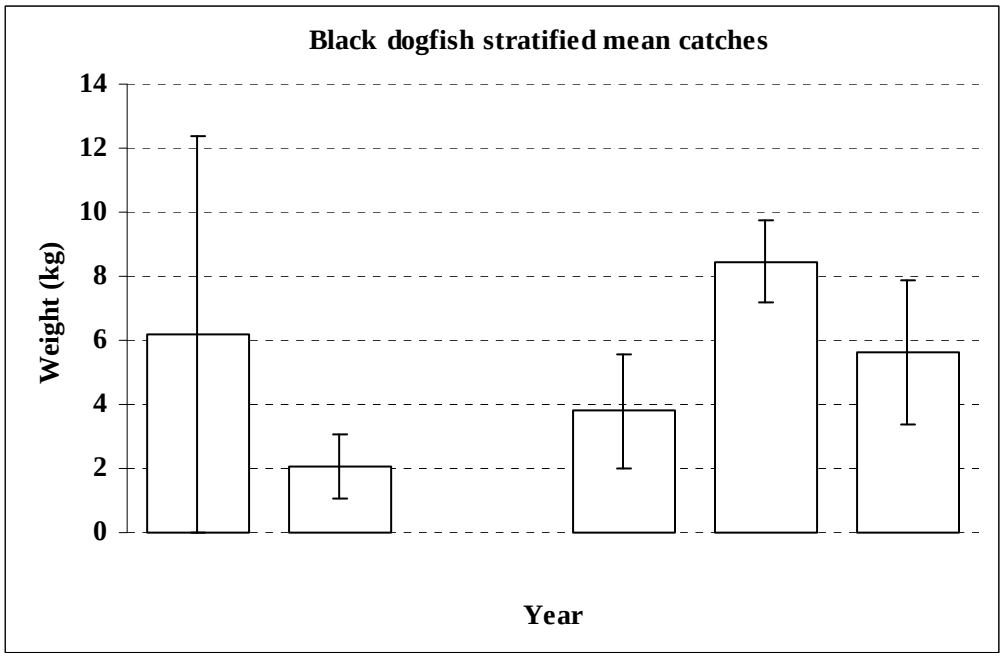


FIGURE 15.- Black dogfish stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

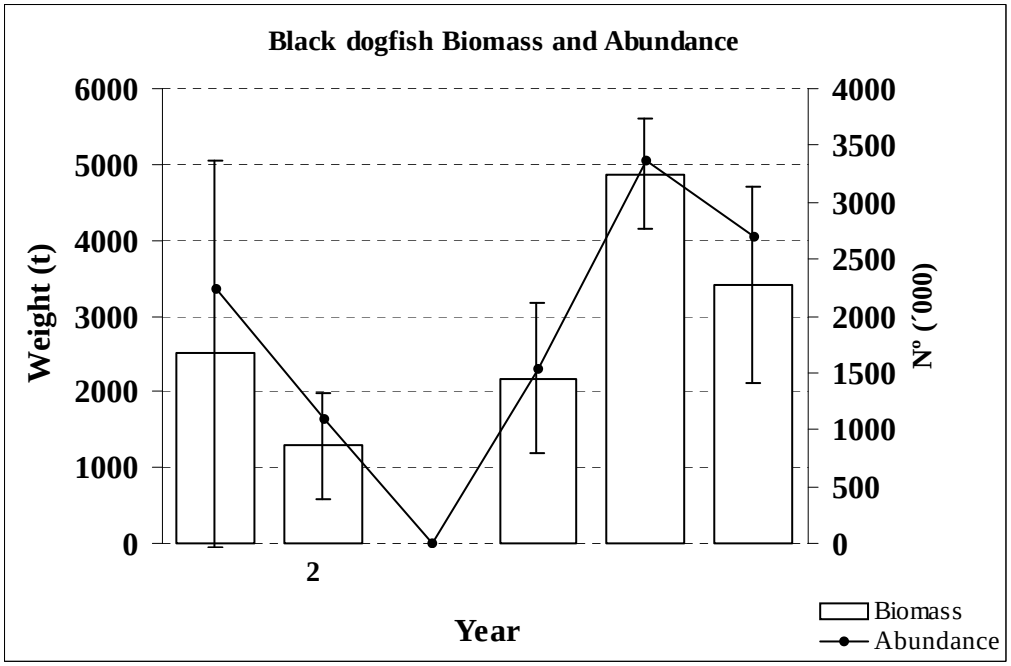


FIGURE 16.- Black dogfish abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2008 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2008.

