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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 2003-2013

by

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Abstract

Since 2003, a stratified random spring bottom trawl survey was conducted by Spain in Division 3L of NAFO Regulatory Area (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 2003-2013.

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

Material and Methods

The Spanish surveys in Div. 3L of NAFO Regulatory Area (Flemish Pass) were initiated by Spain in 2003. The Research vessel *"Vizconde de Eza"* has carried out the entire surveys series following the same procedures and using the same bottom trawl gear *Campelen 1800*. In 2003 and 2004, the survey did not cover all strata adequately. 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*., 2014.

The catch from each haul was sorted out and weighted by species and a randomly selected 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 2003-2013. Length distribution in number per haul stratified mean catches per length, sex and year for these species are presented too. The following formula was used to obtain the biomass from length distribution: $Weight=a(Length+0.5)^b$.

Results

Atlantic Cod (*Gadus morhua* Linnaeus, 1758)

NAFO manages 3 cod stocks in 3L, 3M and 3NO. After a dramatic decline of cod during the eighties and nineties, 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. In 2010, after a decade long moratorium, a cod fishery on the Flemish Cap (Div. 3M) was re-opened but the moratoria (no directed fishery) continues for Div. 3NO and Div. 3L. (NAFO, 2013).

Mean catches and biomass

Table 2 shows the swept area, the tow number, the mean catches and their variance per haul by stratum for Atlantic cod. Table 3 and Figure 1 present the stratified mean catches by stratum and year with their total variance. The entire time series (2003-2013) of biomass and their total variance for Atlantic cod are presented in Table 4 and Figure 2. Estimated parameters values of length-weight relationship are presented in Table 5.

Figure 3 shows a map with the distribution of Atlantic cod catches per haul in 2013 Spanish 3L survey.

Atlantic cod indices show a great variation, due to a few hauls in which the presence of cod was very high, however there is no clear trend along the whole period (2003-2013). 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 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 produced by the tows with a large catch. In 2009 declined again and since then an increasing trend in the biomass can be seen. In 2011 the biomass reaches the highest value in the time series. The highest values in the estimated biomass have been observed in the shallow strata, in a range of depth from 93 to 274 meters. In 2012, the biomass decreases at the same level than in 2008 and increased briefly again in 2013.

Length distribution

Table 6 presents 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 measurements, the sampled catch, the total number of individuals measured in each sample 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 4 and 5 the evolution throughout the period 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 were between 36 and 41 cm (mode = 37 cm). In 2010 the mode was 44 cm with the dominant length between 40 and 47 cm. In 2011 the mode observed was 51 cm and the dominant lengths were between 47 and 55 cm. and in 2012 the dominant lengths were between 34 and 56 cm (mode = 46 cm). In 2013 we have the best presence of individuals between 12-25 cm and there were two modes, one in 28 cm and another in 47cm with the dominant length between 23-31 and 41-58cm.

Roughhead grenadier (*Macrourus berglax* Lacépède, 1802)

The stock structure of this species in the North Atlantic remains unclear because there is little information on the number of different populations that may exist and their relationship. Roughhead grenadier is distributed throughout NAFO Subareas 0 to 3 in depths between 300 and 2 000 m.. 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 of NAFO 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. Roughhead grenadier is not a regulated species (NAFO, 2013).

Mean catches and biomass

Roughhead grenadier haul mean catches by stratum are presented in Table 7; 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 8. The entire time series (2003-2013) of biomass and their SD estimates of this species are shown in Table 9 and length-weight relationships are shown in Table 5.

The indices of roughhead grenadier show no clear trend throughout the whole period, with an increasing in 2004 compared to 2003 and then remains stable (2006-2007). In 2008 the biomass increased, reaching the highest value of the series, but declining afterwards in the period 2009-2012. Biomass reaches the lowest value in the time series in the 2012.There was an increase in 2013, reaching the maximum value since 2010 but still lower than the 2009 (Fig. 6 and 7). Figure 3 shows a map with the distribution of roughhead grenadier catches per haul in 2013 Spanish 3L survey.

Length distribution

Table 10 shows 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 measurements, the sampled catch, the total number of individuals measured in these samples and the range of lengths found. The total catch of this species and the total hauls made in the survey are shown too. In Figures 5 and 8 the evolution along the years can be followed. A slight recruitment can be seen in all period but it was quite good in 2013. The mode observed was 16 cm and the dominant lengths were between 13 and 18.5 cm. Females attain larger lengths than males in all years.

Redfish (*Sebastes spp*. Cuvier, 1829)

There are two species of redfish that have been commercially fished in Div. 3LN, *Sebastes fasciatus* (Acadian redfish) and *S. mentella* (deepwater redfish). The external characteristics are very similar, making them difficult to distinguish, and as a consequence they are reported collectively as "redfish" in the commercial fishery. The redfish stocks in 3LN, 3M, 3O, as well as those in Subarea 2 and Div. 1F+3K are managed by NAFO. From 1998-2010 a moratorium was on 3LN stocks (no directed fishery) and the fishery was reopened in 2010. The stock biomass, female spawning biomass and abundance is higher in 2006 than in the early 1990s (NAFO, 2013).

Mean catches and biomass

Table 11 shows the swept area, the tow number, the mean catches per haul and year and their variance for redfish. Table 12 and Figure 9 present the stratified mean catches per stratum with the total variance per year. Figure 3 shows a map with the distribution of redfish catches per haul in 2013 Spanish 3L survey.

Table 13 and Figure 10 show the biomass estimate per swept area per stratum and their total variance by year and also the estimated abundance. Redfish shows a great annual variability probably due to its pelagic habitat. Redfish biomass indices decreased in 2004, 2007and 2011 with a great decrease in 2013; and they increased in 2006, 2008 and 2009 with a sharp increase in 2010. In 2012, the redfish indices show the greater increasing reaching the highest value of the series (this was due to some hauls in which the presence of redfish was very high). The length-weight relationships are presented in Table 5.

Length distribution

Table 14 presents 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 measurements, the sampled catch, the total number of individuals measured in these samples and the range of lengths found. The total catch of this species and the total hauls made in the survey are also shown. In Figures 5 and 11 the evolution along the years can be followed. The highest proportions of small individuals in the catches (smaller than 20 cm) were found in the period 2007-2009.

Thorny skate (*Amblyraja radiata* Donovan, 1808)

Commercial catches of skates comprise a mix of skate species. However, thorny skate dominates, comprising about 95% of the skate species taken in the Canadian and EU-Spain catches. Thus, the skate fishery on the Grand Banks can be considered a fishery for thorny skate. In 2005, NAFO Fisheries Commission established a TAC of 13 500 t for thorny skate in Div. 3LNO. In 2010 and 2011, the TAC for Div. 3LNO has been reduced to 12 000 t. The TAC was further reduced to 8 500 t for 2012, and to 7 000 t for 2013-2014. Catches for NAFO Div. 3LNO increased in the mid-1980s with the commencement of a directed fishery for thorny skate (NAFO, 2013).

Mean catches and biomass

Table 15 shows the swept area, the tow number, the mean catches per haul and year and their variance for thorny skate. Table 16 presents the length-weight relationships. Table 17 and Figure 12 present the stratified mean catches per stratum with the total variance per year. Table 18 and Figure 13 present the biomass per swept area by stratum and year, their total variance per year and the abundance index. The indices of the thorny skate decreased from 2003 to 2004, increased in 2006-2007 and decreased again in the period 2008-2011. In 2012 the indices of the thorny skate increased and they slight decreased again in the 2013. Figure 3 shows a map with the distribution of thorny skate catches per haul in 2013 Spanish 3L survey.

Length distribution

Table 19 presents 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 measurements, the sampled catch, the total number of individuals measured in these samples 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 14 and 15, the evolution along the years can be followed. The highest proportion of small thorny skate in the catches was in 2007. The mode observed was 68 cm and the dominant lengths were between 67 and 77 cm.

Black dogfish (*Centroscyllium fabricii* Reinhardt, 1825)

Black dogfish is present in all Divisions, but is more abundant in Div. 3NO and in depths greater 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 (2003-2013) 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 2008, 2009 and 2012, increasing again in 2010, 2011 being the second and third values of the time series. In 2003, the catches occurred only in two strata (745 and 749), in which the catches were much different, what explain why the variance in that year is so large. In 2013, the indices of black dogfish increased again (Fig. 16 and 17). Figure 3 shows a map with the distribution of black dogfish catches per haul in 2013 Spanish 3L survey.

Length distribution

Table 23 presents 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 measurements, the sampled catch, the total number of individuals measured in these samples 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 15 and 18 the evolution throughout the years can be followed.

There is no presence of small individual (smaller 38 cm). Size compositions are mainly between 50 and 80 cm of length. In 2013 the observed mode was 64 cm and the dominant lengths were between 60 and 67 cm.

References

ATKINSON, D. B. 1991. Relationships Between Pre-anal Fin Length and Total Length of Roughhead Grenadier (*Macrourus berglax* Lacépède) in the Northwest Atlantic. J. Northw. Atlan. Fish. Sci., **11**: 7-9

GONZÁLEZ-COSTAS, F., D. GONZÁLEZ-TRONCOSO, M. CASAS, and G. RAMILO. 2006. Spiny Dogfish (*Squalus acanthias*) and Black Dogfish (*Centroscyllium fabricii*) Spanish Data (Surveys and Fishery) in NAFO Divisions 3LMNO. *NAFO SCR Doc*., No. 30, Serial No. N5250, 10 p.

NAFO, 2013. Report of Scientific Council Meeting, 7-20 June 2013.

ROMÁN, E., C. GONZÁLEZ-IGLESIAS and D. GONZÁLEZ-TRONCOSO. 2014. Results for the Spanish Survey in the NAFO Regulatory Area of Division 3L for the period 2003-2013. *NAFO SCR Doc*., No. XX, Serial No NXXXX.

TABLE 1.- Spanish bottom trawl surveys in NAFO Division 3L for the period 2003-2013.

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
2010	R/V "*Vizconde de Eza*"	97	119-1462	24	July 25 - August 14
2011	R/V "*Vizconde de Eza"*	89	115-1419	24	August 10 - August 24
2012	R/V "*Vizconde de Eza"*	98	112-1478	24	July 30 - August 18
2013	R/V "*Vizconde de Eza"*	100	117-1420	24	July 30 - August 19

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 2009-2013, on board R/V "*Vizconde de Eza*".

Stratum	2009				2010				2011				2012				2013			
	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD
385	0.0225	2	5.285	3.514	0.0225	2	0.775	1.096	0.0229	2	93.750	118.723	0.0225	2	4.820	2.871	0.0229	2	4.556	4.144
387	0.0439	4	23.204	40.440	0.0458	4	3.433	2.594	0.0450	4	36.505	32.228	0.0450	4	6.760	4.899	0.0450	4	92.938	97.705
388	0.0555	5	7.413	3.853	0.0570	5	61.988	121.458	0.0563	5	15.241	14.829	0.0570	5	162.020	264.788	0.0570	5	91.360	68.284
389	0.0803	7	40.874	54.955	0.0795	7	150.908	266.990	0.0675	6	26.796	42.096	0.0799	7	34.169	26.422	0.0791	7	74.413	71.762
390	0.1373	12	22.441	43.094	0.1249	11	37.143	51.671	0.1009	9	217.889	231.959	0.1354	12	43.245	27.872	0.1358	12	42.393	23.638
391	0.0458	4	65.264	62.051	0.0454	4	144.075	119.143	0.0458	4	150.275	91.993	0.0458	4	44.280	47.163	0.0450	4	14.288	19.423
392	0.0229	2	0.063	0.089	0.0225	2	70.680	89.265	0.0229	2	3.268	3.129	0.0225	2	13.470	4.992	0.0225	2	27.297	2.626
729	0.0341	3	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	0.0341	3	0.759	1.314
730	0.0338	3	0.000	0.000	0.0334	3	0.000	0.000	0.0334	3	0.000	0.000	0.0338	3	0.000	0.000	0.0334	3	0.000	0.000
731	0.0341	3	0.000	0.000	0.0338	3	0.247	0.225	0.0334	3	0.000	0.000	0.0341	3	0.000	0.000	0.0334	3	0.173	0.300
732	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000	0.0454	4	0.000	0.000	0.0454	4	0.000	0.000	0.0450	4	0.000	0.000
733	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000	0.0454	4	0.545	0.642	0.0454	4	0.000	0.000	0.0450	4	5.008	7.845
734	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0233	2	0.000	0.000	0.0221	2	0.000	0.000
741	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0218	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000
742	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000
743	0.0203	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000
744	0.0210	2	0.000	0.000	0.0229	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000
745	0.0559	5	0.000	0.000	0.0563	5	0.000	0.000	0.0446	4	0.000	0.000	0.0570	5	0.000	0.000	0.0559	5	0.000	0.000
746	0.0668	6	0.000	0.000	0.0679	6	0.000	0.000	0.0566	5	0.000	0.000	0.0675	6	0.000	0.000	0.0675	6	0.000	0.000
747	0.1118	10	0.000	0.000	0.1125	10	0.000	0.000	0.0893	8	0.000	0.000	0.1121	10	0.000	0.000	0.1125	10	0.000	0.000
748	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000
749	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000
750	0.0791	7	0.000	0.000	0.0900	8	0.000	0.000	0.0668	6	0.000	0.000	0.0885	8	0.000	0.000	0.0896	8	0.000	0.000
751	0.0338	3	0.000	0.000	0.0225	2	0.000	0.000	0.0334	3	0.000	0.000	0.0218	2	0.000	0.000	0.0446	4	0.000	0.000

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

TABLE 3.- Stratified mean catches (Kg) of **Atlantic cod** by stratum and year (2003-2013) and SD. Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	7.26	53.10	-	210.34	98.53	713.96	623.63	91.45	11062.50	568.76	537.61
387	1123.84	482.56	-	101.12	509.82	1378.75	5940.16	878.72	9345.28	1730.43	23792.19
388	2809.59	468.74	-	2509.00	2653.87	6663.55	2646.51	22129.72	5441.04	57841.14	32615.52
389	429.34	259.59	-	5386.31	2118.59	15536.35	20804.94	76812.24	13639.08	17391.88	37876.07
390	0.00	0.00	-	65.94	1115.80	7076.10	18289.28	30271.32	177579.44	35245.01	34550.09
391	47.00	0.00	-	4043.18	3153.47	96519.44	18404.45	40629.15	42377.55	12486.96	4029.29
392	58.00	1916.68	-	296.53	2027.75	0.00	9.14	10248.60	473.79	1953.15	3958.07
729	234.36	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	141.11
730	0.00	0.00	-	0.00	0.00	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	53.28	0.00	0.00	37.44
732	0.00	0.00	-	0.00	0.00	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	0.00	127.59	0.00	1171.76
734	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
741	0.00	0.00	-	0.00	0.00	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	0.00	0.00	0.00	0.00
743	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
744	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
745	0.00	0.00	-	0.00	0.00	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	0.00	0.00	0.00	0.00
747	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
748	0.00	0.00	-	0.00	0.00	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	0.00	0.00	0.00	0.00
750	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
751	n.s	n.s	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	9548.87	3287.70	-	12612.40	11887.83	127916.23	66718.10	181114.48	260046.27	127217.33	138709.14
	2.13	0.53	-	1.94	1.83	19.72	10.28	27.92	40.09	19.61	21.38
SD	0.57	0.30	-	0.55	0.42	13.89	2.75	9.17	10.15	6.72	3.47

TABLE 4.- Survey estimates (by the swept area method) of **Atlantic cod** biomass (t.) by stratum and year and their SD 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 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	1	5	-	18	9	62	55	8	967	51	47
387	98	45	-	9	45	127	542	77	831	154	2115
388	253	45	-	222	236	596	238	1941	484	5074	2861
389	38	23	-	474	188	1394	1815	6763	1212	1524	3351
390	0	0	-	6	99	609	1599	2667	15844	3124	3054
391	4	0	-	359	280	8509	1609	3582	3705	1092	358
392	5	179	-	26	180	0	1	911	41	174	352
729	22	0	-	0	0	0	0	0	0	0	12
730	0	0	-	0	0	0	0	0	0	0	0
731	423	9	-	0	10	3	0	5	0	0	3
732	0	0	-	0	0	0	0	0	0	0	0
733	n.s	0	-	0	9	0	0	0	11	0	104
734	n.s	0	-	0	0	0	0	0	0	0	0
741	0	0	-	0	0	0	0	0	0	0	0
742	0	0	-	0	0	0	0	0	0	0	0
743	n.s	0	-	0	0	0	0	0	0	0	0
744	n.s	0	-	0	0	0	0	0	0	0	0
745	0	0	-	0	0	0	0	0	0	0	0
746	0	0	-	0	0	0	0	0	0	0	0
747	n.s	0	-	0	0	0	0	0	0	0	0
748	0	0	-	0	0	0	0	0	0	0	0
749	0	0	-	0	0	0	0	0	0	0	0
750	n.s	0	-	0	0	0	0	0	0	0	0
751	n.s	n.s	-	0	0	0	0	0	0	0	0
TOTAL	844	306	-	1114	1057	11300	5859	15953	23095	11192	12258
SD	222	180	-	315	245	7745	1556	5265	5833	3877	1984

Table 5.- Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2006-2013 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
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
2010	All	$W = 0.0086\ L^{3.0302}$	756	0.980	All	$W = 0.1006\ L^{2.9369}$	1539	0.991	All	$W = 0.0110\ L^{3.0593}$	808	0.9859
	Males	$W = 0.0076\ L^{3.0636}$	364	0.980	Males	$W = 0.0909\ L^{2.9770}$	547	0.984	Males	$W = 0.0153\ L^{2.9565}$	372	0.9754
	Females	$W = 0.0095\ L^{3.0027}$	392	0.979	Females	$W = 0.1071\ L^{2.9152}$	947	0.990	Females	$W = 0.0161\ L^{2.9484}$	397	0.9706
2011	All	$W = 0.0090\ L^{3.0101}$	1421	0.9874	All	$W = 0.0962\ L^{2.9550}$	1545	0.9899	All	$W = 0.0105\ L^{3.0803}$	1218	0.9882
	Males	$W = 0.0102\ L^{2.9790}$	682	0.9852	Males	$W = 0.1018\ L^{2.9403}$	543	0.9796	Males	$W = 0.0129\ L^{3.0158}$	529	0.9836
	Females	$W = 0.0082\ L^{3.0334}$	739	0.9892	Females	$W = 0.1169\ L^{2.8873}$	913	0.9884	Females	$W = 0.0109\ L^{3.0768}$	559	0.9855
2012	All	$W = 0.0106\ L^{2.9627}$	878	0.982	All	$W = 0.1070\ L^{2.9148}$	1607	0.988	All	$W = 0.0126\ L^{3.0228}$	978	0.9847
	Males	$W = 0.0109\ L^{2.9573}$	403	0.982	Males	$W = 0.1008\ L^{2.9374}$	609	0.980	Males	$W = 0.0135\ L^{2.9979}$	476	0.9856
	Females	$W = 0.0123\ L^{2.9243}$	474	0.980	Females	$W = 0.1081\ L^{2.9117}$	934	0.988	Females	$W = 0.0157\ L^{2.9616}$	491	0.9806
2013	All	$W = 0.0072\ L^{3.0592}$	1717	0.992	All	$W = 0.0979\ L^{2.9309}$	1784	0.991	All	$W = 0.0080\ L^{3.1741}$	1130	0.99
	Males	$W = 0.0071\ L^{3.0636}$	785	0.992	Males	$W = 0.0919\ L^{2.9562}$	643	0.985	Males	$W = 0.0130\ L3^{.0249}$	497	0.9803
	Females	$W = 0.0073\ L^{3.0554}$	932	0.993	Females	$W = 0.0995\ L^{2.9248}$	1036	0.991	Females	$W = 0.0132\ L3^{.0237}$	522	0.9822

