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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 2003-2016

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 2003-2016.

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*., 2017.

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 2003-2016. 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 / Weight=a(Length+0.25)^b. To calculate the parameters for the indeterminate individuals, we used the total data (males+females+indeterminate individuals).

Results

Atlantic Cod (*Gadus morhua* Linnaeus, 1758)

NAFO manages 3 cod stocks in Div. 3L, 3M (Flemish Cap) and 3NO (southern Gran Bank). 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, 2016).

The cod fishery on Flemish Cap has traditionally been a directed fishery by Portuguese trawlers and gillnetters, Spanish pair-trawlers and Faroese longliners. By-catch occurs primarily in the yellowtail flounder, skate and redfish fisheries.

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 (2003-2016) 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 (2006-2016).

Figure 3 shows a map with the distribution of Atlantic cod catches per haul in 2016 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 (2003-2016). 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, increased briefly in 2013 and 2014 declined again. The index increased in 2015 but declined again in 2016.

Length distribution

Table 6 presents the length distribution of stratified mean catches per haul for this species, by sex and year (2006-2016), 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 41-58 cm. In 2014 the mode is in 38 cm. and in 2015-2016 the dominant lengths were between 22 and 44 cm (mode = 30-32 cm in 2015 and 34 cm in 2016).

In last years no good recruitments were seen.

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. Most of the catches were taken in Divs. 3LMN by Spain, Portugal and Russia fleets.

Roughhead grenadier is taken mainly in Div. 3LMN of NAFO Regulatory Area. The highest level of observed catches was reached in 1998. Survey indices indicate a stable or declining stock in recent years. Fishing mortality indices have remained at low levels since 2005. Roughhead grenadier is not a regulated species (NAFO, 2016).

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 (2003-2016) of biomass and their SD estimates of this species are shown in Table 9 and length-weight relationships are shown in Table 5 (2006-2016).

The Roughhead grenadier biomass index from 2006 to 2008 was stable and since then presents a clear decreasing trend, reaching the time series minimum in 2012. In the period 2012-2015 the index has increased to levels similar to its maximum (2008).

In 2015 the biomass increased, reaching the second highest value of the series and the values of these indices declined again in 2016 (Fig. 6 and 7). Figure 3 shows a map with the distribution of roughhead grenadier catches per haul in 2016 Spanish 3L survey.

Length distribution

Table 10 shows the stratified mean catches per haul length distribution, for roughhead grenadier, by sex and year (2006-2016), 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 (mode =16 cm). In 2016, the modes observed were 6.5 and 15.5 cm and the dominant lengths were between 5.5 and 24.5 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 and have reached just over 5 781t and 10 200t in 2014 and 2015, the highest level recorded since 1993. Catches from EU-Portugal, Russian and Canadian fleets justified most of the increase on the redfish catch observed on Divisions 3L (NAFO, 2016).

Mean catches and biomass

Table 11 shows the swept area, the tow number, the mean catches per haul and year (2006-2016) 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 2016 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, 2007 and 2011 with a great decrease in 2013. In 2014 the biomass remains at the same value as the last year; 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). Redfish biomass indices decreased since 2013. The length-weight relationships are presented in Table 5 (2006-2016).

Length distribution

Table 14 presents the length distribution of the stratified mean catches per haul for redfish, by sex and year (2006-2016), 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 2010-2012. In 2016, the mode observed was 24 cm and the dominant lengths were between 20 and 36 cm.

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 the NRA of Divs. 3LNO. In 2010 and 2011, the TAC for was reduced to 12 000 t. The TAC was further reduced to 8 500 t for 2012, and to 7 000 t for 2013-2016. Based on the continuous distribution and lack of physical barriers between Div. 3LNO and Subdiv. 3Ps, thorny skate in Div. 3LNOPs is considered to constitute a single stock. Div. 3LNO is managed by NAFO. The stock has been increasing very slowly from low levels since the mid-1990s (NAFO, 2016).

Mean catches and biomass

Table 15 shows the swept area, the tow number, the mean catches per haul and year (2006-2016) and their variance for thorny skate. Table 16 presents the length-weight relationships (2006-2016). 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. The thorny skate indices increased slightly in the period 2014-2015 and decreased again in 2016.

Figure 3 shows a map with the distribution of thorny skate catches per haul in 2016 Spanish 3L survey.

Length distribution

Table 19 presents the stratified mean catches per haul length distribution for this species, by sex and year (2006-2016), 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 and 2015. In 2016, the modes observed were 34 and 69 cm and the dominant lengths were between 24-80 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 (2003-2016) of biomass and their SD estimates of black dogfish are shown in Table 22. Length-weight relationships are presented in Table 16 (2006-2016).

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. 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 2015 the biomass increased, reaching the highest value of the series and it decrease at the same level than in 2014 (Fig. 16 and 17). Figure 3 shows a map with the distribution of black dogfish catches per haul in 2016 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 (2006-2016), 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 37 cm). Size compositions are mainly between 46 and 76 cm of length. In 2016 the observed mode was 60 cm and the dominant lengths were between 46 and 72 cm.

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Table 1.- Spanish bottom trawl surveys in NAFO Division 3L for the period 2003-2016.

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
2014	R/V "*Vizconde de Eza"*	102	104-1411	24	July 30 - August 19
2015	R/V "*Vizconde de Eza"*	97	112-1458	24	July 28 - August 17
2016	R/V "*Vizconde de Eza"*	98	126-1447	24	July 28 - August 17

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 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2006				2007				2008				2009				2010			
	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	0.0229	2	1.783	2.521	0.0225	2	0.835	1.181	0.0229	2	6.051	6.537	0.0225	2	5.285	3.514	0.0225	2	0.775	1.096
387	0.0225	2	0.395	0.559	0.0225	2	1.992	1.105	0.0435	4	5.386	5.633	0.0439	4	23.204	40.440	0.0458	4	3.433	2.594
388	0.0566	5	7.028	5.142	0.0563	5	7.434	7.400	0.0559	5	18.665	19.454	0.0555	5	7.413	3.853	0.0570	5	61.988	121.458
389	0.0795	7	10.582	14.986	0.0900	8	4.162	4.621	0.0780	7	30.523	18.566	0.0803	7	40.874	54.955	0.0795	7	150.908	266.990
390	0.1249	11	0.081	0.249	0.1350	12	1.369	1.251	0.1395	12	8.682	15.848	0.1373	12	22.441	43.094	0.1249	11	37.143	51.671
391	0.0450	4	14.338	13.278	0.0450	4	11.183	15.378	0.0454	4	342.268	637.574	0.0458	4	65.264	62.051	0.0454	4	144.075	119.143
392	0.0229	2	2.045	1.506	0.0225	2	13.985	7.779	0.0221	2	0.000	0.000	0.0229	2	0.063	0.089	0.0225	2	70.680	89.265
729	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	0.0338	3	0.000	0.000
730	0.0326	3	0.000	0.000	0.0225	2	0.000	0.000	0.0323	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	0.510	0.883	0.0330	3	0.130	0.225	0.0341	3	0.000	0.000	0.0338	3	0.247	0.225
732	0.0334	3	0.000	0.000	0.0338	3	0.000	0.000	0.0446	4	0.000	0.000	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000
733	0.0454	4	0.000	0.000	0.0338	3	0.427	0.739	0.0431	4	0.000	0.000	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000
734	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000
741	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000
742	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000
743	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000	0.0203	2	0.000	0.000	0.0225	2	0.000	0.000
744	0.0229	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0210	2	0.000	0.000	0.0229	2	0.000	0.000
745	0.0686	6	0.000	0.000	0.0675	6	0.000	0.000	0.0555	5	0.000	0.000	0.0559	5	0.000	0.000	0.0563	5	0.000	0.000
746	0.0675	6	0.000	0.000	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000	0.0668	6	0.000	0.000	0.0679	6	0.000	0.000
747	0.1230	11	0.000	0.000	0.1238	11	0.000	0.000	0.1069	10	0.000	0.000	0.1118	10	0.000	0.000	0.1125	10	0.000	0.000
748	0.0326	3	0.000	0.000	0.0338	3	0.000	0.000	0.0218	2	0.000	0.000	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000
749	0.0229	2	0.000	0.000	0.0113	1	0.000	-	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000
750	0.1005	9	0.000	0.000	0.0679	6	0.000	0.000	0.0844	8	0.000	0.000	0.0791	7	0.000	0.000	0.0900	8	0.000	0.000
751	0.0454	4	0.000	0.000	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000	0.0338	3	0.000	0.000	0.0225	2	0.000	0.000

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

Table 2 (cont.). Swept area, number of hauls and **Atlantic cod** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2011				2012				2013				2014				2015			
	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	0.0229	2	93.750	118.723	0.0225	2	4.820	2.871	0.0229	2	4.556	4.144	0.0225	2	8.360	8.712	0.0236	2	8.271	9.279
387	0.0450	4	36.505	32.228	0.0450	4	6.760	4.899	0.0450	4	92.938	97.705	0.0461	4	39.932	36.630	0.0458	4	17.995	19.617
388	0.0563	5	15.241	14.829	0.0570	5	162.020	264.788	0.0570	5	91.360	68.284	0.0585	5	28.395	23.211	0.0574	5	23.188	18.824
389	0.0675	6	26.796	42.096	0.0799	7	34.169	26.422	0.0791	7	74.413	71.762	0.0814	7	26.084	37.415	0.0814	7	70.861	40.597
390	0.1009	9	217.889	231.959	0.1354	12	43.245	27.872	0.1358	12	42.393	23.638	0.1369	12	20.592	24.738	0.1260	11	10.735	8.941
391	0.0458	4	150.275	91.993	0.0458	4	44.280	47.163	0.0450	4	14.288	19.423	0.0465	4	13.695	17.396	0.0465	4	24.148	22.449
392	0.0229	2	3.268	3.129	0.0225	2	13.470	4.992	0.0225	2	27.297	2.626	0.0225	2	1.485	0.092	0.0229	2	2.669	0.471
729	0.0338	3	0.000	0.000	0.0338	3	0.000	0.000	0.0341	3	0.759	1.314	0.0338	3	0.000	0.000	0.0345	3	0.000	0.000
730	0.0334	3	0.000	0.000	0.0338	3	0.000	0.000	0.0334	3	0.000	0.000	0.0345	3	0.000	0.000	0.0345	3	0.000	0.000
731	0.0334	3	0.000	0.000	0.0341	3	0.000	0.000	0.0334	3	0.173	0.300	0.0345	3	0.000	0.000	0.0345	3	1.540	2.667
732	0.0454	4	0.000	0.000	0.0454	4	0.000	0.000	0.0450	4	0.000	0.000	0.0454	4	0.000	0.000	0.0465	4	0.000	0.000
733	0.0454	4	0.545	0.642	0.0454	4	0.000	0.000	0.0450	4	5.008	7.845	0.0458	4	0.107	0.213	0.0454	4	0.349	0.492
734	0.0225	2	0.000	0.000	0.0233	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.085	0.120	0.0225	2	0.000	0.000
741	0.0218	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0236	2	0.000	0.000
742	0.0225	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0233	2	0.000	0.000
743	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0233	2	0.000	0.000
744	0.0221	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	0.0225	2	0.000	0.000
745	0.0446	4	0.000	0.000	0.0570	5	0.000	0.000	0.0559	5	0.000	0.000	0.0578	5	0.000	0.000	0.0578	5	0.000	0.000
746	0.0566	5	0.000	0.000	0.0675	6	0.000	0.000	0.0675	6	0.000	0.000	0.0683	6	0.000	0.000	0.0686	6	0.000	0.000
747	0.0893	8	0.000	0.000	0.1121	10	0.000	0.000	0.1125	10	0.000	0.000	0.1125	10	0.000	0.000	0.1028	9	0.000	0.000
748	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0233	2	0.000	0.000
749	0.0221	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	0.0225	2	0.000	0.000
750	0.0668	6	0.000	0.000	0.0885	8	0.000	0.000	0.0896	8	0.000	0.000	0.0904	8	0.000	0.000	0.0934	8	0.000	0.000
751	0.0334	3	0.000	0.000	0.0218	2	0.000	0.000	0.0446	4	0.000	0.000	0.0334	3	0.000	0.000	0.0341	3	0.000	0.000

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

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 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2016																			
	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	0.0233	2	2.847	0.222																
387	0.0454	4	64.128	110.507																
388	0.0570	5	13.467	11.849																
389	0.0814	7	25.386	33.591																
390	0.1391	12	8.767	8.308																
391	0.0469	4	23.023	14.537																
392	0.0233	2	23.726	29.803																
729	0.0341	3	0.000	0.000																
730	0.0233	2	0.000	0.000																
731	0.0345	3	5.050	8.106																
732	0.0454	4	0.163	0.325																
733	0.0458	4	1.675	2.521																
734	0.0229	2	0.000	0.000																
741	0.0233	2	0.000	0.000																
742	0.0229	2	0.000	0.000																
743	0.0229	2	0.000	0.000																
744	0.0229	2	0.000	0.000																
745	0.0574	5	0.000	0.000																
746	0.0690	6	0.000	0.000																
747	0.1140	10	0.000	0.000																
748	0.0233	2	0.000	0.000																
749	0.0233	2	0.000	0.000																
750	0.0930	8	0.000	0.000																
751	0.0345	3	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 (2003-2016) 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 2006-2016.