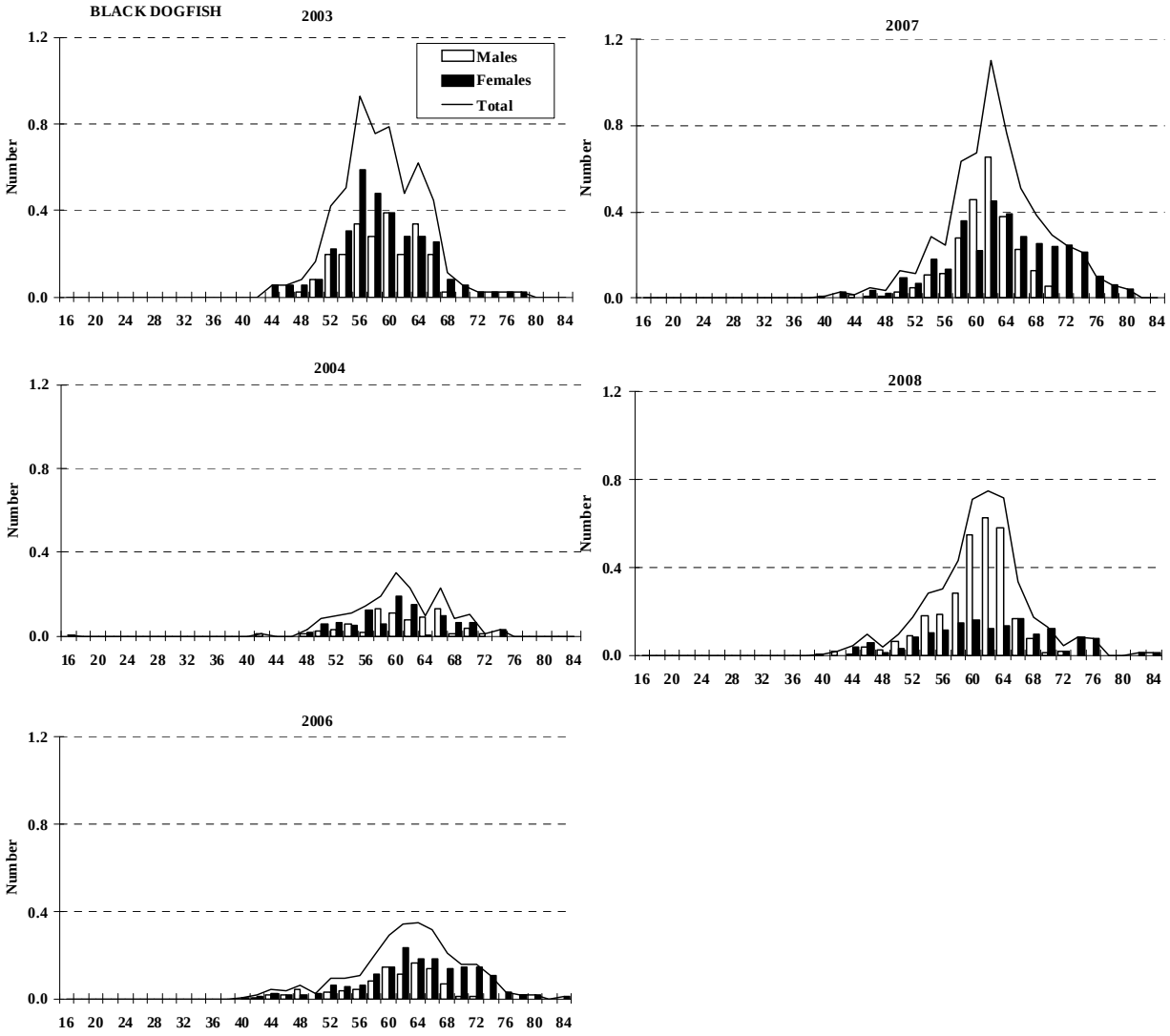


FIGURE 17.- Black dogfish length distribution (cm) in NAFO 3L: 2003-2008. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2008.