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: 2006-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2006				2007				2008				2009			
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
<12	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	0.01	0.00	0.00	0.01	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	0.00	0.00	0.00	0.00	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	0.00	0.01	0.00	0.01	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	0.00	0.03	0.00	0.03	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	0.03	0.00	0.00	0.03	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	0.05	0.02	0.00	0.08	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	0.08	0.10	0.00	0.18	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	0.09	0.16	0.00	0.25	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	0.09	0.19	0.00	0.27	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	0.13	0.19	0.00	0.32	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	0.20	0.11	0.00	0.30	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	0.15	0.10	0.00	0.25	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	0.12	0.11	0.00	0.23	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	0.11	0.12	0.00	0.23	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	0.05	0.12	0.00	0.17	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	0.12	0.07	0.00	0.18	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	0.13	0.10	0.00	0.23	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	0.11	0.13	0.00	0.24	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	0.03	0.09	0.00	0.12	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	0.03	0.05	0.00	0.08	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	0.08	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	0.00	0.04	0.00	0.04	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	0.00	0.00	0.00	0.00	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	0.01	0.00	0.00	0.01	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	0.00	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	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	0.01	0.00	0.01	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	0.00	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	0.00	0.01	0.00	0.01	0.01	0.02	0.00	0.03
70	0.00	0.00	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.01	0.00	0.01
74	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01
76	0.00	0.00	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
78	0.00	0.01	0.00	0.01	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	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
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
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
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	0.00	0.00	0.00	0.00
90	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
92	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	1.57	1.82	0.00	3.38	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:				22				32				34				32
Nº Ind.:	143	167	0	310	107	119	0	226	739	827	0	1566	580	781	0	1361
Sampled catch:				176				168				1814				957
Range:				13-79				12-76				12-74				13-77
Total catch:				176				168				1814				957
Total valid hauls:				100				94				100				98

TABLE 6 (cont.).- Atlantic cod length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2010				2011				2012				2013			
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
<12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.06	0.00	0.18
14	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.28	0.41	0.00	0.68
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.04	0.54	0.41	0.00	0.95
18	0.03	0.00	0.00	0.03	0.00	0.01	0.00	0.01	0.07	0.04	0.00	0.11	0.19	0.22	0.00	0.41
20	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.03	0.01	0.00	0.00	0.01	0.22	0.29	0.00	0.51
22	0.01	0.00	0.00	0.01	0.04	0.05	0.00	0.08	0.02	0.01	0.00	0.03	0.33	0.45	0.00	0.78
24	0.07	0.07	0.00	0.13	0.07	0.16	0.00	0.23	0.05	0.03	0.00	0.08	0.66	0.63	0.00	1.30
26	0.21	0.24	0.00	0.45	0.37	0.31	0.00	0.68	0.06	0.04	0.00	0.10	0.67	0.60	0.00	1.27
28	0.49	0.88	0.00	1.37	0.46	0.66	0.00	1.12	0.15	0.03	0.00	0.18	0.71	0.65	0.00	1.36
30	0.99	1.06	0.00	2.05	0.58	0.71	0.00	1.29	0.14	0.06	0.00	0.20	0.60	0.60	0.00	1.21
32	1.34	1.23	0.00	2.57	0.67	0.78	0.00	1.45	0.15	0.07	0.00	0.22	0.33	0.43	0.00	0.76
34	0.87	1.07	0.00	1.95	0.81	0.72	0.00	1.53	0.39	0.33	0.00	0.72	0.28	0.29	0.00	0.58
36	1.27	1.35	0.00	2.62	0.68	0.75	0.00	1.43	0.44	0.58	0.00	1.03	0.41	0.36	0.00	0.78
38	1.31	1.44	0.00	2.75	0.71	0.75	0.00	1.46	0.68	0.98	0.00	1.66	0.58	0.46	0.00	1.05
40	1.65	2.08	0.00	3.72	0.76	1.09	0.00	1.85	0.73	0.82	0.00	1.55	0.50	0.35	0.00	0.86
42	1.91	2.12	0.00	4.02	0.95	0.86	0.00	1.82	0.71	1.08	0.00	1.79	0.54	0.67	0.00	1.21
44	1.79	2.52	0.00	4.31	0.99	1.29	0.00	2.28	0.75	0.85	0.00	1.60	0.73	0.98	0.00	1.71
46	1.60	2.24	0.00	3.85	1.18	1.61	0.00	2.79	0.91	0.97	0.00	1.88	0.86	0.76	0.00	1.62
48	1.17	1.48	0.00	2.65	1.41	2.14	0.00	3.55	0.64	0.97	0.00	1.61	0.75	0.80	0.00	1.54
50	0.51	0.95	0.00	1.46	2.26	2.42	0.00	4.68	0.63	0.79	0.00	1.42	0.52	0.75	0.00	1.27
52	0.28	0.43	0.00	0.71	1.86	2.21	0.00	4.07	0.48	0.62	0.00	1.10	0.50	0.62	0.00	1.11
54	0.18	0.31	0.00	0.49	1.34	2.00	0.00	3.34	0.45	0.54	0.00	0.99	0.36	0.72	0.00	1.09
56	0.05	0.21	0.00	0.25	0.71	1.05	0.00	1.75	0.55	0.48	0.00	1.03	0.42	0.44	0.00	0.86
58	0.12	0.13	0.00	0.26	0.49	0.62	0.00	1.11	0.22	0.22	0.00	0.45	0.29	0.47	0.00	0.76
60	0.16	0.06	0.00	0.22	0.36	0.32	0.00	0.68	0.16	0.33	0.00	0.48	0.17	0.31	0.00	0.49
62	0.05	0.07	0.00	0.12	0.08	0.22	0.00	0.30	0.10	0.19	0.00	0.29	0.19	0.33	0.00	0.52
64	0.05	0.01	0.00	0.06	0.09	0.06	0.00	0.15	0.05	0.17	0.00	0.22	0.12	0.17	0.00	0.28
66	0.02	0.05	0.00	0.07	0.07	0.05	0.00	0.12	0.02	0.12	0.00	0.14	0.10	0.12	0.00	0.21
68	0.04	0.01	0.00	0.05	0.02	0.09	0.00	0.11	0.04	0.04	0.00	0.08	0.10	0.09	0.00	0.19
70	0.01	0.00	0.00	0.01	0.00	0.05	0.00	0.05	0.01	0.06	0.00	0.07	0.02	0.04	0.00	0.06
72	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.09	0.00	0.13
74	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.04	0.04	0.00	0.09
76	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	0.00	0.00	0.01
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	0.01	0.00	0.00	0.01
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	0.01	0.01	0.00	0.02
82	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
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	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	0.00	0.01	0.00	0.01
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	0.00	0.00	0.00	0.00
90	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
92	0.00	0.01	0.00	0.01	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	16.19	20.07	0.00	36.25	17.01	21.02	0.00	38.03	8.65	10.47	0.01	19.14	12.24	13.65	0.00	25.89
Nº samples:				36				34				35				41
Nº Ind.:	1014	1265	0	2279	1147	1440	0	2587	603	693	1	1297	1085	1200	0	2285
Sampled catch:				2509				3141				1809				2002
Range:				12-93				19-85				5-82				11-87
Total catch:				2509				3141				1809				2002
Total valid hauls:				97				89				98				100

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 2009-2013, on board R/V "*Vizconde de Eza*".

Stratum	2009				2010				2011				2012				2013			
	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD
385	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0229	2	1.010	1.428	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000
387	0.0439	4	30.045	16.013	0.0458	4	14.399	12.704	0.0450	4	11.304	9.250	0.0450	4	16.012	11.119	0.0450	4	48.039	29.999
388	0.0555	5	27.627	27.428	0.0570	5	17.174	8.563	0.0563	5	5.022	4.969	0.0570	5	14.019	22.081	0.0570	5	11.737	9.670
389	0.0803	7	31.105	63.627	0.0795	7	8.231	10.443	0.0675	6	4.711	3.126	0.0799	7	11.893	9.022	0.0791	7	7.694	11.153
390	0.1373	12	4.648	14.283	0.1249	11	1.071	3.295	0.1009	9	2.856	7.168	0.1354	12	0.000	0.000	0.1358	12	0.418	0.995
391	0.0458	4	72.878	56.298	0.0454	4	169.525	25.560	0.0458	4	153.179	92.811	0.0458	4	21.670	8.743	0.0450	4	6.940	6.438
392	0.0229	2	60.934	78.701	0.0225	2	35.050	15.203	0.0229	2	83.417	29.674	0.0225	2	73.339	76.293	0.0225	2	462.715	55.388
729	0.0341	3	9.991	5.382	0.0338	3	10.817	4.348	0.0338	3	3.398	2.102	0.0338	3	23.722	12.954	0.0341	3	13.044	2.954
730	0.0338	3	75.453	99.963	0.0334	3	26.400	4.084	0.0334	3	66.456	55.464	0.0338	3	27.264	5.665	0.0334	3	16.433	3.745
731	0.0341	3	4.980	1.654	0.0338	3	10.508	7.656	0.0334	3	2.002	1.506	0.0341	3	5.244	2.400	0.0334	3	5.861	7.211
732	0.0450	4	8.289	3.314	0.0450	4	16.060	6.489	0.0454	4	2.393	2.786	0.0454	4	3.022	2.324	0.0450	4	9.399	5.783
733	0.0450	4	19.108	13.978	0.0450	4	8.785	9.702	0.0454	4	6.622	8.721	0.0454	4	9.322	10.885	0.0450	4	25.366	26.819
734	0.0218	2	28.777	12.760	0.0225	2	65.625	48.826	0.0225	2	8.413	1.874	0.0233	2	20.968	0.803	0.0221	2	51.715	2.849
741	0.0221	2	11.334	6.316	0.0225	2	14.350	3.606	0.0218	2	7.707	9.880	0.0218	2	5.764	2.452	0.0221	2	26.100	18.526
742	0.0214	2	3.425	1.803	0.0225	2	3.870	1.987	0.0225	2	14.545	14.221	0.0206	2	6.851	3.796	0.0218	2	4.829	4.554
743	0.0203	2	13.278	13.438	0.0225	2	30.937	37.283	0.0221	2	18.488	1.660	0.0206	2	5.421	7.609	0.0218	2	23.750	18.314
744	0.0210	2	8.208	6.495	0.0229	2	13.319	1.031	0.0221	2	6.254	3.743	0.0221	2	8.725	9.086	0.0221	2	27.217	13.266
745	0.0559	5	3.787	2.256	0.0563	5	7.959	3.864	0.0446	4	2.802	4.240	0.0570	5	1.932	1.671	0.0559	5	7.092	4.649
746	0.0668	6	23.474	20.537	0.0679	6	13.030	7.624	0.0566	5	8.981	7.193	0.0675	6	14.447	14.048	0.0675	6	19.411	13.114
747	0.1118	10	33.180	25.868	0.1125	10	36.785	18.008	0.0893	8	22.273	17.958	0.1121	10	19.457	7.563	0.1125	10	22.433	9.574
748	0.0229	2	92.330	127.477	0.0225	2	50.350	51.548	0.0221	2	25.955	33.074	0.0225	2	106.350	134.562	0.0225	2	50.520	62.607
749	0.0225	2	13.700	9.334	0.0229	2	20.482	26.189	0.0221	2	27.713	30.670	0.0221	2	9.800	8.061	0.0225	2	16.950	0.495
750	0.0791	7	16.895	14.145	0.0900	8	12.763	11.150	0.0668	6	9.292	4.047	0.0885	8	18.823	14.451	0.0896	8	6.988	4.947
751	0.0338	3	88.193	144.495	0.0225	2	22.150	8.980	0.0334	3	14.880	6.137	0.0218	2	34.850	33.022	0.0446	4	9.238	3.941

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

TABLE 8.- Stratified mean catches (Kg) of **roughhead grenadier** by stratum and year (2003-2013) and SD. Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	0.00	0.00	-	0.00	0.00	0.00	0.00	0.00	119.18	0.00	0.00
387	0.00	15356.54	-	8906.24	11773.44	5201.92	7691.52	3686.21	2893.70	4099.14	12297.98
388	0.00	15458.10	-	9426.94	13445.76	5374.85	9862.70	6131.05	1792.71	5004.78	4190.04
389	0.00	954.38	-	725.69	1565.18	9674.64	15832.37	4189.80	2397.73	6053.54	3916.39
390	456.40	5.43	-	0.00	0.00	472.70	3787.71	872.79	2327.28	0.00	340.94
391	4.70	4.94	-	50230.55	24400.05	70203.05	20551.46	47806.05	43196.41	6110.94	1957.08
392	565.50	29094.25	-	17113.63	18842.75	8435.38	8835.43	5082.25	12095.47	10634.08	67093.68
729	7021.50	5482.35	-	4680.44	4927.20	3709.46	1858.39	2011.90	632.09	4412.23	2426.25
730	17178.50	5731.55	-	9055.90	13834.26	5970.29	12827.07	4488.00	11297.58	4634.82	2793.67
731	758.16	2257.20	-	2270.52	3095.93	3095.93	1075.61	2269.73	432.36	1132.78	1266.05
732	7946.40	9122.19	-	5119.88	2575.96	4976.90	1914.82	3709.74	552.67	698.08	2171.17
733	n.s	3639.48	-	5487.30	4470.26	5601.67	4471.16	2055.69	1549.49	2181.41	5935.70
734	n.s	10075.05	-	6015.20	3580.20	4678.66	4402.88	10040.63	1287.19	3208.03	7912.32
741	870.00	105.53	-	1755.70	465.00	1035.90	1133.40	1435.00	770.65	576.35	2610.00
742	1561.60	300.80	-	1339.68	927.55	1079.10	219.20	247.68	930.85	438.46	309.02
743	n.s	1338.50	-	539.27	1512.97	1300.93	677.18	1577.79	942.89	276.45	1211.25
744	n.s	168.30	-	1014.09	2241.69	3872.22	541.70	879.05	412.73	575.85	1796.29
745	6106.24	2018.40	-	2866.88	1261.09	4970.83	1317.95	2769.59	975.10	672.20	2468.16
746	25009.60	10272.36	-	16372.53	13565.94	12042.24	9201.61	5107.56	3520.47	5663.35	7609.05
747	n.s	31585.71	-	30630.47	45257.17	20791.04	24022.61	26632.56	16125.29	14086.51	16241.27
748	8900.82	3579.89	-	10799.28	5331.80	34557.06	14680.47	8005.65	4126.85	16909.65	8032.68
749	18295.20	5783.40	-	3267.18	3616.20	5978.95	1726.20	2580.67	3491.84	1234.80	2135.70
750	n.s	31553.00	-	9377.25	10850.99	6636.90	9393.86	7096.23	5166.44	10465.52	3885.26
751	n.s	n.s	-	973.82	5597.91	2069.59	20196.12	5072.35	3407.52	7980.65	2115.39
TOTAL	94674.62	183887.34	-	197968.44	193139.30	221730.20	176221.39	153747.96	120444.46	107049.61	160715.33
$(\bar{y})$	21.16	29.38	-	30.52	29.77	34.18	27.17	23.70	18.57	16.50	24.77
SD	3.38	5.27	-	7.41	4.86	6.12	4.97	1.71	2.51	2.92	1.75

TABLE 9.- Survey estimates (by the swept area method) of **roughhead grenadier** biomass (t.) by stratum and year and their SD 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 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	0	0	-	0	0	0	0	0	10	0	0
387	0	1437	-	792	1047	478	701	322	257	364	1093
388	0	1472	-	832	1195	481	889	538	159	439	368
389	0	85	-	64	139	868	1381	369	213	531	346
390	41	0	-	0	0	41	331	77	208	0	30
391	0	0	-	4465	2169	6189	1797	4214	3777	534	174
392	49	2722	-	1496	1675	763	772	452	1058	945	5964
729	669	496	-	416	438	330	163	179	56	392	213
730	1553	518	-	833	1230	555	1140	403	1016	412	251
731	66	194	-	200	275	281	95	202	39	100	114
732	706	869	-	460	229	446	170	330	49	62	193
733	n.s	331	-	484	397	520	397	183	137	192	528
734	n.s	995	-	535	318	423	405	893	114	276	715
741	77	10	-	161	41	99	102	128	71	53	236
742	134	25	-	117	82	103	21	22	83	43	28
743	n.s	143	-	48	134	128	67	140	85	27	111
744	n.s	17	-	89	206	350	52	77	37	52	162
745	537	190	-	251	112	448	118	246	87	59	221
746	2242	913	-	1455	1226	1133	827	451	311	503	676
747	n.s	3082	-	2739	4023	1945	2150	2367	1445	1256	1444
748	818	360	-	993	474	3178	1284	712	373	1503	714
749	1654	523	-	286	321	559	153	226	316	112	190
750	n.s	3506	-	840	959	629	831	631	464	946	347
751	n.s	n.s	-	86	498	201	1795	451	306	734	190
TOTAL	8546	17887	-	17641	17190	20148	15641	13612	10672	9535	14308
SD	1340	3240	-	4271	2799	3534	2844	972	1466	1676	1010