	Survey												
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	7.26	53.10	210.34	98.53	713.96	623.63	91.45	11062.50	568.76	537.61	986.48	975.98	335.95
387	1123.84	482.56	101.12	509.82	1378.75	5940.16	878.72	9345.28	1730.43	23792.19	10222.59	4606.72	16416.64
388	2809.59	468.74	2509.00	2653.87	6663.55	2646.51	22129.72	5441.04	57841.14	32615.52	10136.94	8278.04	4807.65
389	429.34	259.59	5386.31	2118.59	15536.35	20804.94	76812.24	13639.08	17391.88	37876.07	13276.54	36068.25	12921.69
390	0.00	0.00	65.94	1115.80	7076.10	18289.28	30271.32	177579.44	35245.01	34550.09	16782.48	8749.32	7144.97
391	47.00	0.00	4043.18	3153.47	96519.44	18404.45	40629.15	42377.55	12486.96	4029.29	3862.06	6809.67	6492.35
392	58.00	1916.68	296.53	2027.75	0.00	9.14	10248.60	473.79	1953.15	3958.07	215.33	387.01	3440.27
729	234.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	141.11	0.00	0.00	0.00
730	0.00	0.00	0.00	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	0.00	332.64	1090.80
732	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	37.54
733	n.s	0.00	0.00	99.84	0.00	0.00	0.00	127.59	0.00	1171.76	24.92	81.67	391.95
734	n.s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.01	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	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	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	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	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	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	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	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	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	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	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	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	55520.34	53079.8
$(\overline{y})$	2.13	0.53	-	1.94	1.83	19.72	10.28	27.92	40.09	19.61	21.38	8.56	8.18
SD	0.57	0.30	-	0.55	0.42	13.89	2.75	9.17	10.15	6.72	3.47	1.74	2.5

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 2006-2016.

					Survey								
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	1	5	18	9	62	55	8	967	51	47	88	83	29
387	98	45	9	45	127	542	77	831	154	2115	887	403	1447
388	253	45	222	236	596	238	1941	484	5074	2861	866	721	422
389	38	23	474	188	1394	1815	6763	1212	1524	3351	1142	3103	1112
390	0	0	6	99	609	1599	2667	15844	3124	3054	1471	764	616
391	4	0	359	280	8509	1609	3582	3705	1092	358	332	586	554
392	5	179	26	180	0	1	911	41	174	352	19	34	296
729	22	0	0	0	0	0	0	0	0	12	0	0	0
730	0	0	0	0	0	0	0	0	0	0	0	0	0
731	423	9	0	10	3	0	5	0	0	3	0	29	95
732	0	0	0	0	0	0	0	0	0	0	0	0	3
733	n.s	0	0	9	0	0	0	11	0	104	2	7	34
734	n.s	0	0	0	0	0	0	0	0	0	1	0	0
741	0	0	0	0	0	0	0	0	0	0	0	0	0
742	0	0	0	0	0	0	0	0	0	0	0	0	0
743	n.s	0	0	0	0	0	0	0	0	0	0	0	0
744	n.s	0	0	0	0	0	0	0	0	0	0	0	0
745	0	0	0	0	0	0	0	0	0	0	0	0	0
746	0	0	0	0	0	0	0	0	0	0	0	0	0
747	n.s	0	0	0	0	0	0	0	0	0	0	0	0
748	0	0	0	0	0	0	0	0	0	0	0	0	0
749	0	0	0	0	0	0	0	0	0	0	0	0	0
750	n.s	0	0	0	0	0	0	0	0	0	0	0	0
751	n.s	n.s	0	0	0	0	0	0	0	0	0	0	0
TOTAL	844	306	1114	1057	11300	5859	15953	23095	11192	12258	4809	5729	4608
SD	222	180	315	245	7745	1556	5265	5833	3877	1984	1001	829	1397

Table 5. Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2006-2016 for **Atlantic cod, roughhead grenadier and redfish**.

	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

Table 5 (cont.).Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2006-201 for **Atlantic cod, roughhead grenadier and redfish**.

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	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
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	$W = 0.0130\ L3^{0.0249}$	497	0.9803
	Females	$W = 0.0073\ L^{3.0554}$	932	0.993	Females	$W = 0.0995\ L^{2.9248}$	1036	0.991	Females	$W = 0.0132\ L3^{0.0237}$	522	0.9822
2014	All	$W = 0.0071\ L^{3.0532}$	685	0.990	All	$W = 0.1003\ L^{2.9350}$	1604	0.992	All	$W = 0.0094\ L^{3.1208}$	925	0.9840
	Males	$W = 0.0067\ L^{3.0666}$	317	0.987	Males	$W = 0.0958\ L^{2.9529}$	582	0.987	Males	$W = 0.0161\ L^{2.9557}$	424	0.981
	Females	$W = 0.0076\ L^{3.0345}$	365	0.991	Females	$W = 0.1091\ L^{2.9071}$	940	0.992	Females	$W = 0.0121\ L3^{0.0495}$	457	0.9624
2015	All	$W = 0.0079\ L^{3.0271}$	867	0.989	All	$W = 0.1107\ L^{2.9089}$	1832	0.993	All	$W = 0.0088\ L^{3.1436}$	1088	0.9909
	Males	$W = 0.0080\ L^{3.0280}$	393	0.989	Males	$W = 0.1127\ L^{2.9084}$	662	0.987	Males	$W = 0.0148\ L^{2.9886}$	500	0.9893
	Females	$W = 0.0080\ L^{3.0264}$	473	0.989	Females	$W = 0.1197\ L^{2.8800}$	1097	0.992	Females	$W = 0.0104\ L^{3.0946}$	554	0.9898
2016	All	$W = 0.0078\ L^{3.0345}$	590	0.986	All	$W = 0.0972\ L^{2.9511}$	1525	0.989	All	$W = 0.0088\ L^{3.1297}$	908	0.9925
	Males	$W = 0.0074\ L^{3.0493}$	289	0.984	Males	$W = 0.0926\ L^{2.9755}$	603	0.985	Males	$W = 0.0179\ L^{2.9154}$	377	0.9771
	Females	$W = 0.0081\ L^{3.0222}$	301	0.988	Females	$W = 0.1024\ L^{2.9304}$	885	0.989	Females	$W = 0.0136\ L3^{0.0075}$	409	0.9808

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: 2006-2016 (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: 2006-2016 (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	0.0 0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.02
12	0.00	0.00	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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	0.0 0	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 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: 2006-2016 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2014				2015				2016							
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
<12	0.01	0.01	0.02	0.04	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.02				
12	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01				
14	0.01	0.04	0.00	0.05	0.00	0.00	0.00	0.00	0.02	0.04	0.00	0.06				
16	0.02	0.01	0.00	0.03	0.01	0.00	0.00	0.01	0.06	0.02	0.00	0.08				
18	0.01	0.03	0.00	0.04	0.11	0.07	0.00	0.18	0.01	0.03	0.00	0.04				
20	0.02	0.07	0.00	0.08	0.25	0.12	0.00	0.37	0.10	0.09	0.00	0.19				
22	0.09	0.14	0.00	0.23	0.51	0.47	0.00	0.98	0.16	0.09	0.00	0.25				
24	0.12	0.11	0.00	0.23	0.60	0.69	0.00	1.28	0.17	0.25	0.00	0.43				
26	0.16	0.28	0.00	0.44	0.85	0.91	0.00	1.75	0.40	0.36	0.00	0.75				
28	0.19	0.17	0.00	0.36	0.79	0.86	0.00	1.65	0.51	0.54	0.00	1.06				
30	0.24	0.23	0.00	0.47	0.90	0.90	0.00	1.80	0.42	0.63	0.00	1.05				
32	0.28	0.23	0.00	0.52	1.08	0.72	0.00	1.80	0.80	0.61	0.00	1.42				
34	0.38	0.38	0.00	0.76	0.68	0.68	0.00	1.36	1.05	0.80	0.00	1.85				
36	0.63	0.39	0.00	1.02	0.66	0.62	0.00	1.28	0.90	0.83	0.00	1.74				
38	0.55	0.62	0.00	1.17	0.68	0.63	0.00	1.31	0.68	0.57	0.00	1.25				
40	0.43	0.41	0.00	0.84	0.49	0.42	0.00	0.90	0.46	0.56	0.00	1.02				
42	0.36	0.45	0.00	0.81	0.28	0.44	0.00	0.72	0.42	0.33	0.00	0.76				
44	0.18	0.34	0.00	0.52	0.37	0.50	0.00	0.88	0.37	0.28	0.00	0.65				
46	0.23	0.23	0.00	0.47	0.28	0.28	0.00	0.56	0.28	0.32	0.00	0.60				
48	0.24	0.27	0.00	0.51	0.24	0.34	0.00	0.58	0.19	0.23	0.00	0.43				
50	0.24	0.26	0.00	0.50	0.26	0.22	0.00	0.48	0.17	0.17	0.00	0.34				
52	0.15	0.27	0.00	0.42	0.10	0.11	0.00	0.22	0.09	0.10	0.00	0.18				
54	0.16	0.19	0.00	0.35	0.21	0.13	0.00	0.33	0.14	0.11	0.00	0.25				
56	0.09	0.18	0.00	0.27	0.13	0.18	0.00	0.31	0.03	0.05	0.00	0.08				
58	0.12	0.18	0.00	0.30	0.07	0.14	0.00	0.21	0.04	0.02	0.00	0.06				
60	0.06	0.09	0.00	0.15	0.04	0.10	0.00	0.13	0.07	0.03	0.00	0.10				
62	0.05	0.10	0.00	0.15	0.11	0.06	0.00	0.16	0.04	0.08	0.00	0.11				
64	0.02	0.10	0.00	0.12	0.05	0.02	0.00	0.07	0.03	0.04	0.00	0.07				
66	0.02	0.05	0.00	0.08	0.03	0.02	0.00	0.06	0.01	0.00	0.00	0.01				
68	0.02	0.02	0.00	0.04	0.00	0.01	0.00	0.01	0.03	0.01	0.00	0.04				
70	0.01	0.04	0.00	0.05	0.02	0.01	0.00	0.03	0.00	0.01	0.00	0.01				
72	0.00	0.04	0.00	0.04	0.01	0.02	0.00	0.04	0.00	0.00	0.00	0.00				
74	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.02	0.00	0.01	0.00	0.01				
76	0.00	0.02	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
78	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01	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				
82	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01				
84	0.01	0.00	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				
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				
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				
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				
Total	5.12	5.97	0.03	11.12	9.83	9.68	0.00	19.51	7.68	7.24	0.00	14.93				
Nº samples:				38				39				39				
Nº Ind.:	463	546	3	1012	848	840	0	1688	618	589	0	1207				
Sampled catch:				806				927				774				
Range:				9-84				17-79				9-83				
Total catch:				806				927				774				
Total valid hauls:				99				97				98				

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 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2006				2007				2008				2009				2010			
	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	0.0229	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
387	0.0225	2	34.790	20.520	0.0225	2	45.990	51.746	0.0435	4	20.320	11.817	0.0439	4	30.045	16.013	0.0458	4	14.399	12.704
388	0.0566	5	26.406	7.803	0.0563	5	37.663	22.136	0.0559	5	15.056	11.298	0.0555	5	27.627	27.428	0.0570	5	17.174	8.563
389	0.0795	7	1.426	2.642	0.0900	8	3.075	8.697	0.0780	7	19.007	23.458	0.0803	7	31.105	63.627	0.0795	7	8.231	10.443
390	0.1249	11	0.000	0.000	0.1350	12	0.000	0.000	0.1395	12	0.580	1.338	0.1373	12	4.648	14.283	0.1249	11	1.071	3.295
391	0.0450	4	178.123	304.579	0.0450	4	86.525	171.255	0.0454	4	248.947	142.328	0.0458	4	72.878	56.298	0.0454	4	169.525	25.560
392	0.0229	2	118.025	159.347	0.0225	2	129.950	138.805	0.0221	2	58.175	54.836	0.0229	2	60.934	78.701	0.0225	2	35.050	15.203
729	0.0338	3	25.164	23.944	0.0338	3	26.490	13.222	0.0338	3	19.943	6.923	0.0341	3	9.991	5.382	0.0338	3	10.817	4.348
730	0.0326	3	53.270	7.021	0.0225	2	81.378	33.061	0.0323	3	35.119	29.483	0.0338	3	75.453	99.963	0.0334	3	26.400	4.084
731	0.0341	3	10.512	3.252	0.0338	3	14.333	7.365	0.0330	3	14.333	10.000	0.0341	3	4.980	1.654	0.0338	3	10.508	7.656
732	0.0334	3	22.164	9.200	0.0338	3	11.151	3.253	0.0446	4	21.545	3.045	0.0450	4	8.289	3.314	0.0450	4	16.060	6.489
733	0.0454	4	23.450	16.806	0.0338	3	19.104	14.162	0.0431	4	23.939	36.979	0.0450	4	19.108	13.978	0.0450	4	8.785	9.702
734	0.0225	2	39.315	9.638	0.0225	2	23.400	8.202	0.0221	2	30.580	20.182	0.0218	2	28.777	12.760	0.0225	2	65.625	48.826
741	0.0218	2	17.557	23.112	0.0225	2	4.650	6.166	0.0210	2	10.359	10.390	0.0221	2	11.334	6.316	0.0225	2	14.350	3.606
742	0.0229	2	20.933	7.015	0.0225	2	14.493	2.011	0.0210	2	16.861	11.943	0.0214	2	3.425	1.803	0.0225	2	3.870	1.987
743	0.0225	2	10.574	6.353	0.0225	2	29.666	25.928	0.0203	2	25.509	13.847	0.0203	2	13.278	13.438	0.0225	2	30.937	37.283
744	0.0229	2	15.365	15.111	0.0218	2	33.965	0.375	0.0221	2	58.670	15.570	0.0210	2	8.208	6.495	0.0229	2	13.319	1.031
745	0.0686	6	8.238	5.438	0.0675	6	3.624	1.509	0.0555	5	14.284	7.402	0.0559	5	3.787	2.256	0.0563	5	7.959	3.864
746	0.0675	6	41.767	29.972	0.0664	6	34.607	22.333	0.0638	6	30.720	16.486	0.0668	6	23.474	20.537	0.0679	6	13.030	7.624
747	0.1230	11	42.307	40.112	0.1238	11	62.510	26.732	0.1069	10	28.717	25.198	0.1118	10	33.180	25.868	0.1125	10	36.785	18.008
748	0.0326	3	67.920	73.796	0.0338	3	33.533	16.455	0.0218	2	217.340	286.322	0.0229	2	92.330	127.477	0.0225	2	50.350	51.548
749	0.0229	2	25.930	31.919	0.0113	1	28.700	-	0.0214	2	47.452	11.670	0.0225	2	13.700	9.334	0.0229	2	20.482	26.189
750	0.1005	9	16.866	18.117	0.0679	6	19.516	24.114	0.0844	8	11.937	6.673	0.0791	7	16.895	14.145	0.0900	8	12.763	11.150
751	0.0454	4	4.253	3.543	0.0225	2	24.445	7.983	0.0413	4	9.038	8.141	0.0338	3	88.193	144.495	0.0225	2	22.150	8.980