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: 2006-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2006				2007				2008				2009			
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
1.5	0.00	0.00	0.04	0.04	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	0.07	0.04	0.02	0.13	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	0.61	0.16	0.14	0.91	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	0.14	0.00	0.00	0.14	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	0.12	0.15	0.00	0.27	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	0.91	0.71	0.00	1.63	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	0.62	0.48	0.00	1.10	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	0.46	0.50	0.00	0.97	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	0.95	0.87	0.00	1.82	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	0.87	0.98	0.00	1.84	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	1.36	1.26	0.00	2.62	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	1.83	1.78	0.01	3.61	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	1.66	1.75	0.01	3.41	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	1.91	1.77	0.00	3.67	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	2.21	1.64	0.00	3.85	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	2.19	1.86	0.00	4.04	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	3.45	1.88	0.01	5.34	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	2.99	2.03	0.00	5.02	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	1.73	2.94	0.00	4.66	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	0.91	2.50	0.00	3.41	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	0.51	2.60	0.00	3.11	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	0.10	1.73	0.00	1.83	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	0.03	1.44	0.00	1.47	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	0.01	0.94	0.00	0.95	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	0.00	0.84	0.00	0.84	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	0.63	0.00	0.63	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	0.25	0.00	0.25	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	0.00	0.31	0.00	0.31	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	0.00	0.20	0.00	0.20	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	0.10	0.00	0.10	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	0.13	0.00	0.13	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	0.09	0.00	0.09	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	0.04	0.00	0.04	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	0.03	0.00	0.03	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	0.01	0.00	0.01	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	0.05	0.00	0.05	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	0.01	0.00	0.01	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	0.01	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	0.00	0.00	0.00	0.00
40.5	0.00	0.00	0.00	0.00	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	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
Total	25.64	32.68	0.23	58.54	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:				83				71				87				81
Nº Ind.:	2107	2423	25	4555	1589	2246	69	3904	2022	3019	176	5217	1409	2319	105	3833
Sampled catch:				2985				2712				3287				2541
Range:				1.5-39				2-41				1.5-42.5				2.0-41.5
Total catch:				2985				2712				3287				2543
Total valid hauls:				100				94				100				98

TABLE 10 (cont).- Roughhead grenadier length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2010				2011				2012				2013			
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
1.5	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
2.5	0.03	0.00	0.26	0.29	0.02	0.00	0.17	0.19	0.00	0.00	0.24	0.24	0.01	0.03	1.12	1.15
3.5	0.07	0.05	0.33	0.46	0.00	0.01	1.41	1.42	0.00	0.02	1.01	1.04	0.24	0.09	4.47	4.80
4.5	0.04	0.09	0.01	0.15	0.03	0.03	0.07	0.14	0.10	0.03	0.03	0.16	0.17	0.20	0.24	0.60
5.5	0.29	0.20	0.00	0.48	0.06	0.16	0.01	0.24	0.22	0.23	0.00	0.44	1.23	1.16	0.00	2.38
6.5	0.58	0.59	0.00	1.17	0.24	0.30	0.02	0.56	0.92	0.88	0.00	1.80	1.66	2.08	0.00	3.74
7.5	0.26	0.22	0.00	0.47	0.22	0.18	0.00	0.40	0.38	0.35	0.00	0.74	0.39	0.45	0.00	0.84
8.5	0.28	0.36	0.00	0.64	0.44	0.34	0.00	0.78	0.38	0.28	0.00	0.66	1.13	1.52	0.00	2.65
9.5	0.54	0.43	0.00	0.97	0.29	0.46	0.00	0.75	0.44	0.53	0.00	0.98	1.23	3.14	0.00	4.37
10.5	0.76	0.66	0.00	1.42	0.31	0.42	0.00	0.72	0.57	0.42	0.00	0.99	0.63	1.16	0.00	1.78
11.5	0.95	0.89	0.00	1.83	0.50	0.29	0.00	0.79	0.68	0.60	0.00	1.28	1.10	2.29	0.00	3.39
12.5	1.26	1.10	0.00	2.37	0.62	0.63	0.00	1.25	0.65	0.59	0.00	1.24	1.52	2.64	0.00	4.16
13.5	1.84	1.74	0.00	3.59	0.81	0.79	0.00	1.61	0.79	0.74	0.00	1.53	2.42	3.03	0.00	5.46
14.5	2.46	2.38	0.00	4.85	1.48	1.13	0.00	2.61	1.26	0.91	0.00	2.17	1.77	2.40	0.00	4.17
15.5	2.29	2.10	0.00	4.40	2.22	1.37	0.00	3.59	1.52	1.13	0.00	2.65	2.04	2.84	0.00	4.88
16.5	2.32	2.49	0.00	4.80	2.24	1.41	0.00	3.65	1.63	1.02	0.00	2.65	2.18	2.17	0.00	4.35
17.5	1.89	2.35	0.00	4.24	1.35	1.79	0.00	3.14	1.54	1.46	0.00	2.99	1.98	2.97	0.00	4.95
18.5	1.35	2.30	0.00	3.65	1.31	1.99	0.00	3.30	1.06	1.38	0.00	2.45	1.51	2.30	0.00	3.81
19.5	0.75	1.78	0.00	2.52	0.58	1.78	0.00	2.36	0.64	1.19	0.00	1.83	0.65	2.34	0.00	2.99
20.5	0.36	1.26	0.00	1.62	0.16	1.26	0.00	1.42	0.29	1.25	0.00	1.55	0.33	1.70	0.00	2.03
21.5	0.16	1.20	0.00	1.36	0.06	0.85	0.00	0.91	0.09	0.96	0.00	1.05	0.16	1.40	0.01	1.57
22.5	0.04	0.85	0.00	0.89	0.06	0.66	0.00	0.72	0.01	0.98	0.00	0.99	0.01	1.44	0.00	1.45
23.5	0.04	0.93	0.00	0.96	0.00	0.58	0.00	0.58	0.01	0.61	0.00	0.63	0.00	1.16	0.00	1.16
24.5	0.00	0.56	0.00	0.56	0.01	0.73	0.00	0.74	0.00	0.70	0.00	0.70	0.00	0.70	0.00	0.70
25.5	0.00	0.80	0.00	0.80	0.00	0.58	0.00	0.58	0.00	0.49	0.00	0.49	0.00	0.63	0.00	0.63
26.5	0.00	0.56	0.00	0.56	0.00	0.63	0.00	0.63	0.00	0.45	0.00	0.45	0.00	0.47	0.00	0.47
27.5	0.00	0.44	0.00	0.44	0.00	0.50	0.00	0.50	0.00	0.44	0.00	0.44	0.01	0.29	0.00	0.30
28.5	0.00	0.38	0.00	0.38	0.00	0.37	0.00	0.37	0.00	0.23	0.00	0.23	0.00	0.36	0.00	0.36
29.5	0.00	0.23	0.00	0.23	0.00	0.17	0.00	0.17	0.00	0.10	0.00	0.10	0.00	0.18	0.00	0.18
30.5	0.00	0.11	0.00	0.11	0.00	0.10	0.00	0.10	0.00	0.08	0.00	0.08	0.00	0.18	0.00	0.18
31.5	0.00	0.09	0.00	0.09	0.00	0.03	0.00	0.03	0.00	0.16	0.00	0.16	0.00	0.08	0.00	0.08
32.5	0.00	0.06	0.00	0.06	0.00	0.04	0.00	0.04	0.00	0.02	0.00	0.02	0.00	0.06	0.00	0.06
33.5	0.00	0.06	0.00	0.06	0.00	0.03	0.00	0.03	0.00	0.02	0.00	0.02	0.00	0.03	0.00	0.03
34.5	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
35.5	0.00	0.02	0.00	0.02	0.00	0.05	0.00	0.05	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
36.5	0.00	0.05	0.00	0.05	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01
37.5	0.00	0.04	0.00	0.04	0.00	0.02	0.00	0.02	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	0.03	0.00	0.03	0.00	0.03	0.00	0.03	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	0.00	0.00	0.00	0.00
40.5	0.00	0.01	0.00	0.01	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	0.02	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
Total	18.58	27.44	0.61	46.63	13.01	19.73	1.68	34.43	13.19	18.35	1.29	32.83	22.36	41.53	5.84	69.73
Nº samples:				84				83				82				83
Nº Ind.:	1486	1997	65	3548	1037	1506	140	2683	1077	1413	113	2603	0	1986	427	3731
Sampled catch:				2234				1710				1508				2379
Range:				2.5-42				2.5-39				2.5-38.5				2.5-39
Total catch:				2234				1710				1508				2379
Total valid hauls:				97				89				98				100

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 2009-2013, on board R/V "*Vizconde de Eza*".

Stratum	2009				2010				2011				2012				2013			
	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD
385	0.0225	2	0.275	0.389	0.0225	2	0.000	0.000	0.0229	2	0.205	0.290	0.0225	2	0.000	0.000	0.0229	2	0.114	0.161
387	0.0439	4	568.427	761.003	0.0458	4	278.625	163.544	0.0450	4	471.900	592.192	0.0450	4	456.188	146.956	0.0450	4	903.875	221.080
388	0.0555	5	1686.275	2522.618	0.0570	5	922.261	770.678	0.0563	5	400.680	561.867	0.0570	5	3649.824	2735.118	0.0570	5	2614.156	2779.770
389	0.0803	7	321.423	836.313	0.0795	7	3449.476	9037.325	0.0675	6	314.072	337.845	0.0799	7	5366.450	13039.715	0.0791	7	1522.331	2830.529
390	0.1373	12	0.086	0.182	0.1249	11	0.005	0.011	0.1009	9	0.298	0.893	0.1354	12	0.307	0.723	0.1358	12	0.250	0.567
391	0.0458	4	243.571	371.869	0.0454	4	2337.331	4421.647	0.0458	4	270.078	524.098	0.0458	4	1317.264	848.814	0.0450	4	9.546	9.721
392	0.0229	2	797.546	42.491	0.0225	2	480.100	211.425	0.0229	2	7489.781	7767.171	0.0225	2	4138.815	2411.128	0.0225	2	1336.512	1473.062
729	0.0341	3	50.830	11.765	0.0338	3	284.767	335.507	0.0338	3	1405.563	2154.649	0.0338	3	1491.733	2440.054	0.0341	3	1933.319	1952.744
730	0.0338	3	167.600	193.999	0.0334	3	147.447	167.733	0.0334	3	98.992	73.752	0.0338	3	214.100	203.592	0.0334	3	143.300	121.829
731	0.0341	3	37.000	30.152	0.0338	3	89.033	43.263	0.0334	3	45.227	32.987	0.0341	3	37.000	4.590	0.0334	3	82.897	60.702
732	0.0450	4	8.311	9.503	0.0450	4	16.665	14.441	0.0454	4	12.480	9.605	0.0454	4	7.236	4.921	0.0450	4	5.558	2.888
733	0.0450	4	59.725	53.776	0.0450	4	174.368	45.484	0.0454	4	255.160	236.623	0.0454	4	129.800	140.677	0.0450	4	418.230	374.577
734	0.0218	2	16.220	17.367	0.0225	2	5.945	3.868	0.0225	2	7.888	0.972	0.0233	2	9.015	1.393	0.0221	2	168.600	170.554
741	0.0221	2	0.903	0.012	0.0225	2	0.000	0.000	0.0218	2	0.500	0.707	0.0218	2	0.700	0.990	0.0221	2	2.003	2.833
742	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.208	0.294	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000
743	0.0203	2	5.575	7.884	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000
744	0.0210	2	0.000	0.000	0.0229	2	0.133	0.188	0.0221	2	0.858	1.213	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000
745	0.0559	5	0.000	0.000	0.0563	5	0.436	0.632	0.0446	4	0.745	1.007	0.0570	5	0.348	0.506	0.0559	5	0.490	0.565
746	0.0668	6	0.043	0.106	0.0679	6	0.053	0.131	0.0566	5	0.000	0.000	0.0675	6	0.000	0.000	0.0675	6	0.000	0.000
747	0.1118	10	0.000	0.000	0.1125	10	0.000	0.000	0.0893	8	0.379	1.071	0.1121	10	0.000	0.000	0.1125	10	0.000	0.000
748	0.0229	2	1.576	2.228	0.0225	2	0.000	0.000	0.0221	2	0.595	0.134	0.0225	2	0.000	0.000	0.0225	2	7.045	8.846
749	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000
750	0.0791	7	0.230	0.609	0.0900	8	0.184	0.520	0.0668	6	0.242	0.592	0.0885	8	0.039	0.110	0.0896	8	0.000	0.000
751	0.0338	3	0.000	0.000	0.0225	2	0.000	0.000	0.0334	3	0.000	0.000	0.0218	2	0.000	0.000	0.0446	4	0.000	0.000

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

TABLE 12.- Stratified mean catches (Kg) of **redfish** by stratum and year (2003-2013) and SD. Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	0.12	0.59	-	0.00	4.84	58.35	32.45	0.00	24.19	0.00	13.45
387	439.04	14336.00	-	29103.36	20582.40	47392.00	145517.18	71328.00	120806.40	116784.00	231392.00
388	2303.84	4212.60	-	23576.28	57861.85	75951.75	602000.18	329247.18	143042.76	1302987.17	933253.69
389	407.58	16822.45	-	23418.22	5458.01	196133.55	163604.53	1755783.21	159862.48	2731523.05	774866.41
390	472.70	0.00	-	153.59	141.00	751.23	70.36	3.93	242.69	250.00	203.95
391	24.44	404.67	-	2012.07	1695.53	308262.66	68687.02	659127.27	76161.86	371468.38	2691.97
392	6713.50	177236.40	-	633242.55	139149.25	30326.75	115644.17	69614.50	1086018.17	600128.18	193794.24
729	16516.80	57706.50	-	37603.00	23973.29	115034.80	9454.32	52966.60	261434.78	277462.40	359597.27
730	39283.60	9443.50	-	24806.97	62515.29	5064.30	28492.00	25065.93	16828.70	36397.00	24361.00
731	8502.84	17182.80	-	4115.52	8013.60	28720.80	7992.00	19231.20	9768.96	7992.00	17905.68
732	16678.20	9707.78	-	1302.46	2798.49	2766.23	1919.90	3849.62	2882.88	1671.40	1283.78
733	n.s	26130.00	-	16988.40	27066.00	31028.40	13975.65	40802.00	59707.44	30373.20	97865.82
734	n.s	823.65	-	1886.11	3783.31	3440.21	2481.66	909.59	1206.79	1379.30	25795.80
741	224000.00	25.50	-	0.00	0.00	55.50	90.25	0.00	50.00	70.00	200.30
742	0.00	21.18	-	0.00	19.20	0.00	0.00	0.00	13.31	0.00	0.00
743	n.s	106.59	-	0.00	0.00	0.00	284.33	0.00	0.00	0.00	0.00
744	n.s	0.00	-	0.00	31.58	0.00	0.00	8.78	56.63	0.00	0.00
745	610078.80	0.00	-	41.47	132.24	126.74	0.00	151.73	259.26	121.10	170.59
746	0.00	0.00	-	46.39	0.00	0.00	16.99	20.91	0.00	0.00	0.00
747	n.s	144.80	-	0.00	0.00	8.98	0.00	0.00	274.22	0.00	0.00
748	429.30	69.96	-	20.67	131.97	682.11	250.50	0.00	94.61	0.00	1120.16
749	0.00	0.00	-	0.00	0.00	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	102.17	134.37	21.68	0.00
751	n.s	n.s	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
TOTAL	925850.76	334374.97		798317.04	353357.83	845804.35	1160641.36	3028212.59	1938870.48	5478628.86	2664516.12
	206.94	53.43		123.06	54.47	130.38	178.92	466.81	298.89	844.56	410.75
SD	136.03	28.87		90.99	11.94	36.35	69.07	285.47	130.15	396.90	115.72

TABLE 13.- Survey estimates (by the swept area method) of **redfish** biomass (t.) by stratum and year and their SD 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 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	0	0	-	0	0	5	3	0	2	0	1
387	38	1341	-	2587	1830	4358	13267	6236	10738	10381	20568
388	207	401	-	2082	5143	6797	54234	28881	12715	114297	81864
389	36	1495	-	2062	485	17602	14271	154597	14210	239382	68551
390	42	0	-	14	13	65	6	0	22	22	18
391	2	37	-	179	151	27175	6005	58105	6659	32478	239
392	578	16584	-	55365	12369	2741	10111	6188	94952	53345	17226
729	1573	5216	-	3342	2131	10225	831	4708	23239	24663	31613
730	3551	854	-	2281	5557	471	2533	2253	1513	3235	2190
731	743	1478	-	362	712	2611	703	1709	878	703	1609
732	1483	925	-	117	249	248	171	342	254	147	114
733	n.s	2375	-	1498	2406	2878	1242	3627	5263	2678	8699
734	n.s	81	-	168	336	311	228	81	107	119	2332
741	19911	2	-	0	0	5	8	0	5	6	18
742	0	2	-	0	2	0	0	0	1	0	0
743	n.s	11	-	0	0	0	28	0	0	0	0
744	n.s	0	-	0	3	0	0	1	5	0	0
745	53633	0	-	4	12	11	0	13	23	11	15
746	0	0	-	4	0	0	2	2	0	0	0
747	n.s	14	-	0	0	1	0	0	25	0	0
748	39	7	-	2	12	63	22	0	9	0	100
749	0	0	-	0	0	0	0	0	0	0	0
750	n.s	0	-	0	0	0	11	9	12	2	0
751	n.s	n.s	-	0	0	0	0	0	0	0	0
TOTAL	81837	30825		70066	31410	75567	103675	266754	170632	481469	235158
SD	50717	17163		50718	6885	20435	40871	164597	72507	229026	66637

TABLE 14.- Redfish length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2006				2007				2008				2009			
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
4	0.00	0.01	0.00	0.01	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	0.10	0.05	2.83	2.98	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	0.90	1.28	13.68	15.86	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	2.18	1.28	1.82	5.28	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	3.00	3.27	0.12	6.40	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	11.25	8.43	0.00	19.68	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	20.69	19.49	0.00	40.18	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	14.29	13.66	0.00	27.95	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	23.65	11.01	0.00	34.66	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	41.88	31.01	0.00	72.89	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	40.39	44.21	0.00	84.60	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	9.50	58.30	0.00	67.79	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	8.69	64.05	0.00	72.74	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	6.12	47.61	0.00	53.73	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	4.13	23.73	0.00	27.86	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	0.72	3.74	0.00	4.47	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	0.12	2.15	0.00	2.27	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	0.08	1.05	0.00	1.12	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	0.01	0.00	0.03	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	0.00	0.01	0.00	0.01	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	0.00	0.00	0.00	0.00	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	0.03	0.00	0.03	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	0.01	0.00	0.01	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	0.00	0.00	0.00	0.00	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	0.00	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
54	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
56	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
58	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
60	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	187.71	334.38	18.45	540.54	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:				48				51				52				51
Nº Ind.:	3205	3089	1205	7499	2669	2360	2016	7045	3957	3147	1372	8476	3016	2723	558	6297
Sampled catch:				11080				4675				12283				16615
Range:				5-48				5-53				5-47				5-49
Total catch:				11080				4675				12283				16615
Total valid hauls:				100				94				100				98