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

Table 7 (cont.). Swept area, number of hauls and **roughhead grenadier** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2011				2012				2013				2014				2015			
	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	0.0229	2	1.010	1.428	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0236	2	0.000	0.000
387	0.0450	4	11.304	9.250	0.0450	4	16.012	11.119	0.0450	4	48.039	29.999	0.0461	4	34.291	36.472	0.0458	4	56.143	42.743
388	0.0563	5	5.022	4.969	0.0570	5	14.019	22.081	0.0570	5	11.737	9.670	0.0585	5	19.183	19.378	0.0574	5	35.214	22.023
389	0.0675	6	4.711	3.126	0.0799	7	11.893	9.022	0.0791	7	7.694	11.153	0.0814	7	4.613	7.433	0.0814	7	14.689	18.122
390	0.1009	9	2.856	7.168	0.1354	12	0.000	0.000	0.1358	12	0.418	0.995	0.1369	12	0.203	0.530	0.1260	11	0.173	0.573
391	0.0458	4	153.179	92.811	0.0458	4	21.670	8.743	0.0450	4	6.940	6.438	0.0465	4	18.675	19.226	0.0465	4	118.535	108.870
392	0.0229	2	83.417	29.674	0.0225	2	73.339	76.293	0.0225	2	462.715	55.388	0.0225	2	165.300	98.005	0.0229	2	92.963	28.656
729	0.0338	3	3.398	2.102	0.0338	3	23.722	12.954	0.0341	3	13.044	2.954	0.0338	3	20.597	10.873	0.0345	3	21.267	8.882
730	0.0334	3	66.456	55.464	0.0338	3	27.264	5.665	0.0334	3	16.433	3.745	0.0345	3	24.237	12.193	0.0345	3	43.188	29.351
731	0.0334	3	2.002	1.506	0.0341	3	5.244	2.400	0.0334	3	5.861	7.211	0.0345	3	11.131	11.131	0.0345	3	12.921	8.486
732	0.0454	4	2.393	2.786	0.0454	4	3.022	2.324	0.0450	4	9.399	5.783	0.0454	4	20.145	14.299	0.0465	4	18.716	4.826
733	0.0454	4	6.622	8.721	0.0454	4	9.322	10.885	0.0450	4	25.366	26.819	0.0458	4	48.449	47.653	0.0454	4	22.976	35.302
734	0.0225	2	8.413	1.874	0.0233	2	20.968	0.803	0.0221	2	51.715	2.849	0.0225	2	52.870	32.286	0.0225	2	57.250	48.154
741	0.0218	2	7.707	9.880	0.0218	2	5.764	2.452	0.0221	2	26.100	18.526	0.0225	2	9.559	5.316	0.0236	2	26.240	14.199
742	0.0225	2	14.545	14.221	0.0206	2	6.851	3.796	0.0218	2	4.829	4.554	0.0221	2	39.490	39.330	0.0233	2	8.550	3.323
743	0.0221	2	18.488	1.660	0.0206	2	5.421	7.609	0.0218	2	23.750	18.314	0.0221	2	14.015	16.567	0.0233	2	12.869	6.178
744	0.0221	2	6.254	3.743	0.0221	2	8.725	9.086	0.0221	2	27.217	13.266	0.0225	2	9.081	3.064	0.0225	2	3.869	1.951
745	0.0446	4	2.802	4.240	0.0570	5	1.932	1.671	0.0559	5	7.092	4.649	0.0578	5	14.445	16.588	0.0578	5	14.563	7.820
746	0.0566	5	8.981	7.193	0.0675	6	14.447	14.048	0.0675	6	19.411	13.114	0.0683	6	18.434	11.243	0.0686	6	16.779	6.548
747	0.0893	8	22.273	17.958	0.1121	10	19.457	7.563	0.1125	10	22.433	9.574	0.1125	10	20.426	14.337	0.1028	9	35.466	21.325
748	0.0221	2	25.955	33.074	0.0225	2	106.350	134.562	0.0225	2	50.520	62.607	0.0229	2	72.050	46.457	0.0233	2	105.925	34.189
749	0.0221	2	27.713	30.670	0.0221	2	9.800	8.061	0.0225	2	16.950	0.495	0.0225	2	15.900	4.384	0.0225	2	56.302	40.590
750	0.0668	6	9.292	4.047	0.0885	8	18.823	14.451	0.0896	8	6.988	4.947	0.0904	8	10.760	11.655	0.0934	8	23.339	13.464
751	0.0334	3	14.880	6.137	0.0218	2	34.850	33.022	0.0446	4	9.238	3.941	0.0334	3	9.612	6.745	0.0341	3	56.233	55.211

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

Table 7 (cont.). Swept area, number of hauls and **roughhead grenadier** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2016																			
	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	0.0233	2	0.000	0.000																
387	0.0454	4	86.830	82.494																
388	0.0570	5	35.766	30.573																
389	0.0814	7	6.013	9.722																
390	0.1391	12	0.000	0.000																
391	0.0469	4	11.432	21.534																
392	0.0233	2	75.048	61.875																
729	0.0341	3	14.300	8.602																
730	0.0233	2	61.225	59.857																
731	0.0345	3	27.651	19.134																
732	0.0454	4	20.278	13.418																
733	0.0458	4	30.175	28.753																
734	0.0229	2	41.999	12.746																
741	0.0233	2	9.085	1.908																
742	0.0229	2	11.617	4.275																
743	0.0229	2	23.727	27.257																
744	0.0229	2	24.545	7.149																
745	0.0574	5	14.965	10.561																
746	0.0690	6	14.967	13.081																
747	0.1140	10	15.779	8.000																
748	0.0233	2	26.050	23.688																
749	0.0233	2	28.400	22.627																
750	0.0930	8	8.830	4.778																
751	0.0345	3	10.460	9.545																

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

Table 8. Stratified mean catches (Kg) of **roughhead grenadier** by stratum and year (2003-2016) 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 2006-2016.

	Survey												
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	0.00	0.00	0.00	0.00	0.00	0.00	0.00	119.18	0.00	0.00	0.00	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	8778.56	14372.48	22228.42
388	0.00	15458.10	9426.94	13445.76	5374.85	9862.70	6131.05	1792.71	5004.78	4190.04	6848.33	12571.40	12768.46
389	0.00	954.38	725.69	1565.18	9674.64	15832.37	4189.80	2397.73	6053.54	3916.39	2347.80	7476.48	3060.40
390	456.40	5.43	0.00	0.00	472.70	3787.71	872.79	2327.28	0.00	340.94	165.72	140.77	0.00
391	4.70	4.94	50230.55	24400.05	70203.05	20551.46	47806.05	43196.41	6110.94	1957.08	5266.35	33426.87	3223.68
392	565.50	29094.25	17113.63	18842.75	8435.38	8835.43	5082.25	12095.47	10634.08	67093.68	23968.50	13479.56	10881.89
729	7021.50	5482.35	4680.44	4927.20	3709.46	1858.39	2011.90	632.09	4412.23	2426.25	3830.98	3955.60	2659.80
730	17178.50	5731.55	9055.90	13834.26	5970.29	12827.07	4488.00	11297.58	4634.82	2793.67	4120.23	7341.96	10408.25
731	758.16	2257.20	2270.52	3095.93	3095.93	1075.61	2269.73	432.36	1132.78	1266.05	2404.37	2791.01	5972.54
732	7946.40	9122.19	5119.88	2575.96	4976.90	1914.82	3709.74	552.67	698.08	2171.17	4653.55	4323.40	4684.10
733	n.s	3639.48	5487.30	4470.26	5601.67	4471.16	2055.69	1549.49	2181.41	5935.70	11337.07	5376.33	7060.95
734	n.s	10075.05	6015.20	3580.20	4678.66	4402.88	10040.63	1287.19	3208.03	7912.32	8089.11	8759.25	6425.85
741	870.00	105.53	1755.70	465.00	1035.90	1133.40	1435.00	770.65	576.35	2610.00	955.90	2624.00	908.50
742	1561.60	300.80	1339.68	927.55	1079.10	219.20	247.68	930.85	438.46	309.02	2527.33	547.20	743.49
743	n.s	1338.50	539.27	1512.97	1300.93	677.18	1577.79	942.89	276.45	1211.25	714.74	656.29	1210.05
744	n.s	168.30	1014.09	2241.69	3872.22	541.70	879.05	412.73	575.85	1796.29	599.31	255.32	1619.97
745	6106.24	2018.40	2866.88	1261.09	4970.83	1317.95	2769.59	975.10	672.20	2468.16	5026.86	5068.06	5207.82
746	25009.60	10272.36	16372.53	13565.94	12042.24	9201.61	5107.56	3520.47	5663.35	7609.05	7226.19	6577.37	5867.00
747	n.s	31585.71	30630.47	45257.17	20791.04	24022.61	26632.56	16125.29	14086.51	16241.27	14788.28	25677.71	11423.78
748	8900.82	3579.89	10799.28	5331.80	34557.06	14680.47	8005.65	4126.85	16909.65	8032.68	11455.95	16842.08	4141.95
749	18295.20	5783.40	3267.18	3616.20	5978.95	1726.20	2580.67	3491.84	1234.80	2135.70	2003.40	7093.99	3578.40
750	n.s	31553.00	9377.25	10850.99	6636.90	9393.86	7096.23	5166.44	10465.52	3885.26	5982.56	12976.62	4909.48
751	n.s	n.s	973.82	5597.91	2069.59	20196.12	5072.35	3407.52	7980.65	2115.39	2201.22	12877.43	2395.34
TOTAL	94674.62	183887.34	197968.44	193139.30	221730.20	176221.39	153747.96	120444.46	107049.61	160715.33	135292.31	205211.18	131380.12
$(\overline{y})$	21.16	29.38	30.52	29.77	34.18	27.17	23.70	18.57	16.50	24.77	20.86	31.63	20.25
SD	3.38	5.27	7.41	4.86	6.12	4.97	1.71	2.51	2.92	1.75	2.44	3.31	2.61

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 2006-2016.