TABLE 14 (cont).- Redfish length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2010				2011				2012				2013			
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
4	0.00	0.00	0.05	0.05	0.00	0.00	0.20	0.20	0.00	0.00	0.02	0.02	0.00	0.00	0.09	0.09
6	0.00	0.00	3.06	3.06	0.00	0.00	5.36	5.36	0.00	0.00	11.79	11.79	0.00	0.00	5.15	5.15
8	0.00	0.00	5.23	5.23	0.00	0.00	6.74	6.74	0.06	0.82	16.26	17.13	0.01	0.00	9.49	9.50
10	0.20	0.00	4.23	4.43	0.14	0.08	5.23	5.45	3.18	4.43	12.65	20.26	0.06	0.33	10.90	11.30
12	0.21	0.12	3.91	4.24	1.55	1.30	2.51	5.36	9.66	4.04	4.21	17.91	4.92	2.02	3.30	10.23
14	2.31	8.76	2.81	13.87	2.58	2.02	1.26	5.86	5.06	2.67	0.94	8.68	9.57	4.45	0.04	14.06
16	52.93	20.23	0.33	73.50	13.55	6.58	0.00	20.13	12.20	5.77	0.00	17.97	10.71	8.41	0.00	19.12
18	362.56	228.57	0.00	591.13	54.39	33.52	0.00	87.90	134.16	83.98	0.00	218.14	21.03	10.38	0.00	31.41
20	557.56	698.41	0.00	1255.97	141.06	124.18	0.00	265.25	635.81	404.59	0.00	1040.41	172.77	104.22	0.00	276.99
22	260.01	387.04	0.00	647.05	115.55	123.27	0.00	238.82	783.26	916.84	0.00	1700.11	247.48	310.10	0.00	557.58
24	91.63	122.89	0.00	214.51	165.60	80.38	0.00	245.98	279.36	676.30	0.00	955.66	166.92	323.66	0.00	490.58
26	53.99	95.89	0.00	149.88	110.11	66.27	0.00	176.37	118.77	229.31	0.00	348.08	89.86	137.72	0.00	227.57
28	21.46	66.19	0.00	87.65	33.80	104.64	0.00	138.43	23.11	113.92	0.00	137.02	27.74	80.12	0.00	107.86
30	8.10	14.77	0.00	22.87	5.54	79.03	0.00	84.57	6.96	74.74	0.00	81.70	13.10	58.07	0.00	71.17
32	4.85	10.51	0.00	15.36	2.92	27.91	0.00	30.82	3.54	30.04	0.00	33.58	4.06	22.19	0.00	26.25
34	2.69	4.84	0.00	7.54	1.12	17.35	0.00	18.48	3.37	6.71	0.00	10.08	3.59	10.79	0.00	14.37
36	1.25	2.39	0.00	3.64	1.18	5.13	0.00	6.31	1.21	2.74	0.00	3.96	1.19	4.65	0.00	5.84
38	0.60	1.72	0.00	2.31	0.21	0.67	0.00	0.88	1.21	1.64	0.00	2.85	0.06	2.10	0.00	2.16
40	0.06	0.95	0.00	1.01	0.01	0.05	0.00	0.06	0.06	0.46	0.00	0.53	0.13	0.10	0.00	0.23
42	0.06	1.79	0.00	1.85	0.02	0.00	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.94	0.00	0.94
44	0.00	0.11	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	1.94	0.00	1.94
46	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.05	0.09	0.06	0.00	0.15	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	0.11	0.00	0.11	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	0.02	0.00	0.03
52	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.04	0.03	0.00	0.00	0.03	0.00	0.02	0.00	0.02
54	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00	0.05	0.03	0.00	0.08	0.00	0.00	0.00	0.00
56	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
58	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00
60	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.00	0.00	0.00	0.00
Total	1420.47	1665.26	19.63	3105.35	649.33	672.46	21.31	1343.10	2021.20	2559.23	45.88	4626.30	773.21	1082.22	28.97	1884.40
Nº samples:				48				51				49				52
Nº Ind.:	3216	3082	1178	7476	3017	3572	443	7032	3715	3954	502	8171	3635	4233	866	8734
Sampled catch:				42525				27586				76987				38588
Range:				5-55				5-52				5-61				5-53
Total catch:				42526				27586				76988				38588
Total valid hauls:				97				89				98				100

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 2009-2013, on board R/V "*Vizconde de Eza*".

Stratum	2009				2010				2011				2012				2013			
	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD
385	0.0225	2	22.855	12.155	0.0225	2	4.230	5.204	0.0229	2	40.870	7.722	0.0225	2	38.670	8.358	0.0229	2	18.500	15.570
387	0.0439	4	20.590	15.584	0.0458	4	22.350	21.258	0.0450	4	5.241	5.174	0.0450	4	7.559	6.290	0.0450	4	23.395	7.473
388	0.0555	5	33.480	11.888	0.0570	5	34.932	33.326	0.0563	5	9.356	7.705	0.0570	5	42.734	32.557	0.0570	5	32.704	9.754
389	0.0803	7	12.954	7.076	0.0795	7	27.170	24.762	0.0675	6	11.893	10.892	0.0799	7	14.376	12.301	0.0791	7	21.343	11.010
390	0.1373	12	14.043	24.187	0.1249	11	12.900	8.972	0.1009	9	20.264	12.350	0.1354	12	18.599	15.739	0.1358	12	14.574	21.619
391	0.0458	4	31.899	30.002	0.0454	4	24.041	14.994	0.0458	4	32.718	28.277	0.0458	4	38.843	29.385	0.0450	4	37.358	37.052
392	0.0229	2	41.322	31.215	0.0225	2	36.728	7.462	0.0229	2	40.537	19.861	0.0225	2	178.990	196.916	0.0225	2	56.130	25.725
729	0.0341	3	38.090	23.526	0.0338	3	6.453	5.814	0.0338	3	4.906	5.481	0.0338	3	35.344	8.527	0.0341	3	28.835	4.548
730	0.0338	3	0.000	0.000	0.0334	3	0.012	0.021	0.0334	3	1.467	2.540	0.0338	3	3.670	6.357	0.0334	3	11.360	7.412
731	0.0341	3	22.847	22.201	0.0338	3	11.114	11.389	0.0334	3	4.470	5.812	0.0341	3	3.263	2.986	0.0334	3	14.460	9.648
732	0.0450	4	7.100	11.428	0.0450	4	0.000	0.000	0.0454	4	0.000	0.000	0.0454	4	0.000	0.000	0.0450	4	0.848	1.695
733	0.0450	4	4.315	6.530	0.0450	4	5.573	4.374	0.0454	4	2.899	3.869	0.0454	4	5.995	4.874	0.0450	4	18.918	20.706
734	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0233	2	0.010	0.014	0.0221	2	0.000	0.000
741	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0218	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000
742	0.0214	2	0.000	0.000	0.0225	2	0.011	0.016	0.0225	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000
743	0.0203	2	1.395	1.973	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000
744	0.0210	2	0.000	0.000	0.0229	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000
745	0.0559	5	0.000	0.000	0.0563	5	0.650	1.453	0.0446	4	0.000	0.000	0.0570	5	0.004	0.008	0.0559	5	0.000	0.000
746	0.0668	6	0.000	0.000	0.0679	6	0.000	0.000	0.0566	5	0.000	0.000	0.0675	6	0.000	0.000	0.0675	6	0.000	0.000
747	0.1118	10	0.000	0.000	0.1125	10	0.000	0.000	0.0893	8	0.424	1.199	0.1121	10	0.000	0.000	0.1125	10	0.000	0.000
748	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000
749	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000
750	0.0791	7	0.000	0.000	0.0900	8	0.000	0.000	0.0668	6	0.000	0.000	0.0885	8	0.000	0.000	0.0896	8	0.493	1.393
751	0.0338	3	0.000	0.000	0.0225	2	0.000	0.000	0.0334	3	0.000	0.000	0.0218	2	0.000	0.000	0.0446	4	0.154	0.308

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

Table 16.- Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2006-2013 for **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).

	Thorny skate				**Black dogfish**			
Year	Sex	L-W Equations	N	r^2	Sex	L-W Equations	N	r^2
2006	All	$W = 0.0084\ L^{3.0587}$	491	0.983	All	$W = 0.0011\ L^{3.3758}$	283	0.9216
	Males	$W = 0.0103\ L^{3.0011}$	210	0.9847	Males	$W = 0.0071\ L^{2.9000}$	99	0.9233
	Females	$W = 0.0061\ L^{3.1402}$	281	0.9814	Females	$W = 0.0008\ L^{3.4608}$	184	0.9363
2007	All	$W = 0.0080\ L^{3.0609}$	539	0.9848	All	$W = 0.0008\ L^{3.4421}$	362	0.9155
	Males	$W = 0.0091\ L^{3.0242}$	255	0.9868	Males	$W = 0.0099\ L^{2.8281}$	147	0.9029
	Females	$W = 0.0072\ L^{3.0929}$	284	0.9839	Females	$W = 0.0006\ L^{3.5445}$	215	0.9373
2008	All	$W = 0.0071\ L^{3.0883}$	598	0.9884	All	$W = 0.0014L^{3.3183}$	279	0.9006
	Males	$W = 0.0077\ L^{3.0618}$	282	0.9903	Males	$W = 0.0087\ L^{2.8575}$	160	0.8956
	Females	$W = 0.0064\ L^{3.1175}$	316	0.9867	Females	$W = 0.0008\ L^{3.4541}$	119	0.9283
2009	All	$W = 0.0072\ L^{3.0862}$	283	0.9864	All	$W = 0.0007\ L^{3.4922}$	236	0.9246
	Males	$W = 0.0093\ L^{3.0231}$	171	0.9848	Males	$W = 0.0132\ L^{2.7605}$	75	0.8865
	Females	$W = 0.0057\ L^{3.1507}$	112	0.9881	Females	$W = 0.0007\ L^{3.5184}$	161	0.9465
2010	All	$W = 0.0060\ L^{3.1361}$	290	0.9906	All	$W = 0.0019\ L^{3.2510}$	299	0.9506
	Males	$W = 0.0060\ L^{3.1285}$	149	0.9892	Males	$W = 0.0137\ L^{2.7559}$	130	0.9408
	Females	$W = 0.0056\ L^{3.1630}$	141	0.9927	Females	$W = 0.0012\ L^{3.3617}$	169	0.9637
2011	All	$W = 0.0031\ L^{3.2899}$	218	0.9937	All	$W = 0.0020\ L^{3.2316}$	455	0.9518
	Males	$W = 0.0036\ L^{3.2468}$	136	0.9941	Males	$W = 0.0059\ L^{2.9580}$	171	0.9493
	Females	$W = 0.0024\ L^{3.3657}$	82	0.9941	Females	$W = 0.0014\ L^{3.3220}$	284	0.9568
2012	All	$W = 0.0065\ L^{3.1140}$	352	0.9918	All	$W = 0.0019\ L^{3.2460}$	242	0.9531
	Males	$W = 0.0085\ L^{3.0429}$	219	0.9925	Males	$W = 0.0107\ L^{2.8100}$	116	0.9571
	Females	$W = 0.0040\ L^{3.2467}$	133	0.9933	Females	$W = 0.0010\ L^{3.4151}$	126	0.9718
2013	All	$W = 0.0057\ L^{3.1365}$	336	0.9926	All	$W = 0.0007\ L^{3.4877}$	352	0.9275
	Males	$W = 0.0054\ L^{3.1470}$	218	0.9914	Males	$W = 0.0084\ L^{2.8679}$	81	0.8884
	Females	$W = 0.0054\ L^{3.1631}$	118	0.9955	Females	$W = 0.007\ L^{3.4843}$	271	0.9385

TABLE 17.- Stratified mean catches (Kg) of **thorny skate** by stratum and year (2003-2013) and SD. Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	0.00	831.90	-	713.19	3570.68	4437.69	2696.89	499.14	4822.66	4563.06	2183.00
387	1355.52	2739.20	-	4208.00	8316.16	6726.59	5271.04	5721.60	1341.76	1935.04	5989.12
388	4738.58	5961.90	-	15774.40	11101.27	13261.69	11952.50	12470.58	3340.16	15256.04	11675.33
389	3045.60	5548.10	-	16786.09	13163.25	16830.16	6593.66	13829.31	6053.28	7317.60	10863.51
390	154.85	1627.28	-	4506.21	6003.36	4110.66	11444.98	10513.50	16515.07	15158.46	11878.15
391	485.98	18118.50	-	42606.68	28385.42	53804.19	8995.45	6779.63	9226.41	10953.66	10534.89
392	1457.25	9033.50	-	21677.50	47864.50	23090.82	5991.69	5325.49	5877.79	25953.48	8138.85
729	10221.63	26109.75	-	9162.48	30645.36	6373.35	7084.74	1200.20	912.52	6573.92	5363.25
730	12138.00	0.00	-	739.22	0.00	0.00	0.00	2.04	249.33	623.90	1931.20
731	8360.28	3998.16	-	10099.44	12408.84	1974.24	4934.88	2400.70	965.52	704.74	3123.36
732	17602.20	0.00	-	465.47	0.00	167.94	1640.10	0.00	0.00	0.00	195.77
733	n.s	2191.02	-	3410.14	1503.84	3438.05	1009.71	1304.02	678.31	1402.83	4426.70
734	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	1.53	0.00
741	0.00	0.00	-	0.00	0.00	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	0.70	0.00	0.00	0.00
743	n.s	0.00	-	0.00	0.00	0.00	71.15	0.00	0.00	0.00	0.00
744	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
745	7682.68	0.00	-	0.00	0.00	0.00	0.00	226.20	0.00	1.32	0.00
746	908.46	0.00	-	0.00	0.00	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	0.00	306.80	0.00	0.00
748	10369.98	0.00	-	133.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
749	1015.56	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
750	n.s	764.50	-	218.69	0.00	0.00	0.00	0.00	0.00	0.00	273.83
751	n.s	n.s	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	35.21
TOTAL	79536.57	76923.81	-	130500.54	162962.67	134215.36	67686.78	60273.11	50289.61	90445.57	76612.16
	17.78	12.29	-	20.12	25.12	20.69	10.43	9.29	7.75	13.94	11.81
SD	2.41	4.54	-	3.27	5.19	1.92	1.44	1.30	0.98	3.36	1.36

TABLE 18.- Survey estimates (by the swept area method) of **thorny skate** biomass (t.) by stratum and year and their SD 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 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	0	73	-	62	317	388	240	44	422	406	191
387	119	256	-	374	739	619	481	500	119	172	532
388	426	568	-	1393	987	1187	1077	1094	297	1338	1024
389	268	493	-	1478	1170	1510	575	1218	538	641	961
390	14	142	-	397	534	354	1001	926	1473	1344	1050
391	43	1666	-	3787	2523	4743	786	598	807	958	936
392	125	845	-	1895	4255	2087	524	473	514	2307	723
729	973	2360	-	814	2724	567	623	107	81	584	471
730	1097	0	-	68	0	0	0	0	22	55	174
731	731	344	-	888	1103	179	434	213	87	62	281
732	1565	0	-	42	0	15	146	0	0	0	17
733	n.s	199	-	301	134	319	90	116	60	124	393
734	n.s	0	-	0	0	0	0	0	0	0	0
741	0	0	-	0	0	0	0	0	0	0	0
742	0	0	-	0	0	0	0	0	0	0	0
743	n.s	0	-	0	0	0	7	0	0	0	0
744	n.s	0	-	0	0	0	0	0	0	0	0
745	675	0	-	0	0	0	0	20	0	0	0
746	81	0	-	0	0	0	0	0	0	0	0
747	n.s	0	-	0	0	0	0	0	28	0	0
748	954	0	-	12	0	0	0	0	0	0	0
749	92	0	-	0	0	0	0	0	0	0	0
750	n.s	85	-	20	0	0	0	0	0	0	24
751	n.s	n.s	-	0	0	0	0	0	0	0	3
TOTAL	7164	7031	-	11531	14486	11968	5982	5310	4448	7991	6783
SD	942	2642	-	1887	2993	1124	808	740	560	2008	779

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: 2006-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2006				2007				2008				2009			
Length (cm.)	M	F	I	T	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	0.00	0.00	0.00	0.00
12	0.04	0.01	0.00	0.05	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	0.09	0.00	0.00	0.09	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	0.04	0.03	0.00	0.07	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	0.03	0.02	0.00	0.06	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	0.03	0.03	0.00	0.06	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	0.00	0.03	0.00	0.03	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	0.03	0.01	0.00	0.05	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	0.00	0.01	0.00	0.01	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	0.02	0.01	0.00	0.03	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	0.00	0.03	0.00	0.03	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	0.03	0.01	0.00	0.05	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	0.01	0.03	0.00	0.05	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	0.02	0.01	0.00	0.03	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	0.00	0.04	0.00	0.04	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	0.05	0.03	0.00	0.08	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	0.00	0.03	0.00	0.03	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	0.01	0.03	0.00	0.05	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	0.09	0.08	0.00	0.17	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	0.10	0.08	0.00	0.18	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	0.13	0.17	0.00	0.30	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	0.22	0.13	0.00	0.35	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	0.27	0.37	0.00	0.64	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	0.22	0.24	0.00	0.45	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	0.22	0.46	0.00	0.67	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	0.36	0.39	0.00	0.75	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	0.22	0.53	0.00	0.76	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	0.41	0.54	0.00	0.95	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	0.39	0.00	0.72	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	0.17	0.41	0.00	0.58	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	0.19	0.22	0.00	0.41	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	0.08	0.13	0.00	0.21	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	0.09	0.07	0.00	0.16	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	0.08	0.05	0.00	0.13	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	0.00	0.01	0.00	0.01	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	0.01	0.00	0.02	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	0.00	0.00	0.00	0.00	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	0.00	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	0.00	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	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Total	3.61	4.66	0.00	8.27	5.10	6.71	0.00	11.81	5.10	6.71	0.00	11.81	2.41	1.76	0.00	4.17
Nº samples:				42				43				43				44
Nº Ind.:	312	420	0	732	457	621	0	1078	457	621	0	1078	211	156	0	367
Sampled catch:				1832				2325				2325				996.2
Range:				13-81				12-82				12-82				12-82
Total catch:				1832				2325				2325				996.2
Total valid hauls:				100				94				94				98