					Survey								
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	0	0	0	0	0	0	0	10	0	0	0	0	0
387	0	1437	792	1047	478	701	322	257	364	1093	761	1257	1960
388	0	1472	832	1195	481	889	538	159	439	368	585	1096	1120
389	0	85	64	139	868	1381	369	213	531	346	202	643	263
390	41	0	0	0	41	331	77	208	0	30	15	12	0
391	0	0	4465	2169	6189	1797	4214	3777	534	174	453	2875	275
392	49	2722	1496	1675	763	772	452	1058	945	5964	2131	1179	936
729	669	496	416	438	330	163	179	56	392	213	341	344	234
730	1553	518	833	1230	555	1140	403	1016	412	251	358	638	895
731	66	194	200	275	281	95	202	39	100	114	209	243	519
732	706	869	460	229	446	170	330	49	62	193	410	372	413
733	n.s	331	484	397	520	397	183	137	192	528	991	474	617
734	n.s	995	535	318	423	405	893	114	276	715	719	779	562
741	77	10	161	41	99	102	128	71	53	236	85	222	78
742	134	25	117	82	103	21	22	83	43	28	228	47	65
743	n.s	143	48	134	128	67	140	85	27	111	65	56	106
744	n.s	17	89	206	350	52	77	37	52	162	53	23	142
745	537	190	251	112	448	118	246	87	59	221	435	439	454
746	2242	913	1455	1226	1133	827	451	311	503	676	635	575	510
747	n.s	3082	2739	4023	1945	2150	2367	1445	1256	1444	1315	2249	1002
748	818	360	993	474	3178	1284	712	373	1503	714	1002	1449	356
749	1654	523	286	321	559	153	226	316	112	190	178	631	308
750	n.s	3506	840	959	629	831	631	464	946	347	530	1112	422
751	n.s	n.s	86	498	201	1795	451	306	734	190	198	1132	208
TOTAL	8546	17887	17641	17190	20148	15641	13612	10672	9535	14308	11898	17846	11446
SD	1340	3240	4271	2799	3534	2844	972	1466	1676	1010	1393	1864	1495

Table10.- **Roughhead grenadier** length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2016 (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	0.02	0.00	0.02	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01
42.5	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.02	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	30.69	0.90	51.59	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.- **Roughhead grenadier** length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2016 (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
42.5																
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 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: 2006-2016 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2014				2015				2016							
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				
2.5	0.00	0.05	0.24	0.29	0.00	0.00	1.16	1.16	0.01	0.00	0.50	0.51				
3.5	0.04	0.01	1.38	1.43	0.10	0.00	3.19	3.30	0.04	0.09	1.08	1.20				
4.5	0.09	0.01	0.07	0.17	0.06	0.04	0.04	0.14	0.17	0.26	0.00	0.43				
5.5	0.56	0.51	0.01	1.08	0.67	1.14	0.02	1.83	1.39	1.94	0.00	3.32				
6.5	0.85	1.04	0.00	1.88	2.00	2.51	0.00	4.51	2.40	2.78	0.01	5.19				
7.5	0.17	0.27	0.00	0.43	0.73	0.77	0.00	1.50	0.44	0.56	0.00	0.99				
8.5	0.27	0.38	0.00	0.65	2.08	2.32	0.00	4.39	1.29	1.76	0.00	3.04				
9.5	0.46	0.36	0.00	0.81	1.38	1.64	0.00	3.02	0.96	1.21	0.00	2.17				
10.5	0.61	0.47	0.00	1.08	0.73	0.87	0.00	1.59	1.43	1.15	0.00	2.59				
11.5	0.70	0.62	0.00	1.32	0.94	1.08	0.00	2.01	1.75	2.09	0.00	3.84				
12.5	0.75	0.69	0.00	1.43	1.54	1.23	0.00	2.77	1.15	1.09	0.00	2.24				
13.5	1.33	1.03	0.00	2.36	1.57	1.29	0.00	2.86	1.82	1.65	0.00	3.46				
14.5	1.24	1.14	0.00	2.38	1.94	1.38	0.00	3.31	1.81	1.78	0.00	3.59				
15.5	1.46	1.15	0.00	2.61	2.76	2.02	0.00	4.78	2.21	1.85	0.00	4.06				
16.5	1.84	1.26	0.00	3.10	3.18	1.87	0.00	5.05	1.68	1.42	0.00	3.10				
17.5	1.49	1.74	0.00	3.23	2.76	2.25	0.00	5.01	1.60	1.59	0.00	3.19				
18.5	0.91	1.71	0.00	2.62	2.67	2.08	0.00	4.75	1.02	1.53	0.00	2.55				
19.5	0.51	1.64	0.00	2.15	1.05	2.55	0.00	3.60	0.71	1.13	0.00	1.84				
20.5	0.40	1.84	0.00	2.24	0.47	2.62	0.00	3.09	0.38	1.33	0.00	1.71				
21.5	0.19	1.76	0.00	1.95	0.17	2.34	0.00	2.51	0.19	1.27	0.00	1.46				
22.5	0.04	1.36	0.00	1.40	0.11	1.70	0.00	1.81	0.02	1.09	0.00	1.11				
23.5	0.04	1.22	0.00	1.26	0.02	1.44	0.00	1.47	0.01	0.81	0.00	0.82				
24.5	0.00	1.02	0.00	1.02	0.00	1.26	0.00	1.26	0.00	0.86	0.00	0.86				
25.5	0.00	0.67	0.00	0.67	0.00	0.80	0.00	0.80	0.00	0.66	0.00	0.66				
26.5	0.00	0.51	0.00	0.51	0.01	0.76	0.00	0.77	0.00	0.47	0.00	0.47				
27.5	0.00	0.45	0.00	0.45	0.00	0.45	0.00	0.45	0.00	0.34	0.00	0.34				
28.5	0.00	0.29	0.00	0.29	0.00	0.44	0.00	0.44	0.00	0.19	0.00	0.19				
29.5	0.00	0.21	0.00	0.21	0.00	0.34	0.00	0.34	0.00	0.12	0.00	0.12				
30.5	0.00	0.15	0.00	0.15	0.00	0.17	0.00	0.17	0.00	0.08	0.00	0.08				
31.5	0.00	0.05	0.00	0.05	0.00	0.20	0.00	0.20	0.00	0.06	0.00	0.06				
32.5	0.00	0.04	0.00	0.04	0.00	0.13	0.00	0.13	0.00	0.03	0.00	0.03				
33.5	0.00	0.04	0.00	0.04	0.00	0.09	0.00	0.09	0.00	0.00	0.00	0.00				
34.5	0.00	0.01	0.00	0.01	0.00	0.08	0.00	0.08	0.00	0.01	0.00	0.01				
35.5	0.00	0.03	0.00	0.03	0.00	0.05	0.00	0.05	0.00	0.01	0.00	0.01				
36.5	0.00	0.03	0.00	0.03	0.00	0.02	0.00	0.02	0.00	0.01	0.00	0.01				
37.5	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01	0.00	0.01				
38.5	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
39.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
40.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
41.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
42.5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01				
Total	13.94	23.75	1.70	39.39	26.93	37.94	4.41	69.28	22.47	31.23	1.60	55.30				
Nº samples:				83				82				79				
	1126	1892	154	3172	2276	3199	444	5919	1691	222	135	4046				
Nº Ind.:										0						
Sampled catch:				2043				2954				1969				
Range:				2.5-39				2.5-38				2.5-42.5				
Total catch:				2043				2954				1969				
Total valid hauls:				99				97				98				

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 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2006				2007				2008				2009				2010			
	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	0.0229	2	0.000	0.000	0.0225	2	0.041	0.027	0.0229	2	0.495	0.644	0.0225	2	0.275	0.389	0.0225	2	0.000	0.000
387	0.0225	2	113.685	116.171	0.0225	2	80.400	34.083	0.0435	4	185.125	58.384	0.0439	4	568.427	761.003	0.0458	4	278.625	163.544
388	0.0566	5	66.040	32.355	0.0563	5	162.078	100.787	0.0559	5	212.750	142.882	0.0555	5	1686.275	2522.618	0.0570	5	922.261	770.678
389	0.0795	7	46.008	84.876	0.0900	8	10.723	18.542	0.0780	7	385.331	509.833	0.0803	7	321.423	836.313	0.0795	7	3449.476	9037.325
390	0.1249	11	0.188	0.318	0.1350	12	0.173	0.473	0.1395	12	0.922	2.280	0.1373	12	0.086	0.182	0.1249	11	0.005	0.011
391	0.0450	4	7.135	5.793	0.0450	4	6.013	6.351	0.0454	4	1093.130	1444.102	0.0458	4	243.571	371.869	0.0454	4	2337.331	4421.647
392	0.0229	2	4367.190	5741.976	0.0225	2	959.650	350.230	0.0221	2	209.150	15.203	0.0229	2	797.546	42.491	0.0225	2	480.100	211.425
729	0.0338	3	202.167	262.943	0.0338	3	128.889	184.792	0.0338	3	618.467	508.067	0.0341	3	50.830	11.765	0.0338	3	284.767	335.507
730	0.0326	3	145.923	148.390	0.0225	2	367.737	518.964	0.0323	3	29.790	42.861	0.0338	3	167.600	193.999	0.0334	3	147.447	167.733
731	0.0341	3	19.053	7.921	0.0338	3	37.100	28.646	0.0330	3	132.967	154.885	0.0341	3	37.000	30.152	0.0338	3	89.033	43.263
732	0.0334	3	5.638	7.067	0.0338	3	12.115	13.539	0.0446	4	11.975	11.596	0.0450	4	8.311	9.503	0.0450	4	16.665	14.441
733	0.0454	4	72.600	47.167	0.0338	3	115.667	70.383	0.0431	4	132.600	203.165	0.0450	4	59.725	53.776	0.0450	4	174.368	45.484
734	0.0225	2	12.328	3.921	0.0225	2	24.728	28.585	0.0221	2	22.485	27.457	0.0218	2	16.220	17.367	0.0225	2	5.945	3.868
741	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.555	0.049	0.0221	2	0.903	0.012	0.0225	2	0.000	0.000
742	0.0229	2	0.000	0.000	0.0225	2	0.300	0.424	0.0210	2	0.000	0.000	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000
743	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000	0.0203	2	5.575	7.884	0.0225	2	0.000	0.000
744	0.0229	2	0.000	0.000	0.0218	2	0.479	0.677	0.0221	2	0.000	0.000	0.0210	2	0.000	0.000	0.0229	2	0.133	0.188
745	0.0686	6	0.119	0.221	0.0675	6	0.380	0.450	0.0555	5	0.364	0.664	0.0559	5	0.000	0.000	0.0563	5	0.436	0.632
746	0.0675	6	0.118	0.185	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000	0.0668	6	0.043	0.106	0.0679	6	0.053	0.131
747	0.1230	11	0.000	0.000	0.1238	11	0.000	0.000	0.1069	10	0.012	0.039	0.1118	10	0.000	0.000	0.1125	10	0.000	0.000
748	0.0326	3	0.130	0.225	0.0338	3	0.830	1.050	0.0218	2	4.290	6.067	0.0229	2	1.576	2.228	0.0225	2	0.000	0.000
749	0.0229	2	0.000	0.000	0.0113	1	0.000	-	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000
750	0.1005	9	0.000	0.000	0.0679	6	0.000	0.000	0.0844	8	0.000	0.000	0.0791	7	0.230	0.609	0.0900	8	0.184	0.520
751	0.0454	4	0.000	0.000	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000	0.0338	3	0.000	0.000	0.0225	2	0.000	0.000

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

Table11 (cont.). Swept area, number of hauls and **redfish** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2011				2012				2013				2014				2015			
	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	0.0229	2	0.205	0.290	0.0225	2	0.000	0.000	0.0229	2	0.114	0.161	0.0225	2	0.000	0.000	0.0236	2	0.363	0.148
387	0.0450	4	471.900	592.192	0.0450	4	456.188	146.956	0.0450	4	903.875	221.080	0.0461	4	692.755	574.493	0.0458	4	734.010	488.907
388	0.0563	5	400.680	561.867	0.0570	5	3649.824	2735.118	0.0570	5	2614.156	2779.770	0.0585	5	2063.600	2163.327	0.0574	5	876.100	163.716
389	0.0675	6	314.072	337.845	0.0799	7	5366.450	13039.715	0.0791	7	1522.331	2830.529	0.0814	7	672.973	1713.444	0.0814	7	695.546	1727.062
390	0.1009	9	0.298	0.893	0.1354	12	0.307	0.723	0.1358	12	0.250	0.567	0.1369	12	0.096	0.316	0.1260	11	0.571	0.983
391	0.0458	4	270.078	524.098	0.0458	4	1317.264	848.814	0.0450	4	9.546	9.721	0.0465	4	39.913	51.137	0.0465	4	300.301	338.624
392	0.0229	2	7489.781	7767.171	0.0225	2	4138.815	2411.128	0.0225	2	1336.512	1473.062	0.0225	2	2692.510	923.665	0.0229	2	1394.767	444.016
729	0.0338	3	1405.563	2154.649	0.0338	3	1491.733	2440.054	0.0341	3	1933.319	1952.744	0.0338	3	1061.297	884.322	0.0345	3	227.700	84.668
730	0.0334	3	98.992	73.752	0.0338	3	214.100	203.592	0.0334	3	143.300	121.829	0.0345	3	92.793	111.735	0.0345	3	240.005	135.477
731	0.0334	3	45.227	32.987	0.0341	3	37.000	4.590	0.0334	3	82.897	60.702	0.0345	3	110.933	80.154	0.0345	3	496.350	769.247
732	0.0454	4	12.480	9.605	0.0454	4	7.236	4.921	0.0450	4	5.558	2.888	0.0454	4	39.853	27.312	0.0465	4	11.650	14.470
733	0.0454	4	255.160	236.623	0.0454	4	129.800	140.677	0.0450	4	418.230	374.577	0.0458	4	2467.588	3626.885	0.0454	4	647.925	622.329
734	0.0225	2	7.888	0.972	0.0233	2	9.015	1.393	0.0221	2	168.600	170.554	0.0225	2	42.250	1.909	0.0225	2	75.550	87.328
741	0.0218	2	0.500	0.707	0.0218	2	0.700	0.990	0.0221	2	2.003	2.833	0.0225	2	0.360	0.509	0.0236	2	1.387	1.962
742	0.0225	2	0.208	0.294	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0233	2	0.449	0.635
743	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0233	2	0.000	0.000
744	0.0221	2	0.858	1.213	0.0221	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
745	0.0446	4	0.745	1.007	0.0570	5	0.348	0.506	0.0559	5	0.490	0.565	0.0578	5	1.204	1.597	0.0578	5	0.281	0.628
746	0.0566	5	0.000	0.000	0.0675	6	0.000	0.000	0.0675	6	0.000	0.000	0.0683	6	0.009	0.022	0.0686	6	0.301	0.737
747	0.0893	8	0.379	1.071	0.1121	10	0.000	0.000	0.1125	10	0.000	0.000	0.1125	10	0.000	0.000	0.1028	9	0.022	0.065
748	0.0221	2	0.595	0.134	0.0225	2	0.000	0.000	0.0225	2	7.045	8.846	0.0229	2	0.000	0.000	0.0233	2	3.075	4.349
749	0.0221	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.192	0.096	0.0225	2	0.000	0.000
750	0.0668	6	0.242	0.592	0.0885	8	0.039	0.110	0.0896	8	0.000	0.000	0.0904	8	0.000	0.000	0.0934	8	0.148	0.340
751	0.0334	3	0.000	0.000	0.0218	2	0.000	0.000	0.0446	4	0.000	0.000	0.0334	3	0.000	0.000	0.0341	3	0.277	0.479

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

Table 11 (cont.). Swept area, number of hauls and **redfish** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2016															
	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	0.0233	2	0.000	0.000																
387	0.0454	4	584.341	493.178																
388	0.0570	5	1030.358	1137.237																
389	0.0814	7	23.125	22.419																
390	0.1391	12	0.010	0.028																
391	0.0469	4	100.259	195.736																
392	0.0233	2	1030.905	794.922																
729	0.0341	3	275.297	95.563																
730	0.0233	2	490.900	198.131																
731	0.0345	3	749.513	1224.409																
732	0.0454	4	27.555	53.312																
733	0.0458	4	470.400	560.171																
734	0.0229	2	79.902	100.440																
741	0.0233	2	2.225	3.147																
742	0.0229	2	0.000	0.000																
743	0.0229	2	0.000	0.000																
744	0.0229	2	0.000	0.000																
745	0.0574	5	0.405	0.419																
746	0.0690	6	0.187	0.311																
747	0.1140	10	0.000	0.000																
748	0.0233	2	1.125	0.658																
749	0.0233	2	0.330	0.467																
750	0.0930	8	0.000	0.000																
751	0.0345	3	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 (2003-2016) 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 2006-2016.

	Survey												
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	0.12	0.59	0.00	4.84	58.35	32.45	0.00	24.19	0.00	13.45	0.00	42.78	0.0233
387	439.04	14336.00	29103.36	20582.40	47392.00	145517.18	71328.00	120806.40	116784.00	231392.00	177345.28	187906.56	0.0454
388	2303.84	4212.60	23576.28	57861.85	75951.75	602000.18	329247.18	143042.76	1302987.17	933253.69	736705.20	312767.70	0.0570
389	407.58	16822.45	23418.22	5458.01	196133.55	163604.53	1755783.21	159862.48	2731523.05	774866.41	342543.18	354032.77	0.0814
390	472.70	0.00	153.59	141.00	751.23	70.36	3.93	242.69	250.00	203.95	78.10	465.14	0.1391
391	24.44	404.67	2012.07	1695.53	308262.66	68687.02	659127.27	76161.86	371468.38	2691.97	11255.33	84684.81	0.0469
392	6713.50	177236.40	633242.55	139149.25	30326.75	115644.17	69614.50	1086018.17	600128.18	193794.24	390413.95	202241.22	0.0233
729	16516.80	57706.50	37603.00	23973.29	115034.80	9454.32	52966.60	261434.78	277462.40	359597.27	197401.18	42352.20	0.0341
730	39283.60	9443.50	24806.97	62515.29	5064.30	28492.00	25065.93	16828.70	36397.00	24361.00	15774.87	40800.85	0.0233
731	8502.84	17182.80	4115.52	8013.60	28720.80	7992.00	19231.20	9768.96	7992.00	17905.68	23961.60	107211.60	0.0345
732	16678.20	9707.78	1302.46	2798.49	2766.23	1919.90	3849.62	2882.88	1671.40	1283.78	9205.93	2691.15	0.0454
733	n.s	26130.00	16988.40	27066.00	31028.40	13975.65	40802.00	59707.44	30373.20	97865.82	577415.48	151614.45	0.0458
734	n.s	823.65	1886.11	3783.31	3440.21	2481.66	909.59	1206.79	1379.30	25795.80	6464.25	11559.15	0.0229
741	224000.00	25.50	0.00	0.00	55.50	90.25	0.00	50.00	70.00	200.30	36.00	138.70	0.0233
742	0.00	21.18	0.00	19.20	0.00	0.00	0.00	13.31	0.00	0.00	0.00	28.74	0.0229
743	n.s	106.59	0.00	0.00	0.00	284.33	0.00	0.00	0.00	0.00	0.00	0.00	0.0229
744	n.s	0.00	0.00	31.58	0.00	0.00	8.78	56.63	0.00	0.00	0.00	0.00	0.0229
745	610078.80	0.00	41.47	132.24	126.74	0.00	151.73	259.26	121.10	170.59	418.92	97.72	0.0574
746	0.00	0.00	46.39	0.00	0.00	16.99	20.91	0.00	0.00	0.00	3.59	117.99	0.0690
747	n.s	144.80	0.00	0.00	8.98	0.00	0.00	274.22	0.00	0.00	0.00	15.69	0.1140
748	429.30	69.96	20.67	131.97	682.11	250.50	0.00	94.61	0.00	1120.16	0.00	488.93	0.0233
749	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	24.19	0.00	0.0233
750	n.s	0.00	0.00	0.00	0.00	127.88	102.17	134.37	21.68	0.00	0.00	82.22	0.0930
751	n.s	n.s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	63.36	0.0345
TOTAL	925850.76	334374.97	798317.04	353357.83	845804.35	1160641.36	3028212.59	1938870.48	5478628.86	2664516.12	2489047.05	1499403.71	1132836.20
$(\bar{y})$	206.94	53.43	123.06	54.47	130.38	178.92	466.81	298.89	844.56	410.75	383.70	231.14	174.63
SD	136.03	28.87	90.99	11.94	36.35	69.07	285.47	130.15	396.90	115.72	101.29	56.47	41.60

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 2006-2016.

	Survey												
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	0	0	0	0	5	3	0	2	0	1	0	4	0
387	38	1341	2587	1830	4358	13267	6236	10738	10381	20568	15380	16429	13187
388	207	401	2082	5143	6797	54234	28881	12715	114297	81864	62966	27256	32266
389	36	1495	2062	485	17602	14271	154597	14210	239382	68551	29466	30454	1013
390	42	0	14	13	65	6	0	22	22	18	7	41	1
391	2	37	179	151	27175	6005	58105	6659	32478	239	968	7285	2413
392	578	16584	55365	12369	2741	10111	6188	94952	53345	17226	34703	17682	12859
729	1573	5216	3342	2131	10225	831	4708	23239	24663	31613	17547	3683	4502
730	3551	854	2281	5557	471	2533	2253	1513	3235	2190	1372	3548	7179
731	743	1478	362	712	2611	703	1709	878	703	1609	2084	9323	14078
732	1483	925	117	249	248	171	342	254	147	114	812	231	561
733	n.s	2375	1498	2406	2878	1242	3627	5263	2678	8699	50484	13365	9624
734	n.s	81	168	336	311	228	81	107	119	2332	575	1027	1069
741	19911	2	0	0	5	8	0	5	6	18	3	12	19
742	0	2	0	2	0	0	0	1	0	0	0	2	0
743	n.s	11	0	0	0	28	0	0	0	0	0	0	0
744	n.s	0	0	3	0	0	1	5	0	0	0	0	0
745	53633	0	4	12	11	0	13	23	11	15	36	8	12
746	0	0	4	0	0	2	2	0	0	0	0	10	6
747	n.s	14	0	0	1	0	0	25	0	0	0	1	0
748	39	7	2	12	63	22	0	9	0	100	0	42	15
749	0	0	0	0	0	0	0	0	0	0	2	0	4
750	n.s	0	0	0	0	11	9	12	2	0	0	7	0
751	n.s	n.s	0	0	0	0	0	0	0	0	0	6	0
TOTAL	81837	30825	70066	31410	75567	103675	266754	170632	481469	235158	216405	130418	98807
SD	50717	17163	50718	6885	20435	40871	164597	72507	229026	66637	57523	31673	23025

Table14.**- Redfish** length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2016 (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
62	0.00	0.00	0.00	0.00	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:				101				99				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: 2006-2016 (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
62	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

Table14 (cont). **Redfish** length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2016 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2014				2015				2016							
Length (cm.)	M	F	I	T	M	F	I	T	M	F	I	T	M	F	I	T
4	0.00	0.00	0.38	0.38	0.00	0.00	0.18	0.18	0.00	0.00	0.01	0.01				
6	0.00	0.00	4.76	4.76	0.00	0.00	66.62	66.62	0.00	0.00	3.35	3.35				
8	0.00	0.05	6.74	6.79	0.00	0.00	31.23	31.23	0.00	0.00	72.84	72.84				
10	0.50	0.15	9.67	10.33	0.11	0.53	6.73	7.36	0.02	0.27	40.38	40.68				
12	2.37	2.20	3.86	8.42	3.45	1.38	7.14	11.97	0.36	0.28	3.63	4.27				
14	2.69	2.45	0.57	5.71	7.85	7.33	0.61	15.79	1.29	0.49	0.90	2.68				
16	7.88	4.42	0.00	12.30	5.87	6.21	0.00	12.08	1.90	1.58	0.00	3.48				
18	20.55	13.12	0.00	33.67	9.82	9.49	0.00	19.31	3.41	2.39	0.00	5.80				
20	64.32	49.96	0.00	114.27	44.36	26.09	0.00	70.45	13.32	7.22	0.00	20.54				
22	200.92	140.84	0.00	341.76	130.55	68.48	0.00	199.03	44.67	25.52	0.00	70.19				
24	173.58	217.21	0.00	390.78	116.13	122.70	0.00	238.83	68.77	46.42	0.00	115.19				
26	127.00	173.62	0.00	300.62	64.97	85.12	0.00	150.09	56.76	55.41	0.00	112.16				
28	68.06	94.45	0.00	162.51	35.75	54.34	0.00	90.09	40.07	39.89	0.00	79.96				
30	27.14	57.35	0.00	84.49	10.82	36.53	0.00	47.36	16.14	25.11	0.00	41.25				
32	8.34	32.35	0.00	40.68	6.52	23.12	0.00	29.64	7.06	25.13	0.00	32.19				
34	5.01	12.67	0.00	17.68	3.37	15.38	0.00	18.75	6.14	20.22	0.00	26.36				
36	4.13	4.05	0.00	8.18	1.69	7.33	0.00	9.01	6.97	15.74	0.00	22.72				
38	2.02	1.93	0.00	3.95	0.43	2.55	0.00	2.98	2.08	6.36	0.00	8.44				
40	0.13	0.37	0.00	0.50	0.03	0.09	0.00	0.12	1.18	1.32	0.00	2.50				
42	0.01	0.10	0.00	0.11	0.00	0.01	0.00	0.01	0.09	0.78	0.00	0.87				
44	0.00	0.08	0.00	0.08	0.00	0.05	0.00	0.05	0.00	0.65	0.00	0.65				
46	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.35	0.00	0.35				
48	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.01	0.37	0.00	0.38				
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				
52	0.00	0.01	0.00	0.01	0.00	0.03	0.00	0.03	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				
56	0.01	0.00	0.00	0.01	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	0.01	0.00	0.01	0.00	0.00	0.00	0.00				
60	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00				
62	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	717.47	810.54	26.08	1554.09	441.75	466.78	112.50	1021.03	270.24	275.49	121.11	666.84				
Nº samples:				50				56				47				
Nº Ind.:	3205	3251	1162	7618	3604	3365	1350	8319	2748	2623	1117	6488				
Sampled catch:				37262				21880				16332				
Range:				5-56				5-62				5-49				
Total catch:				37262				21880				16332				
Total valid hauls:				99				97				98				