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: 2006-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2010				2011				2012				2013			
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
10	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
12	0.05	0.05	0.00	0.10	0.09	0.03	0.00	0.11	0.09	0.05	0.00	0.14	0.01	0.06	0.00	0.07
14	0.08	0.07	0.00	0.15	0.06	0.08	0.00	0.14	0.07	0.05	0.00	0.11	0.10	0.03	0.00	0.13
16	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.03	0.06	0.00	0.10
18	0.01	0.02	0.00	0.03	0.00	0.01	0.00	0.01	0.03	0.00	0.00	0.03	0.02	0.01	0.00	0.03
20	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.04	0.01	0.00	0.05	0.00	0.03	0.00	0.03
22	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.03	0.03	0.00	0.06	0.00	0.00	0.00	0.00
24	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.05	0.06	0.00	0.11	0.00	0.00	0.00	0.00
26	0.01	0.02	0.00	0.03	0.00	0.00	0.00	0.00	0.04	0.03	0.00	0.07	0.00	0.01	0.00	0.01
28	0.00	0.01	0.00	0.01	0.00	0.03	0.00	0.03	0.03	0.11	0.00	0.14	0.02	0.00	0.00	0.02
30	0.04	0.02	0.00	0.07	0.02	0.01	0.00	0.03	0.08	0.01	0.00	0.09	0.00	0.00	0.00	0.00
32	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.01	0.04	0.04	0.00	0.08	0.00	0.00	0.00	0.00
34	0.01	0.04	0.00	0.05	0.00	0.01	0.00	0.01	0.04	0.04	0.00	0.08	0.01	0.02	0.00	0.03
36	0.04	0.02	0.00	0.07	0.02	0.01	0.00	0.03	0.06	0.06	0.00	0.12	0.00	0.03	0.00	0.03
38	0.02	0.01	0.00	0.03	0.00	0.02	0.00	0.02	0.06	0.04	0.00	0.10	0.00	0.02	0.00	0.02
40	0.00	0.01	0.00	0.01	0.01	0.01	0.00	0.03	0.07	0.05	0.00	0.12	0.02	0.04	0.00	0.06
42	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.06	0.01	0.00	0.07	0.02	0.04	0.00	0.06
44	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.02	0.00	0.05	0.06	0.03	0.00	0.10
46	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.05	0.06	0.05	0.00	0.11
48	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.05	0.01	0.00	0.06
50	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.02	0.05	0.00	0.07	0.05	0.00	0.00	0.05
52	0.01	0.02	0.00	0.03	0.00	0.00	0.00	0.00	0.05	0.03	0.00	0.08	0.06	0.00	0.00	0.06
54	0.00	0.02	0.00	0.02	0.00	0.01	0.00	0.01	0.02	0.01	0.00	0.03	0.02	0.03	0.00	0.06
56	0.02	0.04	0.00	0.07	0.00	0.01	0.00	0.01	0.01	0.00	0.00	0.01	0.02	0.03	0.00	0.05
58	0.08	0.09	0.00	0.17	0.02	0.05	0.00	0.07	0.03	0.04	0.00	0.07	0.04	0.02	0.00	0.06
60	0.03	0.12	0.00	0.16	0.06	0.09	0.00	0.15	0.03	0.05	0.00	0.08	0.04	0.03	0.00	0.07
62	0.08	0.10	0.00	0.18	0.03	0.08	0.00	0.10	0.07	0.10	0.00	0.18	0.10	0.09	0.00	0.18
64	0.12	0.16	0.00	0.28	0.15	0.06	0.00	0.20	0.10	0.11	0.00	0.21	0.07	0.14	0.00	0.21
66	0.21	0.18	0.00	0.38	0.13	0.09	0.00	0.23	0.10	0.14	0.00	0.24	0.11	0.14	0.00	0.25
68	0.19	0.23	0.00	0.42	0.19	0.12	0.00	0.31	0.28	0.22	0.00	0.50	0.25	0.17	0.00	0.42
70	0.21	0.07	0.00	0.28	0.17	0.15	0.00	0.32	0.30	0.09	0.00	0.38	0.23	0.17	0.00	0.39
72	0.13	0.08	0.00	0.21	0.18	0.03	0.00	0.22	0.37	0.12	0.00	0.49	0.23	0.06	0.00	0.30
74	0.11	0.05	0.00	0.16	0.16	0.05	0.00	0.21	0.23	0.03	0.00	0.26	0.24	0.02	0.00	0.26
76	0.09	0.03	0.00	0.12	0.11	0.00	0.00	0.11	0.19	0.07	0.00	0.26	0.24	0.06	0.00	0.30
78	0.09	0.01	0.00	0.10	0.05	0.00	0.00	0.05	0.21	0.03	0.00	0.24	0.17	0.01	0.00	0.18
80	0.03	0.00	0.00	0.03	0.04	0.00	0.00	0.04	0.14	0.01	0.00	0.15	0.14	0.00	0.00	0.14
82	0.02	0.00	0.00	0.02	0.01	0.00	0.00	0.01	0.09	0.01	0.00	0.10	0.07	0.00	0.00	0.07
84	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.07	0.00	0.00	0.07	0.02	0.00	0.00	0.02
86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02	0.01	0.00	0.00	0.01
88	0.01	0.00	0.00	0.01	0.04	0.00	0.00	0.04	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00
Total	1.73	1.62	0.00	3.35	1.59	0.96	0.00	2.55	3.19	1.74	0.00	4.93	2.53	1.44	0.00	3.97
Nº samples:				46				39				44				49
Nº Ind.:	159	145	0	304	136	82	0	218	266	151	0	417	225	117	0	342
Sampled catch:				853				663				1309				1128
Range:				12-88				11-88				12-88				13-86
Total catch:				853				663				1309				1128
Total valid hauls:				97				89				98				100

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 2009-2013, on board R/V "*Vizconde de Eza*".

Stratum	2009				2010				2011				2012				2013			
	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD	Swept area	Tow No.	Mean catch	SD
385	0.0225	2	0.000	0.000	0.0225	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	0.0439	4	0.000	0.000	0.0458	4	0.000	0.000	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000
388	0.0555	5	0.000	0.000	0.0570	5	0.000	0.000	0.0563	5	0.000	0.000	0.0570	5	0.000	0.000	0.0570	5	0.000	0.000
389	0.0803	7	0.000	0.000	0.0795	7	0.000	0.000	0.0675	6	0.000	0.000	0.0799	7	0.000	0.000	0.0791	7	0.000	0.000
390	0.1373	12	0.000	0.000	0.1249	11	0.000	0.000	0.1009	9	0.000	0.000	0.1354	12	0.000	0.000	0.1358	12	0.000	0.000
391	0.0458	4	0.000	0.000	0.0454	4	0.000	0.000	0.0458	4	0.000	0.000	0.0458	4	0.000	0.000	0.0450	4	0.000	0.000
392	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000
729	0.0341	3	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	0.0341	3	0.000	0.000
730	0.0338	3	30.959	51.654	0.0334	3	19.640	25.019	0.0334	3	3.646	6.315	0.0338	3	10.040	17.053	0.0334	3	0.000	0.000
731	0.0341	3	0.000	0.000	0.0338	3	0.000	0.000	0.0334	3	0.000	0.000	0.0341	3	0.000	0.000	0.0334	3	0.000	0.000
732	0.0450	4	0.000	0.000	0.0450	4	0.300	0.600	0.0454	4	0.000	0.000	0.0454	4	0.000	0.000	0.0450	4	0.000	0.000
733	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000	0.0454	4	0.000	0.000	0.0454	4	0.000	0.000	0.0450	4	0.000	0.000
734	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0233	2	0.000	0.000	0.0221	2	0.000	0.000
741	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0218	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000
742	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000
743	0.0203	2	1.835	1.082	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.945	1.336
744	0.0210	2	0.430	0.608	0.0229	2	0.000	0.000	0.0221	2	0.612	0.865	0.0221	2	0.000	0.000	0.0221	2	3.550	5.020
745	0.0559	5	0.000	0.000	0.0563	5	0.000	0.000	0.0446	4	0.705	1.410	0.0570	5	0.000	0.000	0.0559	5	0.620	1.386
746	0.0668	6	3.939	5.074	0.0679	6	4.817	2.936	0.0566	5	7.160	9.335	0.0675	6	6.004	4.804	0.0675	6	26.233	40.751
747	0.1118	10	6.653	4.933	0.1125	10	5.965	5.925	0.0893	8	5.204	3.122	0.1121	10	4.889	4.861	0.1125	10	11.874	6.025
748	0.0229	2	12.240	17.310	0.0225	2	83.545	40.807	0.0221	2	135.930	187.058	0.0225	2	25.190	35.624	0.0225	2	25.780	36.458
749	0.0225	2	131.090	156.143	0.0229	2	148.715	196.837	0.0221	2	114.000	69.141	0.0221	2	70.633	84.905	0.0225	2	42.515	34.104
750	0.0791	7	9.146	7.225	0.0900	8	0.848	1.376	0.0668	6	1.711	2.351	0.0885	8	4.283	6.729	0.0896	8	7.622	10.816
751	0.0338	3	5.343	4.636	0.0225	2	1.870	1.414	0.0334	3	3.076	2.976	0.0218	2	9.550	5.388	0.0446	4	7.797	3.881

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

TABLE 21.- Stratified mean catches (Kg) of **black dogfish** by stratum and year (2003-2013) and SD. Research Vessel *Vizconde de Eza*. n.s. means stratum not surveyed. In 2003: the data correspond to 69% of the total area prospected in 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	0.00	0.00	-	0.00	0.00	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	0.00	0.00	0.00	0.00
388	0.00	0.00	-	0.00	0.00	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	0.00	0.00	0.00	0.00
390	0.00	0.00	-	0.00	0.00	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	0.00	0.00	0.00	0.00
392	0.00	0.00	-	0.00	0.00	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	0.00	0.00	0.00	0.00
730	0.00	369.75	-	627.30	3312.88	4652.33	5262.97	3338.80	619.82	1706.80	0.00
731	0.00	0.00	-	0.00	0.00	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	69.30	0.00	0.00	0.00
733	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
734	n.s	0.00	-	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
741	0.00	0.00	-	0.00	0.00	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	0.00	0.00	0.00	0.00
743	n.s	31.90	-	0.00	0.00	0.00	93.59	0.00	0.00	0.00	48.20
744	n.s	0.00	-	47.85	109.73	58.08	28.38	0.00	40.39	0.00	234.30
745	2.32	0.00	-	0.00	0.00	0.00	0.00	0.00	245.34	0.00	215.76
746	0.00	0.00	-	3541.07	3594.84	2407.60	1544.22	1888.13	2806.72	2353.63	10283.47
747	n.s	2944.27	-	2646.94	4354.53	4267.26	4816.77	4318.66	3767.42	3539.64	8596.56
748	0.00	5879.82	-	2498.42	5694.85	12847.20	1946.16	13283.66	21612.87	4005.21	4099.02
749	27688.50	2179.80	-	11481.75	28942.20	4461.66	16517.34	18738.09	14364.00	8899.76	5356.89
750	n.s	1556.80	-	3454.61	7772.42	6875.64	5085.02	471.21	951.50	2381.07	4237.97
751	n.s	n.s	-	252.47	1008.75	865.62	1223.62	428.23	704.48	2186.95	1785.40
TOTAL	27690.82	12962.34	-	24550.42	54790.18	36435.38	36518.07	42536.08	45112.55	25073.06	34857.56
	6.19	2.07	-	3.78	8.45	5.62	5.63	6.56	6.95	3.87	5.37
SD	6.19	1.01	-	1.78	1.28	2.23	2.33	2.83	3.39	1.38	1.34

TABLE 22.- Survey estimates (by the swept area method) of **black dogfish** biomass (t.) by stratum and year and their SD 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 2006-2013.

	Survey										
Stratum	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013
385	0	0	-	0	0	0	0	0	0	0	0
387	0	0	-	0	0	0	0	0	0	0	0
388	0	0	-	0	0	0	0	0	0	0	0
389	0	0	-	0	0	0	0	0	0	0	0
390	0	0	-	0	0	0	0	0	0	0	0
391	0	0	-	0	0	0	0	0	0	0	0
392	0	0	-	0	0	0	0	0	0	0	0
729	0	0	-	0	0	0	0	0	0	0	0
730	0	33	-	58	294	433	468	300	56	152	0
731	0	0	-	0	0	0	0	0	0	0	0
732	0	0	-	0	0	0	0	6	0	0	0
733	n.s	0	-	0	0	0	0	0	0	0	0
734	n.s	0	-	0	0	0	0	0	0	0	0
741	0	0	-	0	0	0	0	0	0	0	0
742	0	0	-	0	0	0	0	0	0	0	0
743	n.s	3	-	0	0	0	9	0	0	0	4
744	n.s	0	-	4	10	5	3	0	4	0	21
745	0	0	-	0	0	0	0	0	22	0	19
746	0	0	-	315	325	227	139	167	248	209	914
747	n.s	287	-	237	387	399	431	384	338	316	764
748	0	592	-	230	506	1181	170	1181	1954	356	364
749	2503	197	-	1004	2573	417	1468	1638	1298	804	476
750	n.s	173	-	309	687	652	450	42	86	215	378
751	n.s	n.s	-	22	90	84	109	38	63	201	160
TOTAL	2503	1286	-	2179	4872	3399	3247	3756	4068	2253	3102
SD	2546	695	-	994	721	1296	1340	1634	1964	819	773

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: 2006-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2006				2007				2008				2009			
Length (cm.)	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
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
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
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
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
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
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
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
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
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
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
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
40	0.00	0.01	0.00	0.01	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	0.01	0.01	0.00	0.02	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	0.03	0.00	0.05	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	0.02	0.02	0.00	0.04	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	0.05	0.02	0.00	0.06	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	0.00	0.03	0.00	0.03	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	0.03	0.06	0.00	0.10	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	0.04	0.06	0.00	0.09	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	0.04	0.06	0.00	0.11	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	0.08	0.12	0.00	0.20	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	0.15	0.15	0.00	0.29	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	0.11	0.23	0.00	0.35	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	0.17	0.19	0.00	0.35	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	0.14	0.18	0.00	0.32	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	0.07	0.14	0.00	0.21	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	0.01	0.15	0.00	0.16	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	0.01	0.15	0.00	0.16	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	0.11	0.00	0.11	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	0.03	0.00	0.03	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	0.02	0.00	0.02	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	0.02	0.00	0.02	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	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00
84	0.00	0.01	0.00	0.01	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	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	0.00	0.01	0.00	0.01
Total	0.94	1.77	0.00	2.71	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				28				30				32
Nº Ind.:	99	184	0	283	179	245	0	424	269	152	0	421	157	234	0	391
Sampled catch:				397				593				526				554
Range:				41-84				41-81				41-85				41-89
Total catch:				397				593				526				554
Total valid hauls:				100				94				100				98

TABLE 23 (cont).- Black dogfish length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2003-2013 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2010				2011				2012				2013			
Length (cm.)	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
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
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
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
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
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
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
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
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
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
36	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
38	0.00	0.01	0.00	0.01	0.00	0.03	0.00	0.03	0.01	0.00	0.00	0.01	0.00	0.01	0.00	0.01
40	0.00	0.00	0.00	0.00	0.01	0.05	0.00	0.06	0.00	0.05	0.00	0.05	0.00	0.01	0.00	0.01
42	0.06	0.04	0.00	0.09	0.09	0.05	0.00	0.14	0.01	0.07	0.00	0.08	0.00	0.04	0.00	0.04
44	0.05	0.09	0.00	0.13	0.08	0.13	0.00	0.20	0.06	0.07	0.00	0.13	0.00	0.06	0.00	0.06
46	0.08	0.11	0.00	0.19	0.10	0.10	0.00	0.20	0.07	0.06	0.00	0.13	0.04	0.03	0.00	0.07
48	0.05	0.07	0.00	0.12	0.18	0.15	0.00	0.33	0.01	0.03	0.00	0.04	0.01	0.04	0.00	0.05
50	0.06	0.06	0.00	0.12	0.14	0.11	0.00	0.25	0.09	0.04	0.00	0.12	0.02	0.06	0.00	0.08
52	0.12	0.09	0.00	0.21	0.12	0.08	0.00	0.20	0.07	0.08	0.00	0.16	0.01	0.06	0.00	0.07
54	0.09	0.10	0.00	0.19	0.07	0.10	0.00	0.17	0.06	0.04	0.00	0.10	0.05	0.10	0.00	0.15
56	0.13	0.14	0.00	0.27	0.23	0.23	0.00	0.47	0.13	0.08	0.00	0.21	0.04	0.12	0.00	0.16
58	0.24	0.11	0.00	0.36	0.38	0.25	0.00	0.64	0.12	0.10	0.00	0.22	0.12	0.11	0.00	0.22
60	0.29	0.21	0.00	0.51	0.41	0.41	0.00	0.82	0.20	0.14	0.00	0.33	0.26	0.21	0.00	0.47
62	0.30	0.20	0.00	0.50	0.37	0.52	0.00	0.89	0.30	0.18	0.00	0.49	0.13	0.25	0.00	0.38
64	0.17	0.14	0.00	0.31	0.22	0.36	0.00	0.58	0.27	0.07	0.00	0.34	0.15	0.37	0.00	0.52
66	0.12	0.17	0.00	0.30	0.14	0.30	0.00	0.44	0.08	0.18	0.00	0.26	0.08	0.35	0.00	0.42
68	0.03	0.16	0.00	0.19	0.03	0.20	0.00	0.23	0.04	0.12	0.00	0.16	0.00	0.36	0.00	0.36
70	0.03	0.19	0.00	0.22	0.01	0.12	0.00	0.13	0.02	0.09	0.00	0.11	0.00	0.21	0.00	0.21
72	0.00	0.31	0.00	0.31	0.01	0.13	0.00	0.14	0.00	0.12	0.00	0.12	0.00	0.16	0.00	0.16
74	0.00	0.28	0.00	0.28	0.00	0.08	0.00	0.08	0.00	0.04	0.00	0.04	0.00	0.13	0.00	0.13
76	0.00	0.11	0.00	0.11	0.00	0.03	0.00	0.03	0.00	0.01	0.00	0.01	0.00	0.05	0.00	0.05
78	0.00	0.10	0.00	0.10	0.00	0.02	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.03	0.00	0.03
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	0.00	0.02	0.00	0.02
82	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
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
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
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	0.00	0.00	0.00	0.00
Total	1.84	2.73	0.00	4.57	2.58	3.47	0.00	6.05	1.55	1.62	0.00	3.16	0.91	2.77	0.00	3.68
Nº samples:				26				22				24				31
Nº Ind.:	172	275	0	447	214	301	0	515	150	137	0	287	85	264	0	349
Sampled catch:				624				612				360				517
Range:				37-87				36-78				39-80				39-81
Total catch:				624				612				360				517
Total valid hauls:				97				89				98				100