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 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2006				2007				2008				2009				2010			
	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	0.0229	2	6.044	4.588	0.0225	2	30.260	11.653	0.0229	2	37.608	26.315	0.0225	2	22.855	12.155	0.0225	2	4.230	5.204
387	0.0225	2	16.438	16.599	0.0225	2	32.485	2.143	0.0435	4	26.276	17.380	0.0439	4	20.590	15.584	0.0458	4	22.350	21.258
388	0.0566	5	44.186	24.414	0.0563	5	31.096	13.246	0.0559	5	37.148	12.932	0.0555	5	33.480	11.888	0.0570	5	34.932	33.326
389	0.0795	7	32.979	14.712	0.0900	8	25.861	11.704	0.0780	7	33.065	8.029	0.0803	7	12.954	7.076	0.0795	7	27.170	24.762
390	0.1249	11	5.529	7.479	0.1350	12	7.366	7.441	0.1395	12	5.044	7.191	0.1373	12	14.043	24.187	0.1249	11	12.900	8.972
391	0.0450	4	151.088	51.460	0.0450	4	100.658	56.818	0.0454	4	190.795	35.749	0.0458	4	31.899	30.002	0.0454	4	24.041	14.994
392	0.0229	2	149.500	165.604	0.0225	2	330.100	170.554	0.0221	2	159.247	95.534	0.0229	2	41.322	31.215	0.0225	2	36.728	7.462
729	0.0338	3	49.261	27.663	0.0338	3	164.760	243.624	0.0338	3	34.265	25.540	0.0341	3	38.090	23.526	0.0338	3	6.453	5.814
730	0.0326	3	4.348	7.532	0.0225	2	0.000	0.000	0.0323	3	0.000	0.000	0.0338	3	0.000	0.000	0.0334	3	0.012	0.021
731	0.0341	3	46.757	62.791	0.0338	3	57.448	64.552	0.0330	3	9.140	13.870	0.0341	3	22.847	22.201	0.0338	3	11.114	11.389
732	0.0334	3	2.015	1.851	0.0338	3	0.000	0.000	0.0446	4	0.727	1.454	0.0450	4	7.100	11.428	0.0450	4	0.000	0.000
733	0.0454	4	14.573	8.911	0.0338	3	6.427	8.497	0.0431	4	14.693	15.502	0.0450	4	4.315	6.530	0.0450	4	5.573	4.374
734	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000
741	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000
742	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0214	2	0.000	0.000	0.0225	2	0.011	0.016
743	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000	0.0203	2	1.395	1.973	0.0225	2	0.000	0.000
744	0.0229	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0210	2	0.000	0.000	0.0229	2	0.000	0.000
745	0.0686	6	0.000	0.000	0.0675	6	0.000	0.000	0.0555	5	0.000	0.000	0.0559	5	0.000	0.000	0.0563	5	0.650	1.453
746	0.0675	6	0.000	0.000	0.0664	6	0.000	0.000	0.0638	6	0.000	0.000	0.0668	6	0.000	0.000	0.0679	6	0.000	0.000
747	0.1230	11	0.000	0.000	0.1238	11	0.000	0.000	0.1069	10	0.000	0.000	0.1118	10	0.000	0.000	0.1125	10	0.000	0.000
748	0.0326	3	0.837	1.449	0.0338	3	0.000	0.000	0.0218	2	0.000	0.000	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000
749	0.0229	2	0.000	0.000	0.0113	1	0.000	-	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000
750	0.1005	9	0.393	1.180	0.0679	6	0.000	0.000	0.0844	8	0.000	0.000	0.0791	7	0.000	0.000	0.0900	8	0.000	0.000
751	0.0454	4	0.000	0.000	0.0225	2	0.000	0.000	0.0413	4	0.000	0.000	0.0338	3	0.000	0.000	0.0225	2	0.000	0.000

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

Table 15 (cont.). Swept area, number of hauls and **thorny skate** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2011				2012				2013				2014				2015			
	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	0.0229	2	40.870	7.722	0.0225	2	38.670	8.358	0.0229	2	18.500	15.570	0.0225	2	8.912	1.912	0.0236	2	18.864	4.574
387	0.0450	4	5.241	5.174	0.0450	4	7.559	6.290	0.0450	4	23.395	7.473	0.0461	4	62.785	26.835	0.0458	4	64.881	63.854
388	0.0563	5	9.356	7.705	0.0570	5	42.734	32.557	0.0570	5	32.704	9.754	0.0585	5	70.966	52.957	0.0574	5	97.970	58.681
389	0.0675	6	11.893	10.892	0.0799	7	14.376	12.301	0.0791	7	21.343	11.010	0.0814	7	32.745	32.251	0.0814	7	23.159	12.273
390	0.1009	9	20.264	12.350	0.1354	12	18.599	15.739	0.1358	12	14.574	21.619	0.1369	12	15.477	15.734	0.1260	11	7.690	7.359
391	0.0458	4	32.718	28.277	0.0458	4	38.843	29.385	0.0450	4	37.358	37.052	0.0465	4	36.052	35.657	0.0465	4	52.499	19.346
392	0.0229	2	40.537	19.861	0.0225	2	178.990	196.916	0.0225	2	56.130	25.725	0.0225	2	53.836	58.357	0.0229	2	152.976	185.437
729	0.0338	3	4.906	5.481	0.0338	3	35.344	8.527	0.0341	3	28.835	4.548	0.0338	3	42.980	19.122	0.0345	3	22.367	16.344
730	0.0334	3	1.467	2.540	0.0338	3	3.670	6.357	0.0334	3	11.360	7.412	0.0345	3	22.237	11.856	0.0345	3	6.492	6.242
731	0.0334	3	4.470	5.812	0.0341	3	3.263	2.986	0.0334	3	14.460	9.648	0.0345	3	21.310	15.539	0.0345	3	21.632	12.445
732	0.0454	4	0.000	0.000	0.0454	4	0.000	0.000	0.0450	4	0.848	1.695	0.0454	4	1.980	3.960	0.0465	4	3.333	2.617
733	0.0454	4	2.899	3.869	0.0454	4	5.995	4.874	0.0450	4	18.918	20.706	0.0458	4	32.181	22.484	0.0454	4	6.778	7.155
734	0.0225	2	0.000	0.000	0.0233	2	0.010	0.014	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000
741	0.0218	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0236	2	0.000	0.000
742	0.0225	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0233	2	0.000	0.000
743	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0233	2	0.000	0.000
744	0.0221	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	0.0225	2	0.000	0.000
745	0.0446	4	0.000	0.000	0.0570	5	0.004	0.008	0.0559	5	0.000	0.000	0.0578	5	0.000	0.000	0.0578	5	0.000	0.000
746	0.0566	5	0.000	0.000	0.0675	6	0.000	0.000	0.0675	6	0.000	0.000	0.0683	6	0.000	0.000	0.0686	6	0.000	0.000
747	0.0893	8	0.424	1.199	0.1121	10	0.000	0.000	0.1125	10	0.000	0.000	0.1125	10	0.559	1.227	0.1028	9	0.698	2.095
748	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0229	2	1.530	2.164	0.0233	2	0.000	0.000
749	0.0221	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	0.0225	2	0.000	0.000
750	0.0668	6	0.000	0.000	0.0885	8	0.000	0.000	0.0896	8	0.493	1.393	0.0904	8	0.000	0.000	0.0934	8	0.000	0.000
751	0.0334	3	0.000	0.000	0.0218	2	0.000	0.000	0.0446	4	0.154	0.308	0.0334	3	0.000	0.000	0.0341	3	0.000	0.000

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

Table 15 (cont). Swept area, number of hauls and **thorny skate** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2016																			
	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	0.0233	2	7.597	5.256																
387	0.0454	4	31.627	17.162																
388	0.0570	5	79.224	106.746																
389	0.0814	7	25.022	12.652																
390	0.1391	12	14.868	9.489																
391	0.0469	4	31.228	22.199																
392	0.0233	2	105.050	119.713																
729	0.0341	3	47.022	17.543																
730	0.0233	2	11.495	1.195																
731	0.0345	3	20.199	19.892																
732	0.0454	4	8.855	12.448																
733	0.0458	4	20.013	31.029																
734	0.0229	2	2.110	2.984																
741	0.0233	2	0.000	0.000																
742	0.0229	2	0.000	0.000																
743	0.0229	2	0.000	0.000																
744	0.0229	2	0.000	0.000																
745	0.0574	5	1.514	2.088																
746	0.0690	6	0.000	0.000																
747	0.1140	10	0.000	0.000																
748	0.0233	2	1.730	2.447																
749	0.0233	2	0.000	0.000																
750	0.0930	8	0.000	0.000																
751	0.0345	3	0.000	0.000																

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

Table 16.- Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2006-2016 for **thorny skate and black dogfish**.

	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
						$W = 0.0011\ L^{3.3758}$	283	0.9216
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

Table 16 (cont.).- Length-weight relationships in the calculation of biomass, for Division 3L (out ZEE Canada), 2006-2016 for **thorny skate and black dogfish**.

	Thorny skate				Black dogfish			
Year	Sex	L-W Equations	N	r^2	Sex	L-W Equations	N	r^2
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
2014	All	$W = 0.0066\ L^{3.1037}$	577	0.9836	All	$W = 0.0010\ L^{3.3969}$	259	0.9283
	Males	$W = 0.0077\ L^{3.0639}$	402	0.9764	Males	$W = 0.0067\ L^{2.9222}$	77	0.9222
	Females	$W = 0.0049\ L^{3.1865}$	175	0.994	Females	$W = 0.009\ L^{3.4286}$	182	0.9338
2015	All	$W = 0.0064\ L^{3.1098}$	532	0.9944	All	$W = 0.0013\ L^{3.3416}$	578	0.9544
	Males	$W = 0.0075\ L^{3.0685}$	337	0.9945	Males	$W = 0.0056\ L^{2.9683}$	178	0.959
	Females	$W = 0.0050\ L^{3.1760}$	195	0.9941	Females	$W = 0.0011\ L^{3.4038}$	400	0.9604
2016	All	$W = 0.0077\ L^{3.0629}$	496	0.9916	All	$W = 0.0015\ L^{3.3055}$	350	0.9465
	Males	$W = 0.0074\ L^{3.0722}$	289	0.9919	Males	$W = 0.0085\ L^{2.8629}$	135	0.9452
	Females	$W = 0.0077\ L^{3.0656}$	207	0.9904	Females	$W = 0.0010\ L^{3.4002}$	215	0.9557

Sex	L-W Equations	N	r^2

Table 17. Stratified mean catches (Kg) of **thorny skate** by stratum and year (2003-2016) 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 2006-2016.

	Survey												
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	0.00	831.90	713.19	3570.68	4437.69	2696.89	499.14	4822.66	4563.06	2183.00	1051.62	2225.95	896.39
387	1355.52	2739.20	4208.00	8316.16	6726.59	5271.04	5721.60	1341.76	1935.04	5989.12	16072.83	16609.41	8096.51
388	4738.58	5961.90	15774.40	11101.27	13261.69	11952.50	12470.58	3340.16	15256.04	11675.33	25334.72	34975.36	28282.97
389	3045.60	5548.10	16786.09	13163.25	16830.16	6593.66	13829.31	6053.28	7317.60	10863.51	16667.21	11788.00	12735.98
390	154.85	1627.28	4506.21	6003.36	4110.66	11444.98	10513.50	16515.07	15158.46	11878.15	12613.48	6267.28	12117.49
391	485.98	18118.50	42606.68	28385.42	53804.19	8995.45	6779.63	9226.41	10953.66	10534.89	10166.52	14804.72	8806.23
392	1457.25	9033.50	21677.50	47864.50	23090.82	5991.69	5325.49	5877.79	25953.48	8138.85	7806.15	22181.52	15232.25
729	10221.63	26109.75	9162.48	30645.36	6373.35	7084.74	1200.20	912.52	6573.92	5363.25	7994.28	4160.32	8746.03
730	12138.00	0.00	739.22	0.00	0.00	0.00	2.04	249.33	623.90	1931.20	3780.23	1103.58	1954.15
731	8360.28	3998.16	10099.44	12408.84	1974.24	4934.88	2400.70	965.52	704.74	3123.36	4602.96	4672.51	4362.98
732	17602.20	0.00	465.47	0.00	167.94	1640.10	0.00	0.00	0.00	195.77	457.38	769.98	2045.51
733	n.s	2191.02	3410.14	1503.84	3438.05	1009.71	1304.02	678.31	1402.83	4426.70	7530.41	1585.94	4682.98
734	n.s	0.00	0.00	0.00	0.00	0.00	0.00	0.00	1.53	0.00	0.00	0.00	322.83
741	0.00	0.00	0.00	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	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	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	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	0.00	0.00	526.87
746	908.46	0.00	0.00	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	306.80	0.00	0.00	404.72	505.67	0.00
748	10369.98	0.00	133.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	243.27	0.00	275.07
749	1015.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
750	n.s	764.50	218.69	0.00	0.00	0.00	0.00	0.00	0.00	273.83	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	35.21	0.00	0.00	0.00
TOTAL	79536.57	76923.81	130500.54	162962.67	134215.36	67686.78	60273.11	50289.61	90445.57	76612.16	114725.78	121650.25	109084.23
$(\bar{y})$	17.78	12.29	20.12	25.12	20.69	10.43	9.29	7.75	13.94	11.81	17.69	18.75	16.82
SD	2.41	4.54	3.27	5.19	1.92	1.44	1.30	0.98	3.36	1.36	2.25	3.58	3.42

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 2006-2016.