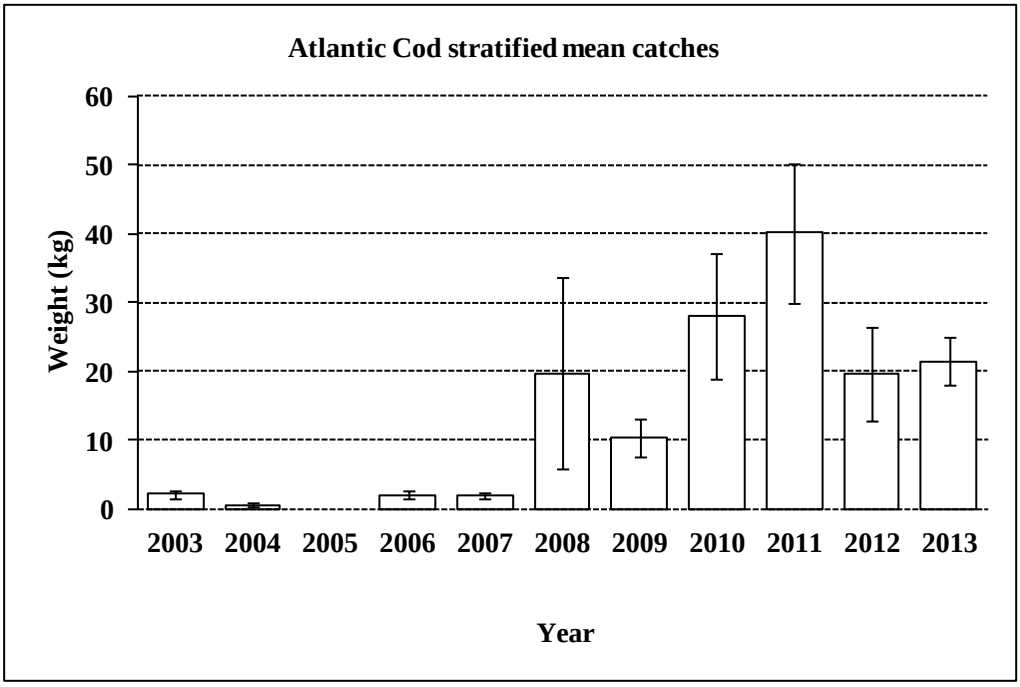

FIGURE 1.- Atlantic cod stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

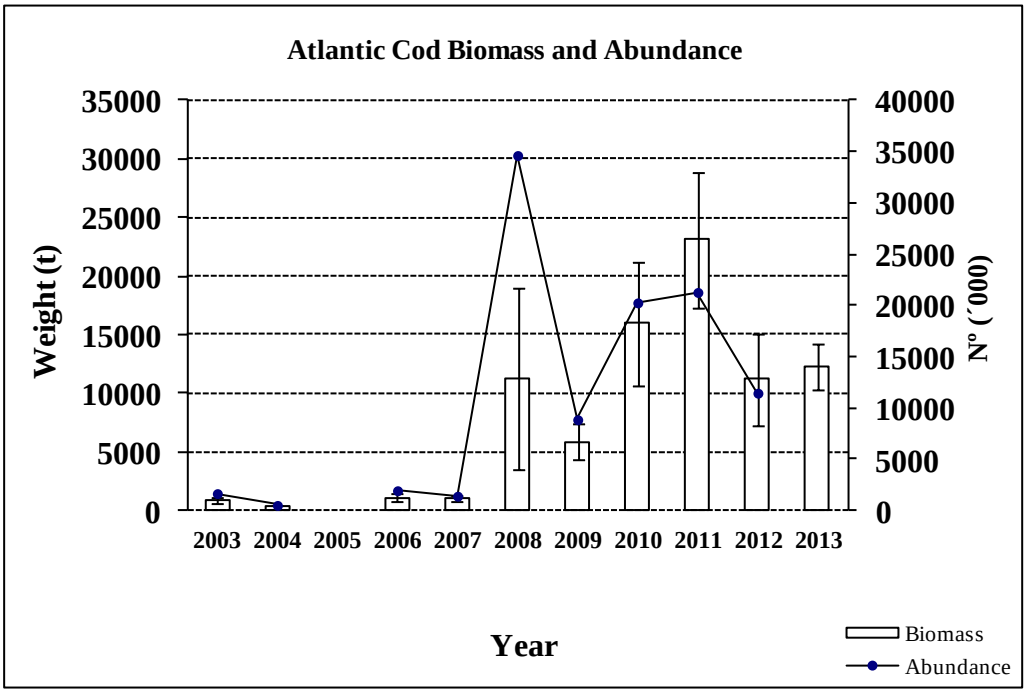

FIGURE 2.- Atlantic cod abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

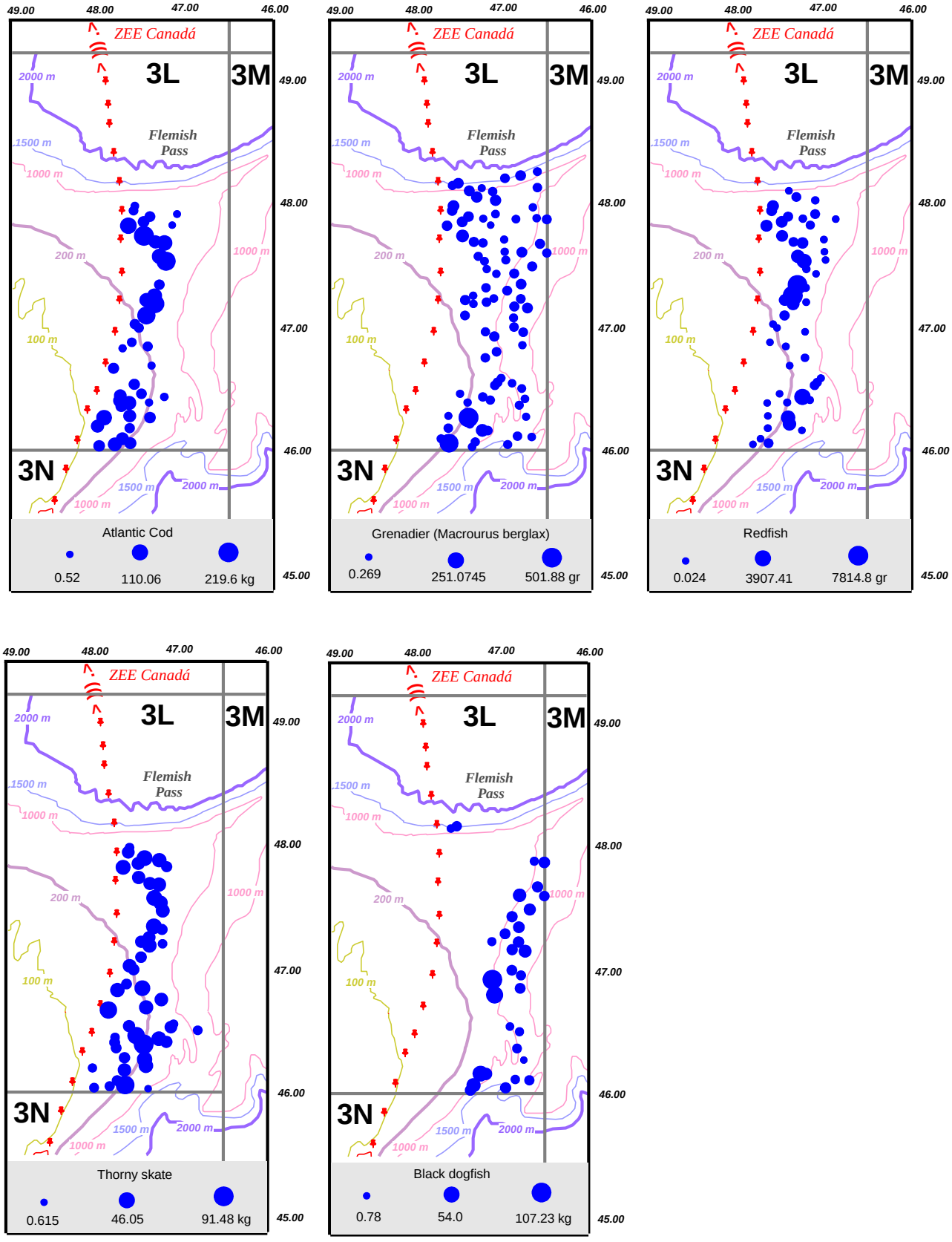

FIGURE 3.- Distribution of the catches per haul for **Atlantic cod, Roughhead grenadier, redfish, thorny skate and black dogfish** in 2013 Spanish 3L survey.

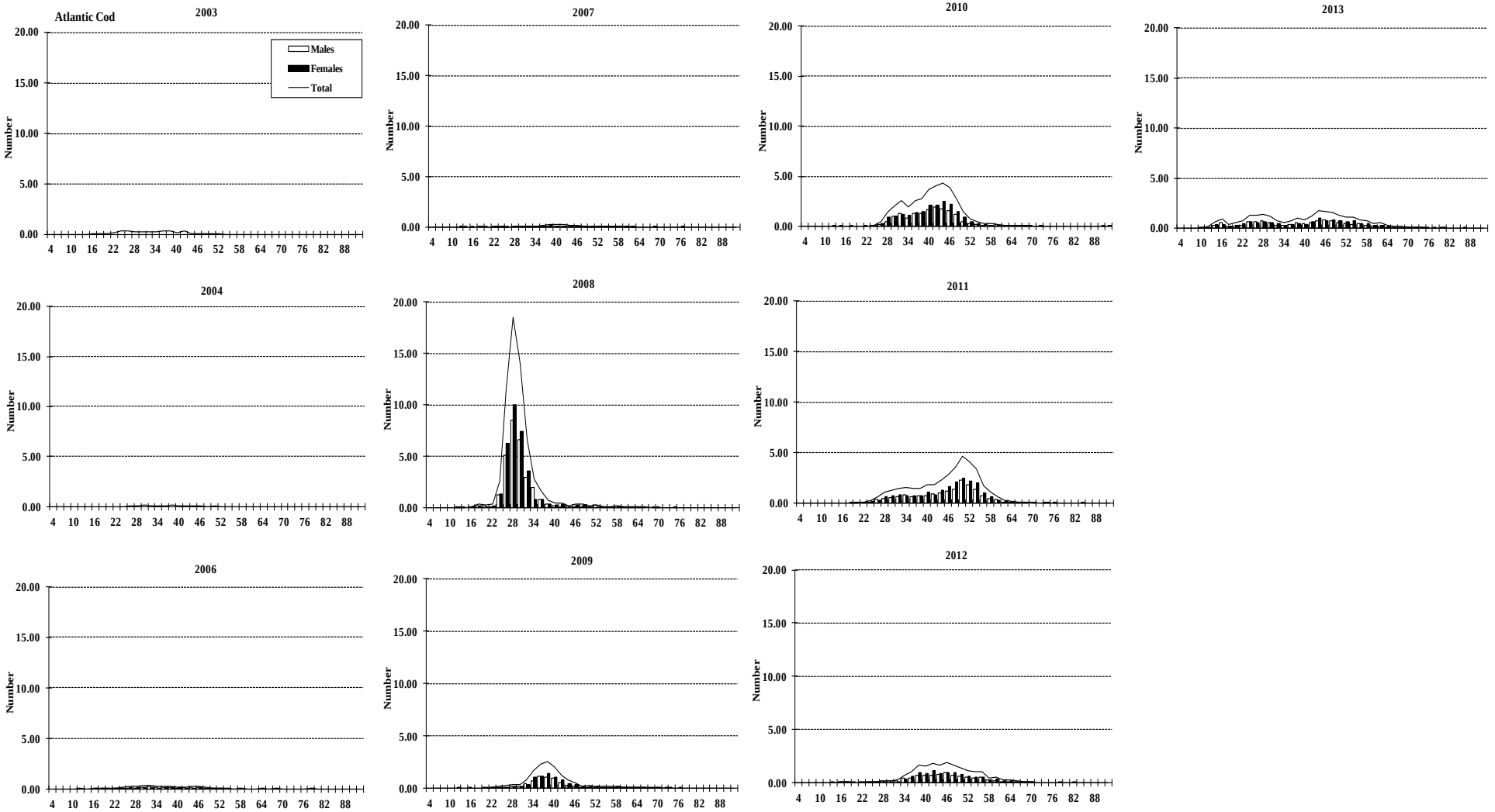

FIGURE 4.- Atlantic cod length distribution (cm) in NAFO 3L: 2003-2013. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

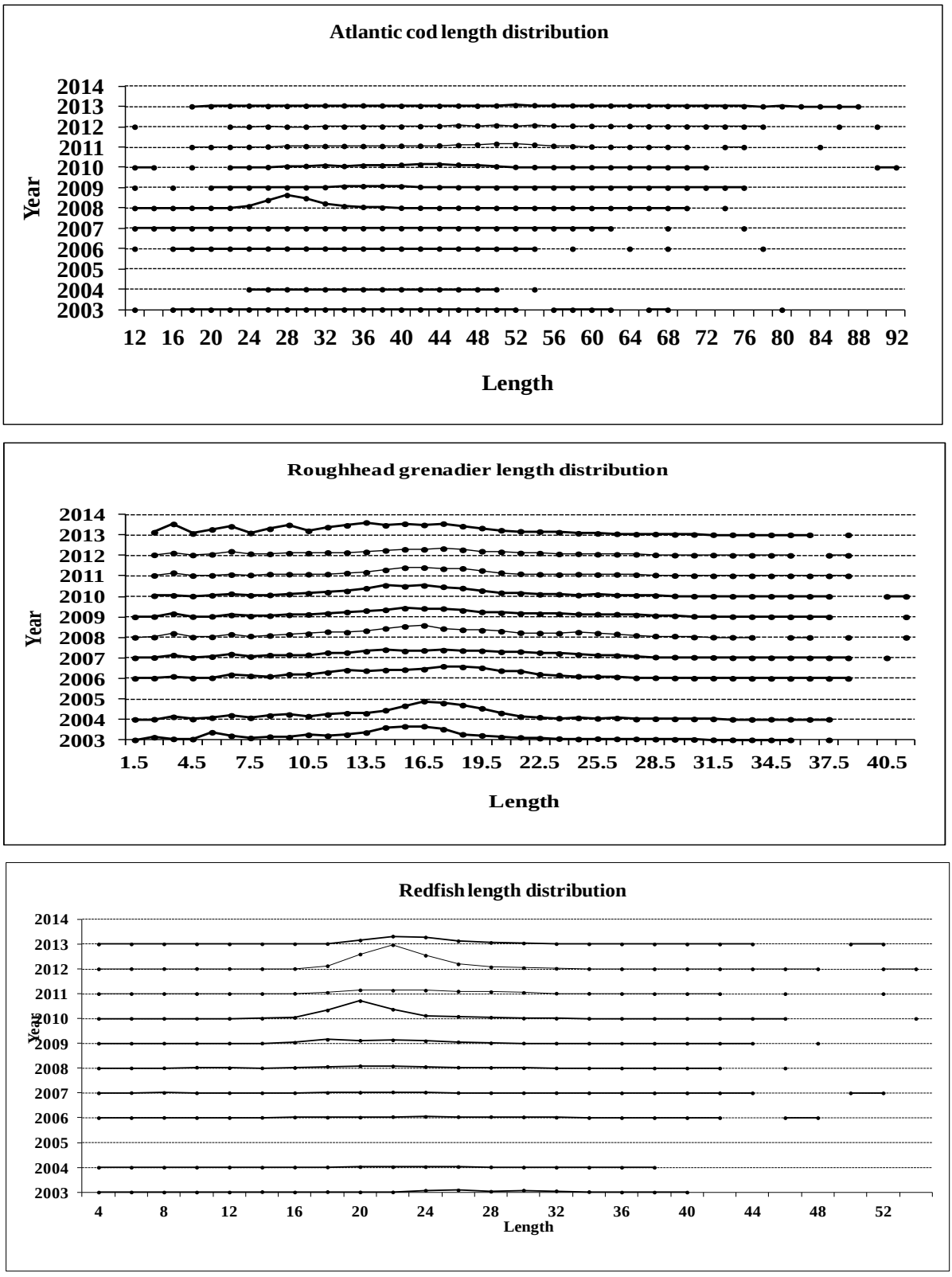

FIGURE 5.- Atlantic cod, roughhead grenadier and redfish length distribution (cm) in NAFO 3L: 2003-2013.