					Survey								
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	0	73	62	317	388	240	44	422	406	191	93	188	77
387	119	256	374	739	619	481	500	119	172	532	1394	1452	714
388	426	568	1393	987	1187	1077	1094	297	1338	1024	2165	3048	2481
389	268	493	1478	1170	1510	575	1218	538	641	961	1434	1014	1096
390	14	142	397	534	354	1001	926	1473	1344	1050	1106	547	1045
391	43	1666	3787	2523	4743	786	598	807	958	936	875	1274	751
392	125	845	1895	4255	2087	524	473	514	2307	723	694	1939	1310
729	973	2360	814	2724	567	623	107	81	584	471	711	362	769
730	1097	0	68	0	0	0	0	22	55	174	329	96	168
731	731	344	888	1103	179	434	213	87	62	281	400	406	379
732	1565	0	42	0	15	146	0	0	0	17	40	66	180
733	n.s	199	301	134	319	90	116	60	124	393	658	140	409
734	n.s	0	0	0	0	0	0	0	0	0	0	0	28
741	0	0	0	0	0	0	0	0	0	0	0	0	0
742	0	0	0	0	0	0	0	0	0	0	0	0	0
743	n.s	0	0	0	0	7	0	0	0	0	0	0	0
744	n.s	0	0	0	0	0	0	0	0	0	0	0	0
745	675	0	0	0	0	0	20	0	0	0	0	0	46
746	81	0	0	0	0	0	0	0	0	0	0	0	0
747	n.s	0	0	0	0	0	0	28	0	0	36	44	0
748	954	0	12	0	0	0	0	0	0	0	21	0	24
749	92	0	0	0	0	0	0	0	0	0	0	0	0
750	n.s	85	20	0	0	0	0	0	0	24	0	0	0
751	n.s	n.s	0	0	0	0	0	0	0	3	0	0	0
TOTAL	7164	7031	11531	14486	11968	5982	5310	4448	7991	6783	9956	10577	9478
SD	942	2642	1887	2993	1124	808	740	560	2008	779	1263	1981	1927

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: 2006-2016 (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
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
94	0.00	0.00	0.00	0.00	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	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:				101				99				94				98

Table 19 (cont).-**Thorny skate** length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2016 (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
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
94	0.00	0.00	0.00	0.00	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	1.73	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 19 (cont.).-**Thorny skate** length distribution per haul mean catches by sex and year. Number per stratified mean catches. Spanish Summer Survey on NAFO 3L: 2006-2016 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2014				2015				2016							
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				
12	0.01	0.02	0.00	0.03	0.02	0.04	0.00	0.06	0.06	0.00	0.00	0.06				
14	0.12	0.12	0.00	0.24	0.03	0.11	0.00	0.14	0.08	0.02	0.00	0.10				
16	0.02	0.04	0.00	0.06	0.02	0.03	0.00	0.05	0.04	0.07	0.00	0.12				
18	0.06	0.01	0.00	0.07	0.03	0.11	0.00	0.14	0.08	0.08	0.00	0.16				
20	0.05	0.09	0.00	0.14	0.12	0.09	0.00	0.21	0.08	0.07	0.00	0.14				
22	0.08	0.06	0.00	0.14	0.23	0.08	0.00	0.31	0.01	0.04	0.00	0.05				
24	0.08	0.04	0.00	0.12	0.21	0.15	0.00	0.36	0.06	0.12	0.00	0.18				
26	0.10	0.09	0.00	0.19	0.30	0.28	0.00	0.58	0.15	0.11	0.00	0.25				
28	0.03	0.11	0.00	0.14	0.33	0.27	0.00	0.60	0.17	0.22	0.00	0.38				
30	0.17	0.11	0.00	0.27	0.39	0.40	0.00	0.79	0.31	0.38	0.00	0.68				
32	0.13	0.08	0.00	0.20	0.38	0.27	0.00	0.65	0.29	0.38	0.00	0.68				
34	0.07	0.06	0.00	0.12	0.27	0.24	0.00	0.51	0.34	0.37	0.00	0.71				
36	0.06	0.08	0.00	0.14	0.24	0.19	0.00	0.43	0.30	0.15	0.00	0.45				
38	0.10	0.10	0.00	0.20	0.13	0.10	0.00	0.23	0.13	0.09	0.00	0.21				
40	0.11	0.04	0.00	0.15	0.03	0.08	0.00	0.11	0.13	0.11	0.00	0.24				
42	0.12	0.04	0.00	0.17	0.13	0.10	0.00	0.23	0.10	0.14	0.00	0.25				
44	0.15	0.10	0.00	0.25	0.12	0.10	0.00	0.22	0.09	0.04	0.00	0.13				
46	0.20	0.08	0.00	0.29	0.11	0.10	0.00	0.21	0.08	0.05	0.00	0.14				
48	0.19	0.10	0.00	0.29	0.08	0.10	0.00	0.17	0.09	0.12	0.00	0.21				
50	0.14	0.03	0.00	0.17	0.14	0.21	0.00	0.34	0.15	0.07	0.00	0.23				
52	0.18	0.09	0.00	0.26	0.12	0.09	0.00	0.21	0.17	0.18	0.00	0.35				
54	0.12	0.02	0.00	0.14	0.12	0.09	0.00	0.21	0.09	0.15	0.00	0.23				
56	0.13	0.06	0.00	0.19	0.12	0.04	0.00	0.16	0.10	0.13	0.00	0.23				
58	0.06	0.04	0.00	0.11	0.05	0.10	0.00	0.16	0.05	0.08	0.00	0.13				
60	0.09	0.09	0.00	0.17	0.12	0.09	0.00	0.21	0.13	0.09	0.00	0.22				
62	0.11	0.02	0.00	0.13	0.11	0.12	0.00	0.23	0.09	0.08	0.00	0.17				
64	0.08	0.06	0.00	0.14	0.16	0.07	0.00	0.24	0.11	0.07	0.00	0.18				
66	0.24	0.19	0.00	0.42	0.19	0.18	0.00	0.37	0.16	0.08	0.00	0.24				
68	0.27	0.10	0.00	0.37	0.32	0.09	0.00	0.41	0.19	0.12	0.00	0.30				
70	0.31	0.12	0.00	0.44	0.32	0.10	0.00	0.42	0.34	0.22	0.00	0.56				
72	0.36	0.15	0.00	0.51	0.40	0.08	0.00	0.48	0.27	0.07	0.00	0.34				
74	0.31	0.07	0.00	0.39	0.31	0.04	0.00	0.35	0.14	0.11	0.00	0.25				
76	0.33	0.04	0.00	0.36	0.32	0.03	0.00	0.35	0.34	0.03	0.00	0.37				
78	0.19	0.04	0.00	0.23	0.27	0.02	0.00	0.29	0.22	0.03	0.00	0.25				
80	0.22	0.01	0.00	0.23	0.19	0.04	0.00	0.23	0.19	0.02	0.00	0.21				
82	0.13	0.00	0.00	0.13	0.03	0.00	0.00	0.03	0.07	0.00	0.00	0.07				
84	0.06	0.00	0.00	0.06	0.08	0.00	0.00	0.08	0.06	0.00	0.00	0.06				
86	0.05	0.00	0.00	0.05	0.03	0.00	0.00	0.03	0.02	0.00	0.00	0.02				
88	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01	0.01	0.00	0.00	0.01				
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				
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				
94	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01				
Total	5.23	2.51	0.00	7.74	6.59	4.24	0.00	10.83	5.50	4.08	0.00	9.58				
Nº samples:				50				49				54				
Nº Ind.:	474	217	0	691	607	390	0	997	466	331	0	797				
Sampled catch:				1695				1748				1582				
Range:				13-89				12-91				12-94				
Total catch:				1695				1748				1582				
Total valid hauls:				99				97				98				

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 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2006				2007				2008				2009				2010			
	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	0.0229	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
387	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0435	4	0.000	0.000	0.0439	4	0.000	0.000	0.0458	4	0.000	0.000
388	0.0566	5	0.000	0.000	0.0563	5	0.000	0.000	0.0559	5	0.000	0.000	0.0555	5	0.000	0.000	0.0570	5	0.000	0.000
389	0.0795	7	0.000	0.000	0.0900	8	0.000	0.000	0.0780	7	0.000	0.000	0.0803	7	0.000	0.000	0.0795	7	0.000	0.000
390	0.1249	11	0.000	0.000	0.1350	12	0.000	0.000	0.1395	12	0.000	0.000	0.1373	12	0.000	0.000	0.1249	11	0.000	0.000
391	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000	0.0454	4	0.000	0.000	0.0458	4	0.000	0.000	0.0454	4	0.000	0.000
392	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000
729	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	0.0338	3	0.000	0.000
730	0.0326	3	3.690	6.391	0.0225	2	19.488	26.067	0.0323	3	27.367	47.400	0.0338	3	30.959	51.654	0.0334	3	19.640	25.019
731	0.0341	3	0.000	0.000	0.0338	3	0.000	0.000	0.0330	3	0.000	0.000	0.0341	3	0.000	0.000	0.0338	3	0.000	0.000
732	0.0334	3	0.000	0.000	0.0338	3	0.000	0.000	0.0446	4	0.000	0.000	0.0450	4	0.000	0.000	0.0450	4	0.300	0.600
733	0.0454	4	0.000	0.000	0.0338	3	0.000	0.000	0.0431	4	0.000	0.000	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000
734	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0221	2	0.000	0.000	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000
741	0.0218	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000
742	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0210	2	0.000	0.000	0.0214	2	0.000	0.000	0.0225	2	0.000	0.000
743	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0203	2	0.000	0.000	0.0203	2	1.835	1.082	0.0225	2	0.000	0.000
744	0.0229	2	0.725	1.025	0.0218	2	1.663	0.541	0.0221	2	0.880	0.198	0.0210	2	0.430	0.608	0.0229	2	0.000	0.000
745	0.0686	6	0.000	0.000	0.0675	6	0.000	0.000	0.0555	5	0.000	0.000	0.0559	5	0.000	0.000	0.0563	5	0.000	0.000
746	0.0675	6	9.033	10.572	0.0664	6	9.171	6.742	0.0638	6	6.142	1.917	0.0668	6	3.939	5.074	0.0679	6	4.817	2.936
747	0.1230	11	3.656	2.707	0.1238	11	6.015	5.815	0.1069	10	5.894	5.184	0.1118	10	6.653	4.933	0.1125	10	5.965	5.925
748	0.0326	3	15.713	18.383	0.0338	3	35.817	40.266	0.0218	2	80.800	114.268	0.0229	2	12.240	17.310	0.0225	2	83.545	40.807
749	0.0229	2	91.125	124.599	0.0113	1	229.700	-	0.0214	2	35.410	19.827	0.0225	2	131.090	156.143	0.0229	2	148.715	196.837
750	0.1005	9	6.213	9.605	0.0679	6	13.979	28.671	0.0844	8	12.366	21.347	0.0791	7	9.146	7.225	0.0900	8	0.848	1.376
751	0.0454	4	1.103	1.497	0.0225	2	4.405	0.191	0.0413	4	3.780	2.765	0.0338	3	5.343	4.636	0.0225	2	1.870	1.414

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

Table 20 (cont.). Swept area, number of hauls and **black dogfish** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2011				2012				2013				2014				2015			
	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	0.0229	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	0.0236	2	0.000	0.000
387	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000	0.0450	4	0.000	0.000	0.0461	4	0.000	0.000	0.0458	4	0.000	0.000
388	0.0563	5	0.000	0.000	0.0570	5	0.000	0.000	0.0570	5	0.000	0.000	0.0585	5	0.000	0.000	0.0574	5	0.000	0.000
389	0.0675	6	0.000	0.000	0.0799	7	0.000	0.000	0.0791	7	0.000	0.000	0.0814	7	0.000	0.000	0.0814	7	0.000	0.000
390	0.1009	9	0.000	0.000	0.1354	12	0.000	0.000	0.1358	12	0.000	0.000	0.1369	12	0.000	0.000	0.1260	11	0.000	0.000
391	0.0458	4	0.000	0.000	0.0458	4	0.000	0.000	0.0450	4	0.000	0.000	0.0465	4	0.000	0.000	0.0465	4	0.000	0.000
392	0.0229	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0225	2	0.000	0.000	0.0229	2	0.000	0.000
729	0.0338	3	0.000	0.000	0.0338	3	0.000	0.000	0.0341	3	0.000	0.000	0.0338	3	0.000	0.000	0.0345	3	0.000	0.000
730	0.0334	3	3.646	6.315	0.0338	3	10.040	17.053	0.0334	3	0.000	0.000	0.0345	3	0.000	0.000	0.0345	3	16.964	28.977
731	0.0334	3	0.000	0.000	0.0341	3	0.000	0.000	0.0334	3	0.000	0.000	0.0345	3	0.000	0.000	0.0345	3	0.000	0.000
732	0.0454	4	0.000	0.000	0.0454	4	0.000	0.000	0.0450	4	0.000	0.000	0.0454	4	0.000	0.000	0.0465	4	0.000	0.000
733	0.0454	4	0.000	0.000	0.0454	4	0.000	0.000	0.0450	4	0.000	0.000	0.0458	4	0.000	0.000	0.0454	4	0.000	0.000
734	0.0225	2	0.000	0.000	0.0233	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
741	0.0218	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.000	0.000	0.0225	2	0.000	0.000	0.0236	2	0.000	0.000
742	0.0225	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.000	0.000	0.0221	2	0.598	0.845	0.0233	2	0.523	0.740
743	0.0221	2	0.000	0.000	0.0206	2	0.000	0.000	0.0218	2	0.945	1.336	0.0221	2	2.505	3.543	0.0233	2	5.060	2.206
744	0.0221	2	0.612	0.865	0.0221	2	0.000	0.000	0.0221	2	3.550	5.020	0.0225	2	0.000	0.000	0.0225	2	0.506	0.716
745	0.0446	4	0.705	1.410	0.0570	5	0.000	0.000	0.0559	5	0.620	1.386	0.0578	5	0.000	0.000	0.0578	5	51.731	115.643
746	0.0566	5	7.160	9.335	0.0675	6	6.004	4.804	0.0675	6	26.233	40.751	0.0683	6	10.215	14.886	0.0686	6	29.042	14.767
747	0.0893	8	5.204	3.122	0.1121	10	4.889	4.861	0.1125	10	11.874	6.025	0.1125	10	11.466	4.719	0.1028	9	7.979	7.512
748	0.0221	2	135.930	187.058	0.0225	2	25.190	35.624	0.0225	2	25.780	36.458	0.0229	2	63.850	2.758	0.0233	2	100.365	117.401
749	0.0221	2	114.000	69.141	0.0221	2	70.633	84.905	0.0225	2	42.515	34.104	0.0225	2	66.725	41.260	0.0225	2	107.620	22.316
750	0.0668	6	1.711	2.351	0.0885	8	4.283	6.729	0.0896	8	7.622	10.816	0.0904	8	12.006	13.261	0.0934	8	11.718	17.339
751	0.0334	3	3.076	2.976	0.0218	2	9.550	5.388	0.0446	4	7.797	3.881	0.0334	3	3.267	3.348	0.0341	3	15.593	0.655

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

Table 20 (cont.). Swept area, number of hauls and **black dogfish** mean catch (Kg) and SD (**) by stratum. Spanish Survey on NAFO Div. 3L in the period 2006-2016, on board R/V "*Vizconde de Eza*".