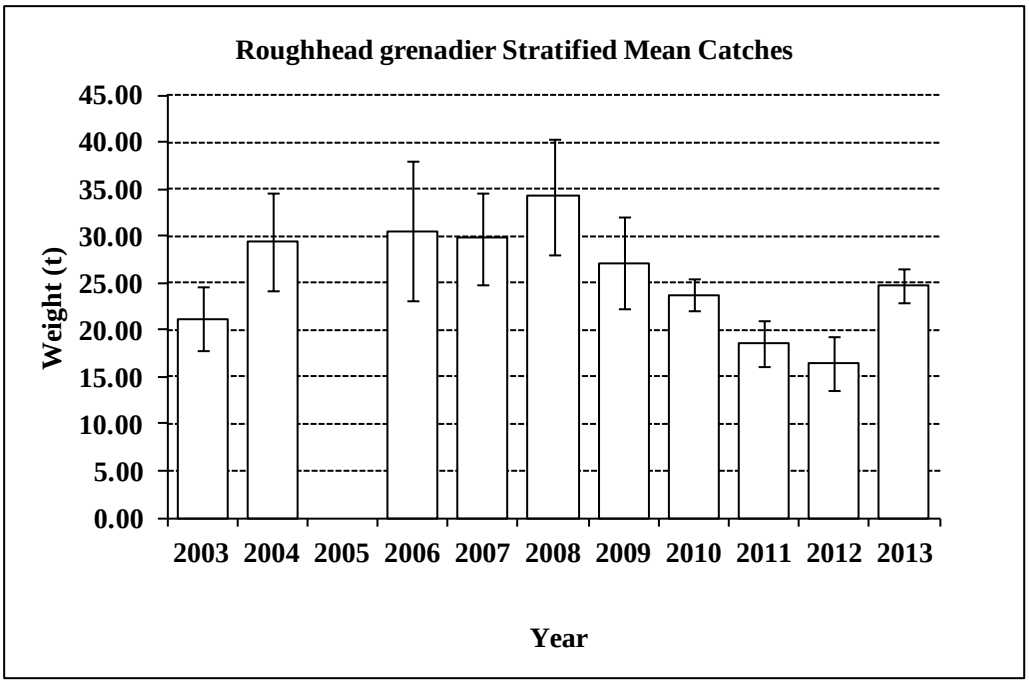

FIGURE 6.- Roughhead grenadier stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

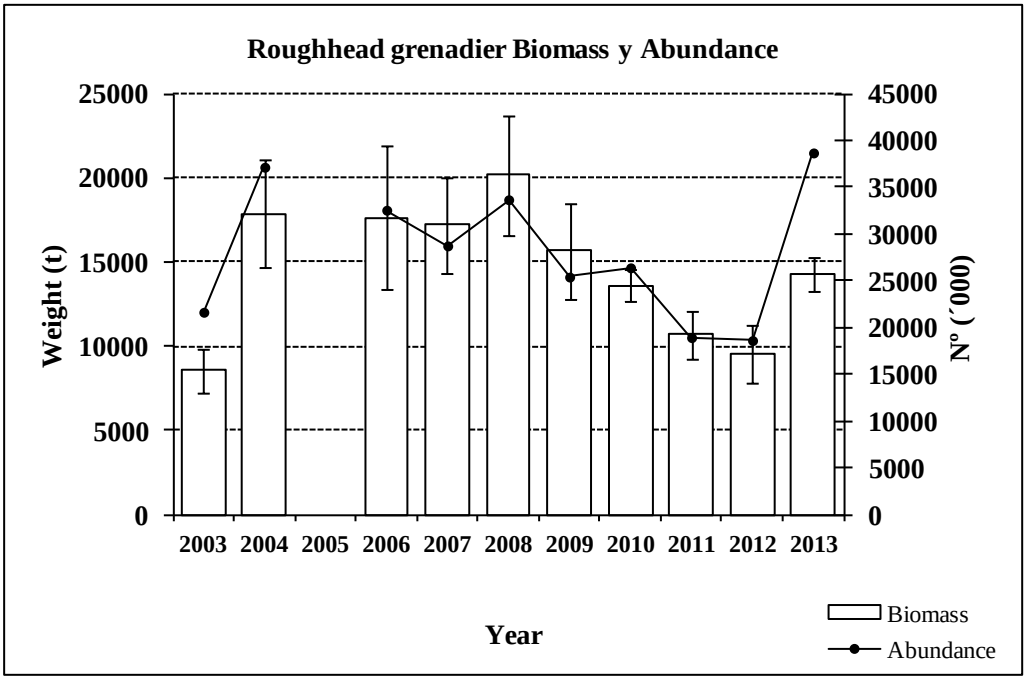

FIGURE 7.- Roughhead grenadier abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

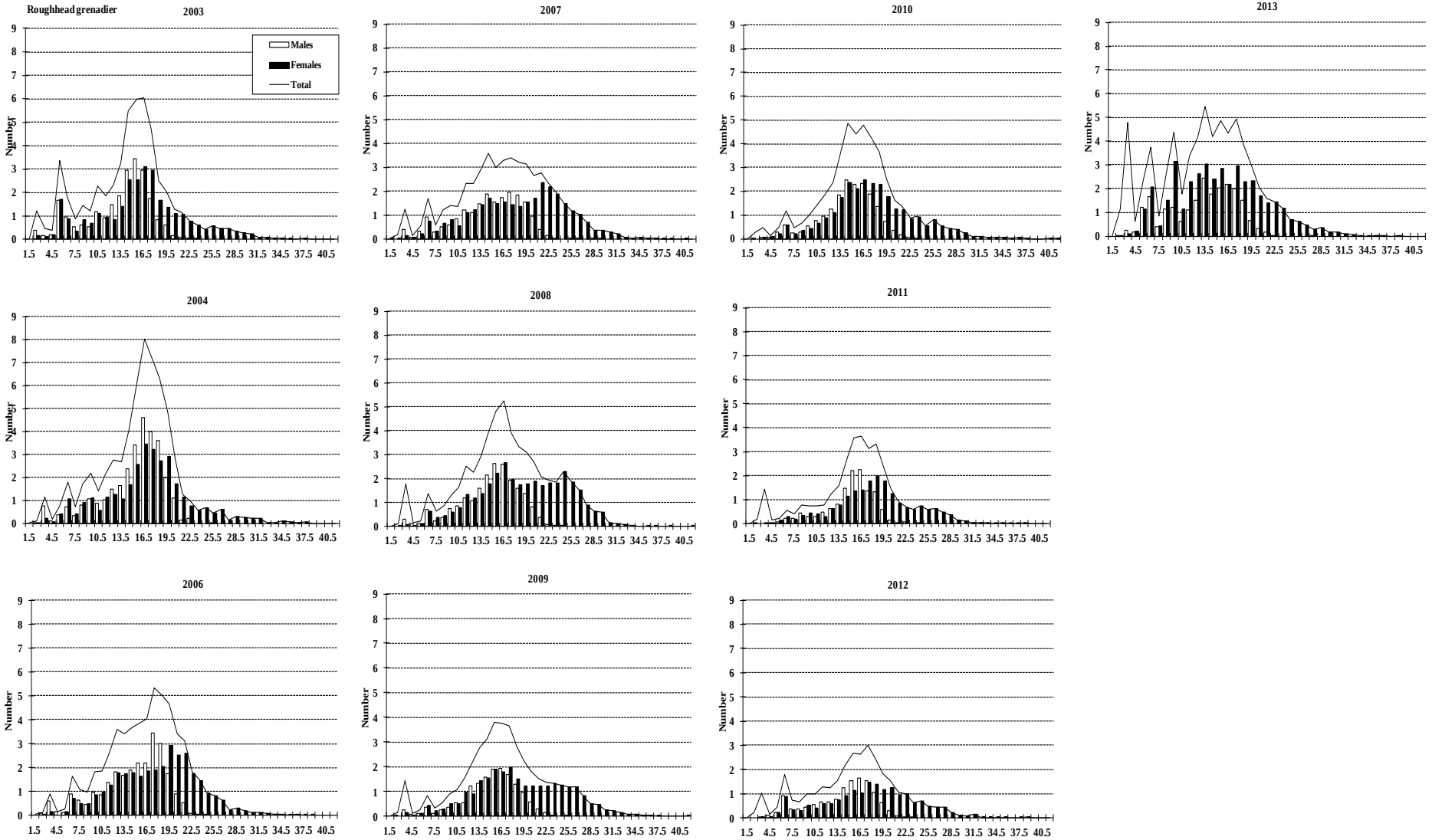

FIGURE 8.- Roughhead grenadier length distribution (cm) in NAFO 3L: 2003-2013. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

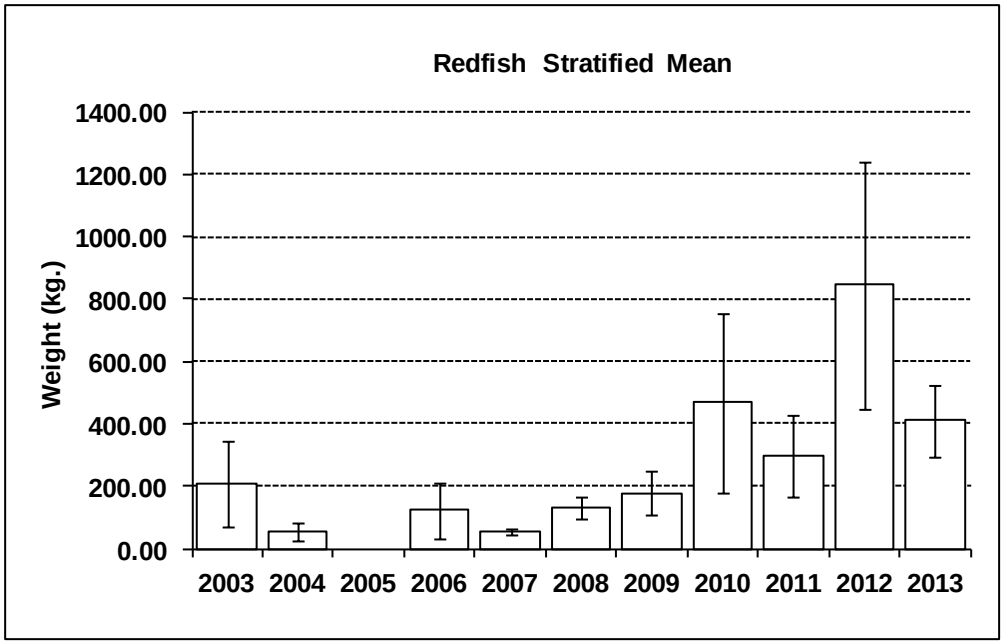

FIGURE 9.- Redfish stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

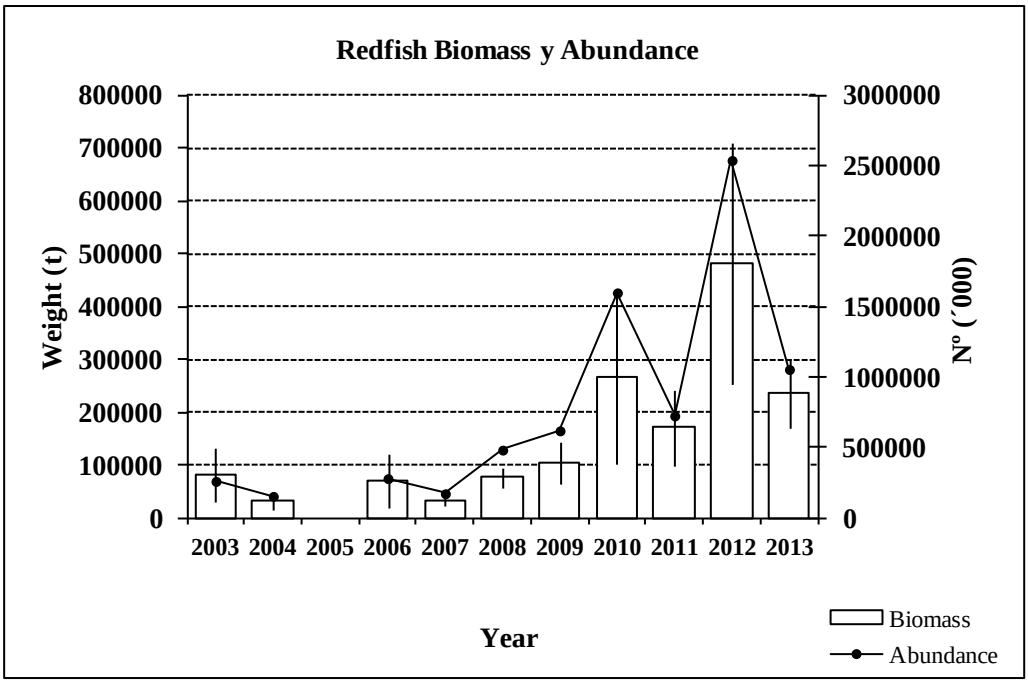

FIGURE 10.- Redfish abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

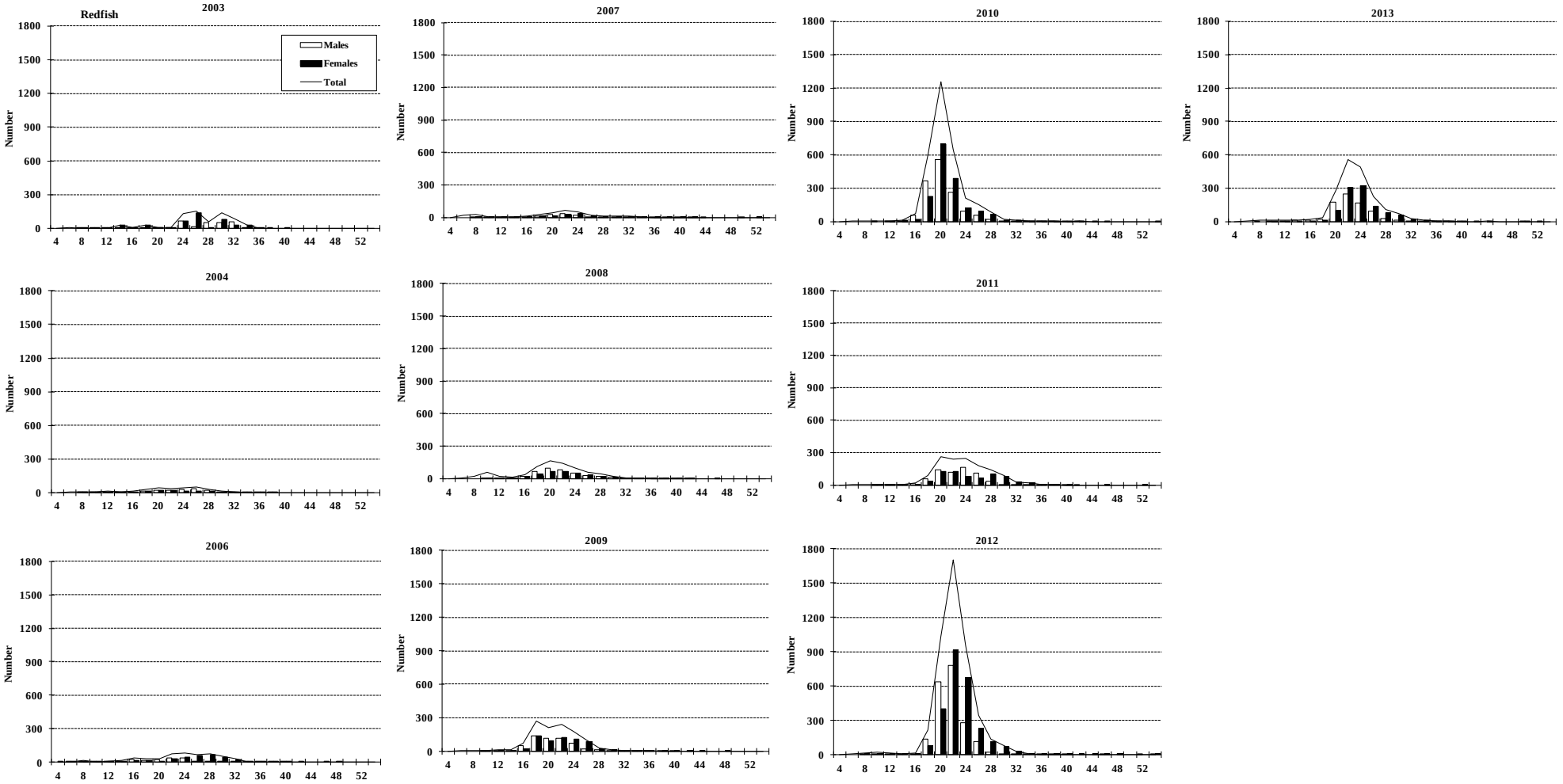

FIGURE 11.- Redfish length distribution (cm) in NAFO 3L: 2003-2013. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

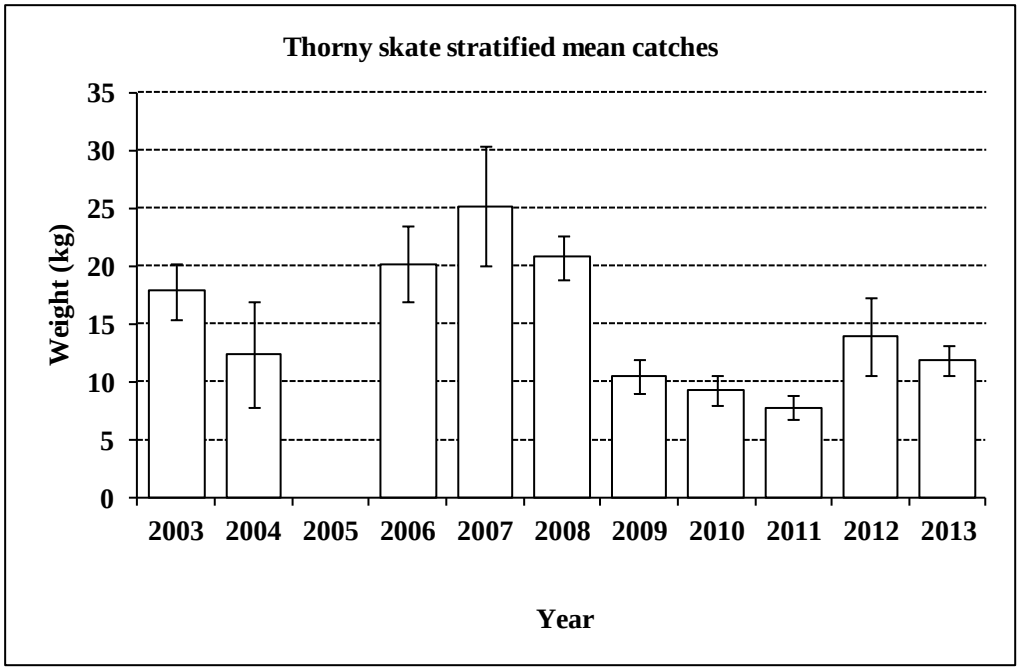

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FIGURE 12.- Thorny skate stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

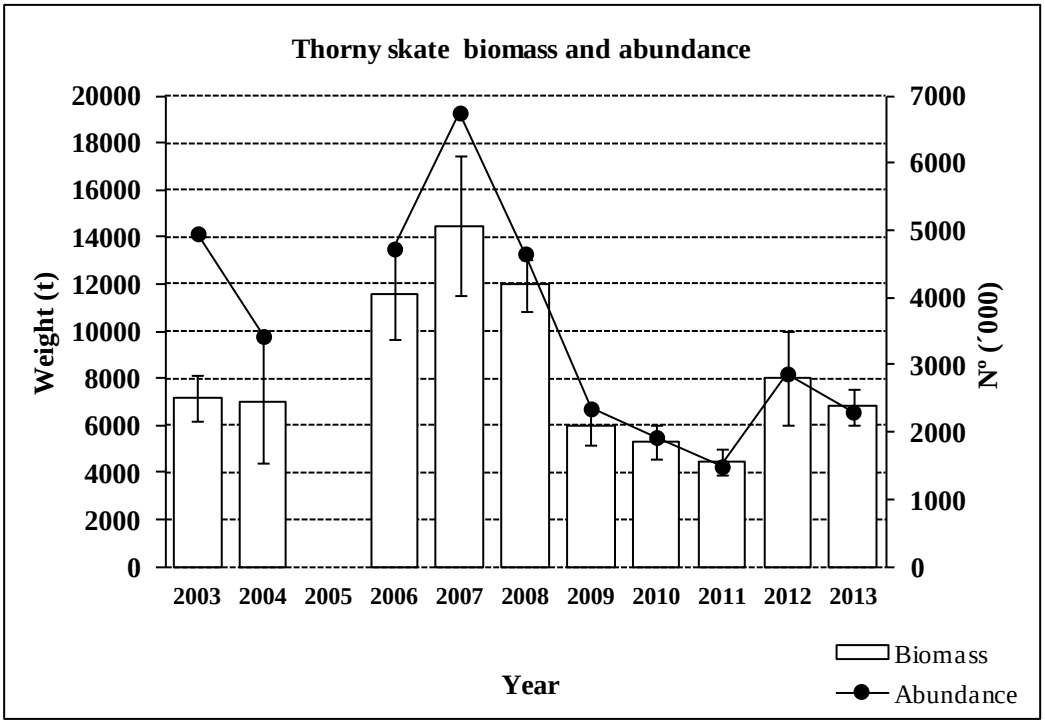


FIGURE 13.- Thorny skate abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

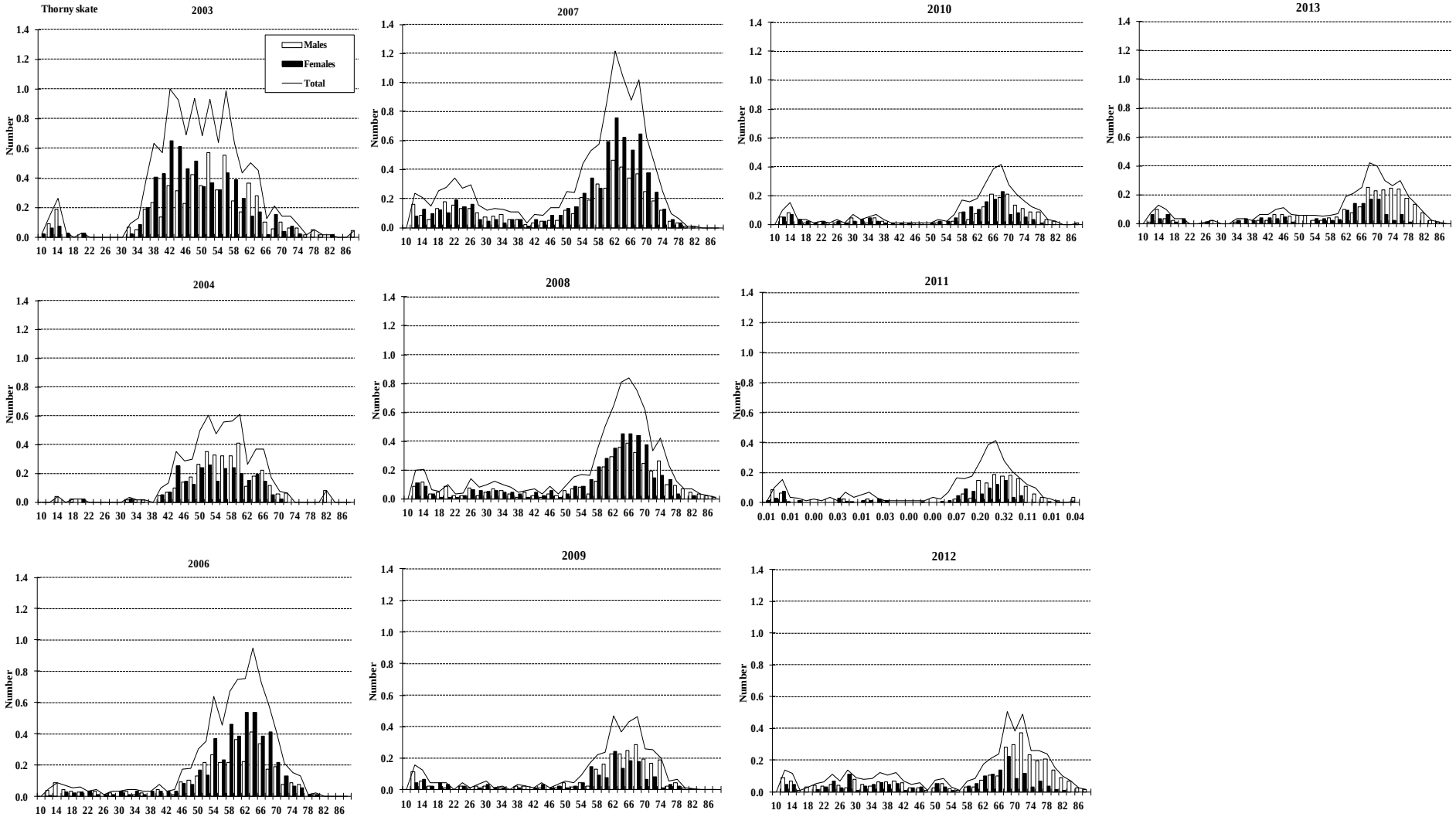
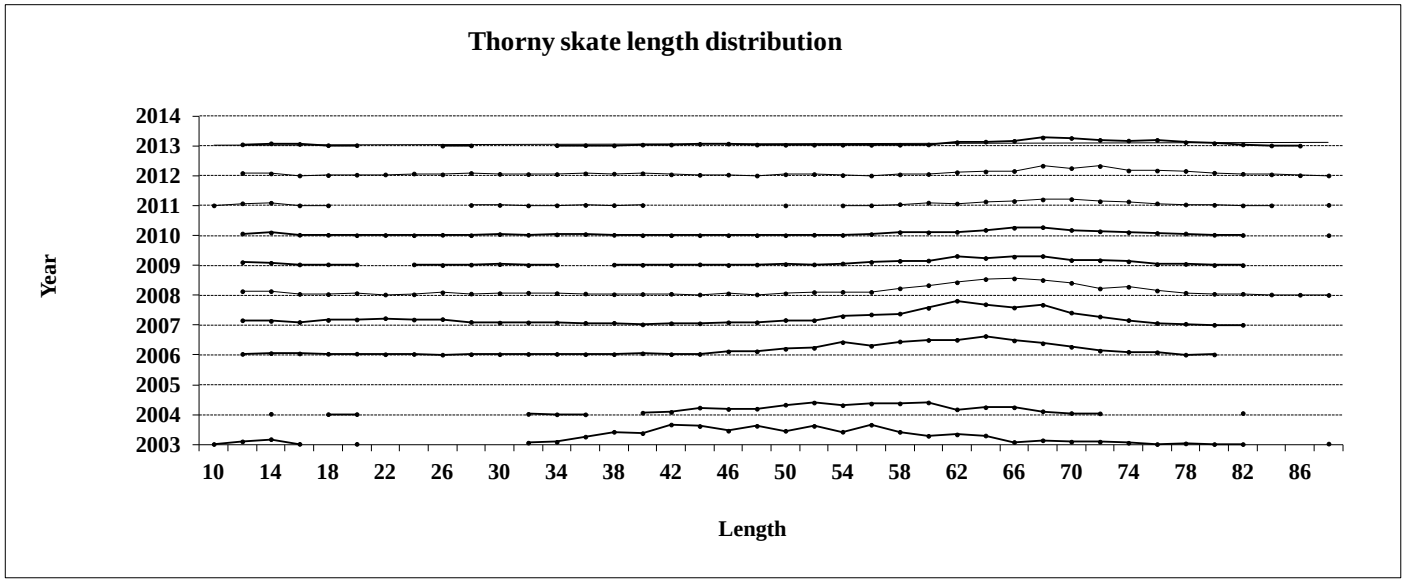


FIGURE 14.- Thorny skate length distribution (cm) in NAFO 3L: 2003-2013. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2013.



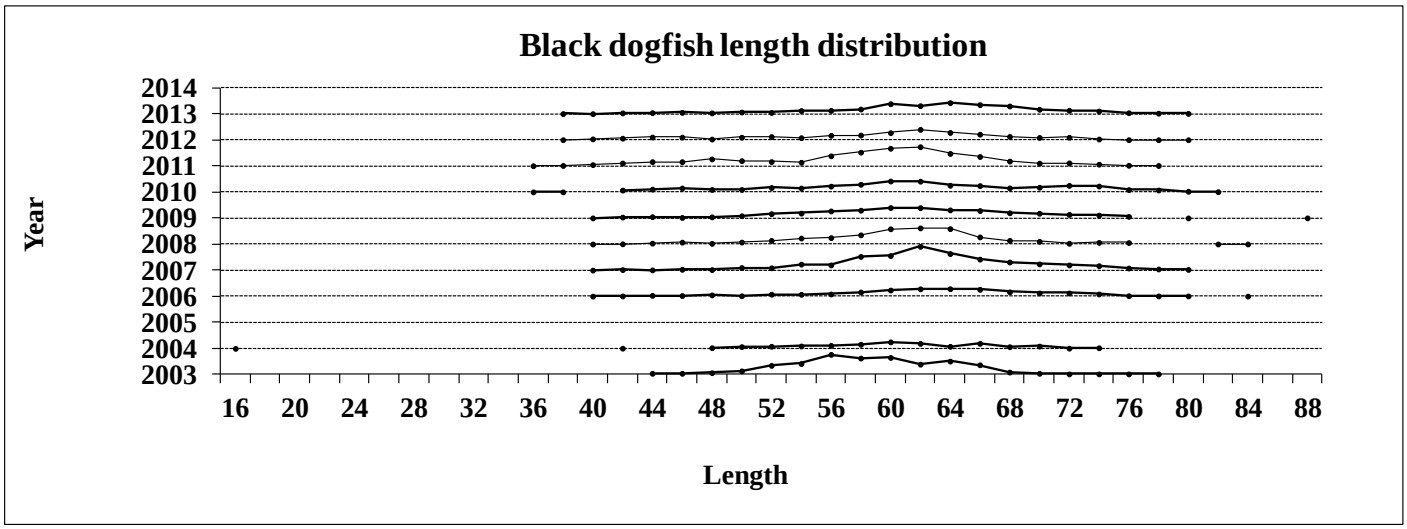


FIGURE 15.- Thorny skate and **black length** distribution (cm) in NAFO 3L: 2003-2013.

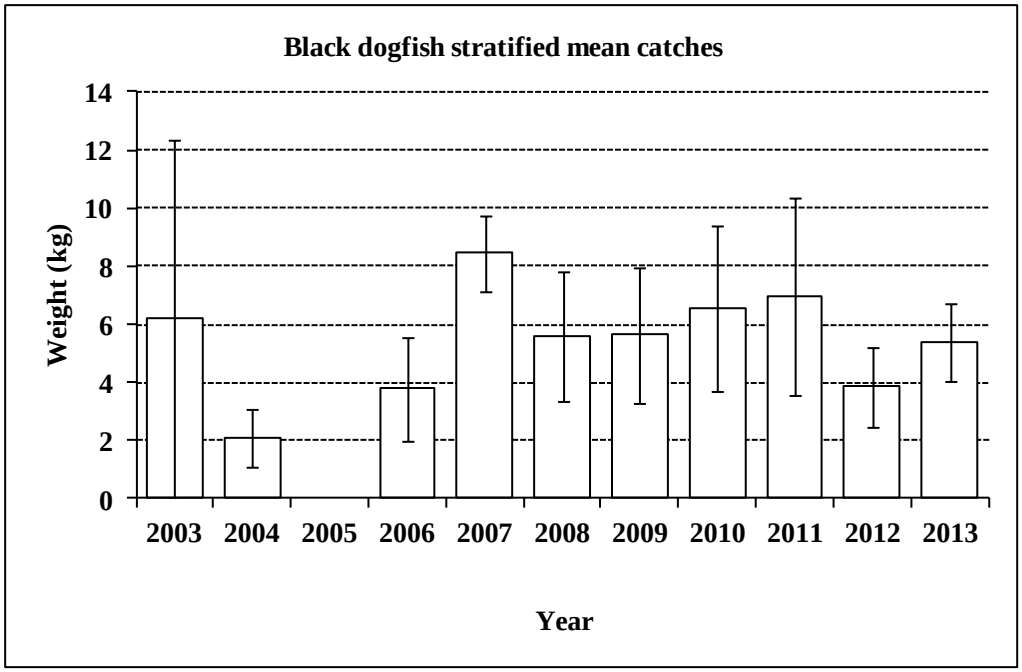


FIGURE 16.- Black dogfish stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

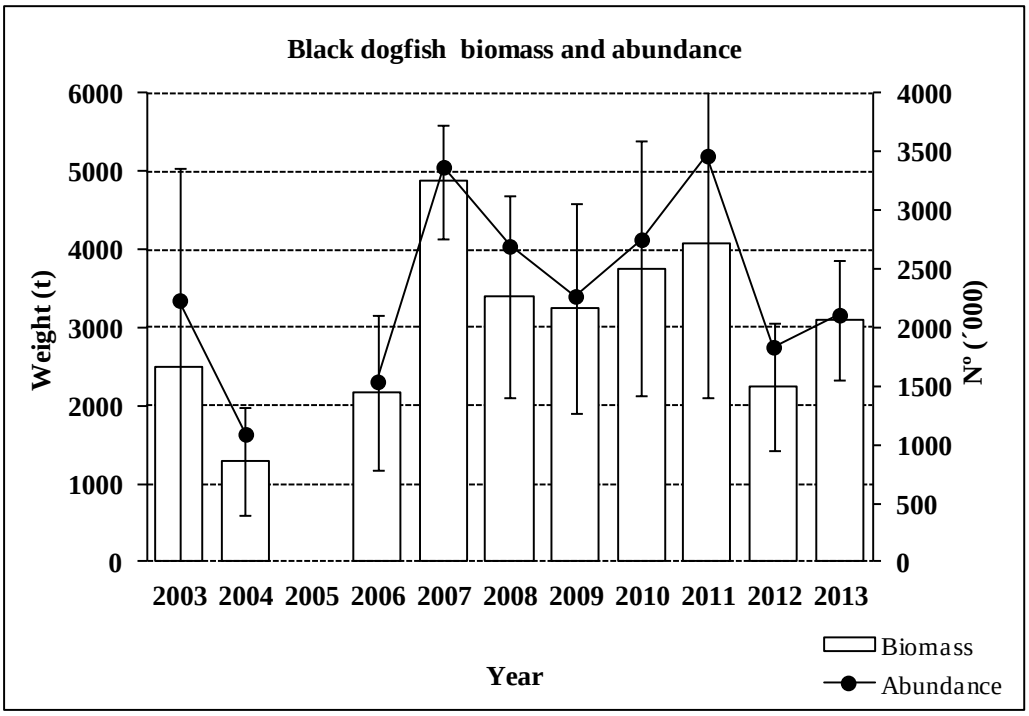


FIGURE 17.- Black dogfish abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2013 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2013.

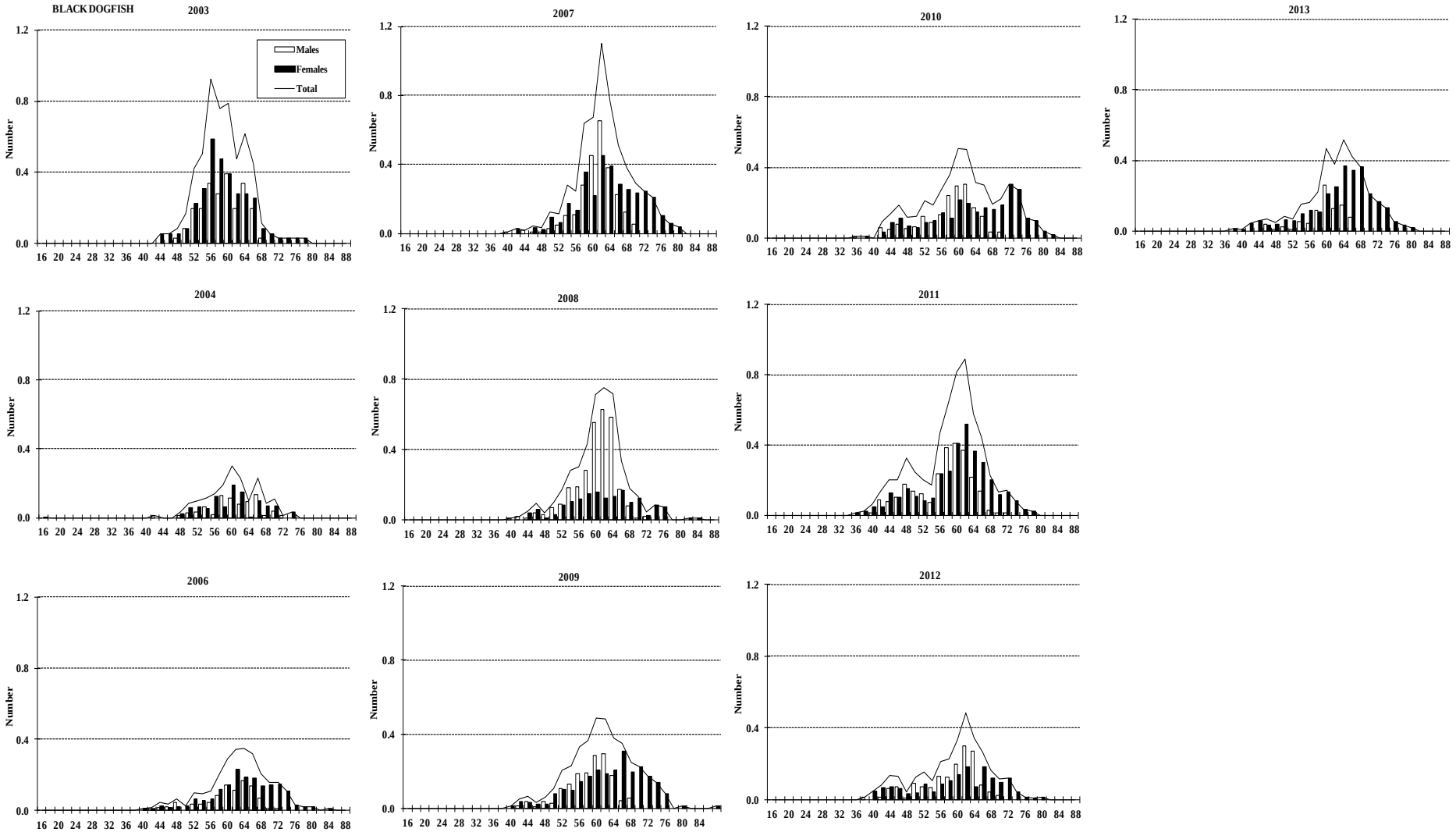


FIGURE 18.- Black dogfish length distribution (cm) in NAFO 3L: 2003-2013. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2013.