Stratum	2016															
	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	0.0233	2	0.000	0.000																
387	0.0454	4	0.000	0.000																
388	0.0570	5	0.000	0.000																
389	0.0814	7	0.000	0.000																
390	0.1391	12	0.000	0.000																
391	0.0469	4	0.000	0.000																
392	0.0233	2	0.000	0.000																
729	0.0341	3	0.000	0.000																
730	0.0233	2	40.845	2.284																
731	0.0345	3	0.000	0.000																
732	0.0454	4	0.000	0.000																
733	0.0458	4	0.000	0.000																
734	0.0229	2	0.000	0.000																
741	0.0233	2	0.465	0.658																
742	0.0229	2	0.745	1.054																
743	0.0229	2	8.170	9.150																
744	0.0229	2	2.175	3.076																
745	0.0574	5	4.588	10.259																
746	0.0690	6	7.011	4.467																
747	0.1140	10	7.782	4.872																
748	0.0233	2	5.220	7.382																
749	0.0233	2	84.700	25.173																
750	0.0930	8	10.915	9.666																
751	0.0345	3	5.014	2.285																

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

Table 21. Stratified mean catches (Kg) of **black dogfish** by stratum and year (2003-2016) 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 2006-2016.

	Survey												
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	0.00	0.00	0.00	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	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	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	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	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	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	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	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	0.00	2883.94	6943.65
731	0.00	0.00	0.00	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	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	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	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	0.00	0.00	46.50
742	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	38.24	33.47	47.68
743	n.s	31.90	0.00	0.00	0.00	93.59	0.00	0.00	0.00	48.20	127.76	258.06	416.67
744	n.s	0.00	47.85	109.73	58.08	28.38	0.00	40.39	0.00	234.30	0.00	33.40	143.55
745	2.32	0.00	0.00	0.00	0.00	0.00	0.00	245.34	0.00	215.76	0.00	18002.53	1596.62
746	0.00	0.00	3541.07	3594.84	2407.60	1544.22	1888.13	2806.72	2353.63	10283.47	4004.35	11384.59	2748.44
747	n.s	2944.27	2646.94	4354.53	4267.26	4816.77	4318.66	3767.42	3539.64	8596.56	8301.38	5776.96	5634.17
748	0.00	5879.82	2498.42	5694.85	12847.20	1946.16	13283.66	21612.87	4005.21	4099.02	10152.15	15958.04	829.98
749	27688.50	2179.80	11481.75	28942.20	4461.66	16517.34	18738.09	14364.00	8899.76	5356.89	8407.35	13560.12	10672.20
750	n.s	1556.80	3454.61	7772.42	6875.64	5085.02	471.21	951.50	2381.07	4237.97	6675.48	6514.93	6068.46
751	n.s	n.s	252.47	1008.75	865.62	1223.62	428.23	704.48	2186.95	1785.40	748.07	3570.87	1148.21
TOTAL	27690.82	12962.34	24550.42	54790.18	36435.38	36518.07	42536.08	45112.55	25073.06	34857.56	38454.77	77976.90	36293.13
$(\bar{y})$	6.19	2.07	3.78	8.45	5.62	5.63	6.56	6.95	3.87	5.37	5.93	12.02	5.6
SD	6.19	1.01	1.78	1.28	2.23	2.33	2.83	3.39	1.38	1.34	0.81	3.55	0.58

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 2006-2016.

					Survey								
Stratum	2003	2004	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
385	0	0	0	0	0	0	0	0	0	0	0	0	0
387	0	0	0	0	0	0	0	0	0	0	0	0	0
388	0	0	0	0	0	0	0	0	0	0	0	0	0
389	0	0	0	0	0	0	0	0	0	0	0	0	0
390	0	0	0	0	0	0	0	0	0	0	0	0	0
391	0	0	0	0	0	0	0	0	0	0	0	0	0
392	0	0	0	0	0	0	0	0	0	0	0	0	0
729	0	0	0	0	0	0	0	0	0	0	0	0	0
730	0	33	58	294	433	468	300	56	152	0	0	251	597
731	0	0	0	0	0	0	0	0	0	0	0	0	0
732	0	0	0	0	0	0	6	0	0	0	0	0	0
733	n.s	0	0	0	0	0	0	0	0	0	0	0	0
734	n.s	0	0	0	0	0	0	0	0	0	0	0	0
741	0	0	0	0	0	0	0	0	0	0	0	0	4
742	0	0	0	0	0	0	0	0	0	0	3	3	4
743	n.s	3	0	0	0	9	0	0	0	4	12	22	36
744	n.s	0	4	10	5	3	0	4	0	21	0	3	13
745	0	0	0	0	0	0	0	22	0	19	0	1559	139
746	0	0	315	325	227	139	167	248	209	914	352	995	239
747	n.s	287	237	387	399	431	384	338	316	764	738	506	494
748	0	592	230	506	1181	170	1181	1954	356	364	888	1373	71
749	2503	197	1004	2573	417	1468	1638	1298	804	476	747	1205	918
750	n.s	173	309	687	652	450	42	86	215	378	591	558	522
751	n.s	n.s	22	90	84	109	38	63	201	160	67	314	100
TOTAL	2503	1286	2179	487[illegible]	3399	3247	3756	4068	2253	3102	3398	6789	3138
SD	2546	695	994	72[illegible]	1296	1340	1634	1964	819	773	466	2012	324

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: 2006-2016 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2006				2008				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: 2006-2016 (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

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: 2006-2016 (R/V *Vizconde de Eza*). Indet. means indeterminate.

	2014				2015				2016							
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				
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
22	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.00				
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
32	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
34	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
36	0.00	0.01	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
38	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.01				
40	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.03	0.01	0.01	0.00	0.02				
42	0.03	0.07	0.00	0.10	0.03	0.13	0.00	0.16	0.00	0.01	0.00	0.01				
44	0.04	0.04	0.00	0.07	0.05	0.13	0.00	0.19	0.02	0.03	0.00	0.06				
46	0.04	0.12	0.00	0.15	0.23	0.29	0.00	0.53	0.11	0.12	0.00	0.23				
48	0.05	0.11	0.00	0.17	0.23	0.32	0.00	0.55	0.11	0.17	0.00	0.28				
50	0.03	0.09	0.00	0.12	0.22	0.28	0.00	0.50	0.14	0.11	0.00	0.25				
52	0.15	0.07	0.00	0.22	0.21	0.31	0.00	0.52	0.09	0.12	0.00	0.20				
54	0.09	0.10	0.00	0.19	0.16	0.30	0.00	0.46	0.11	0.16	0.00	0.27				
56	0.08	0.24	0.00	0.32	0.13	0.32	0.00	0.46	0.18	0.13	0.00	0.31				
58	0.13	0.27	0.00	0.40	0.21	0.41	0.00	0.63	0.21	0.18	0.00	0.38				
60	0.21	0.21	0.00	0.43	0.31	0.37	0.00	0.68	0.20	0.22	0.00	0.42				
62	0.28	0.34	0.00	0.62	0.42	0.61	0.00	1.02	0.21	0.21	0.00	0.41				
64	0.16	0.26	0.00	0.42	0.31	0.57	0.00	0.88	0.16	0.25	0.00	0.41				
66	0.06	0.30	0.00	0.36	0.16	0.58	0.00	0.74	0.12	0.24	0.00	0.35				
68	0.05	0.25	0.00	0.29	0.09	0.63	0.00	0.72	0.04	0.30	0.00	0.34				
70	0.01	0.17	0.00	0.18	0.02	0.60	0.00	0.63	0.01	0.24	0.00	0.25				
72	0.00	0.15	0.00	0.15	0.00	0.38	0.00	0.38	0.01	0.15	0.00	0.16				
74	0.00	0.13	0.00	0.13	0.00	0.18	0.00	0.18	0.00	0.08	0.00	0.08				
76	0.00	0.07	0.00	0.07	0.00	0.05	0.00	0.05	0.00	0.05	0.00	0.05				
78	0.00	0.05	0.00	0.05	0.00	0.04	0.00	0.04	0.00	0.02	0.00	0.02				
80	0.00	0.02	0.00	0.02	0.00	0.03	0.00	0.03	0.00	0.00	0.00	0.00				
82	0.00	0.01	0.00	0.01	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				
86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
88	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				
Total	1.41	3.08	0.00	4.50	2.81	6.56	0.00	9.37	1.73	2.80	0.00	4.53				
Nº samples:				27				35				37				
Nº Ind.:	125	282	0	407	260	594	0	854	149	267	0	416				
Sampled catch:				549				1124				530				
Range:				37-82				22-81				38-79				
Total catch:				549				1124				530				
Total valid hauls:				99				97				98				

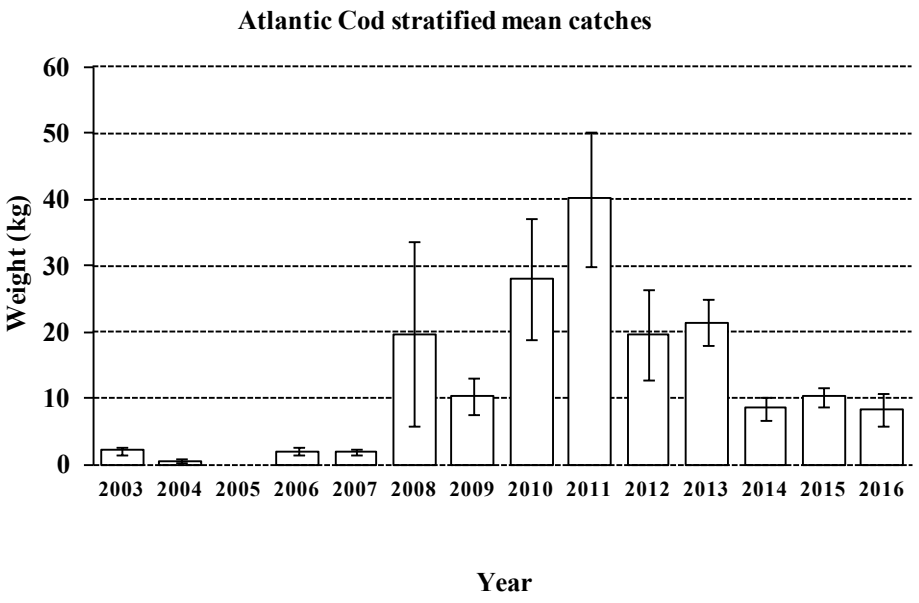


Fig. 1. **Atlantic cod** stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

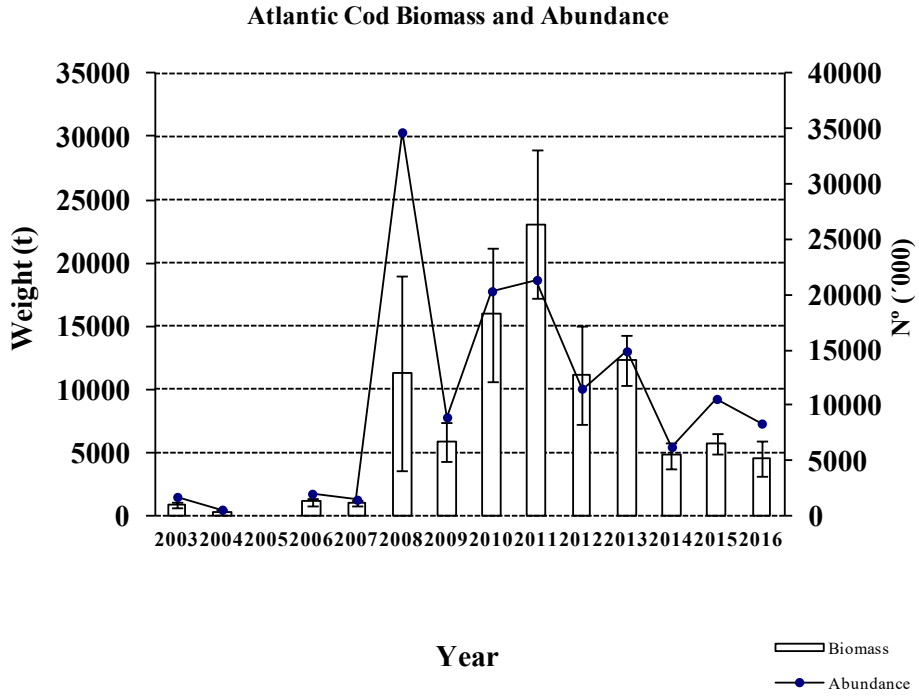


Fig. 2. **Atlantic cod** abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

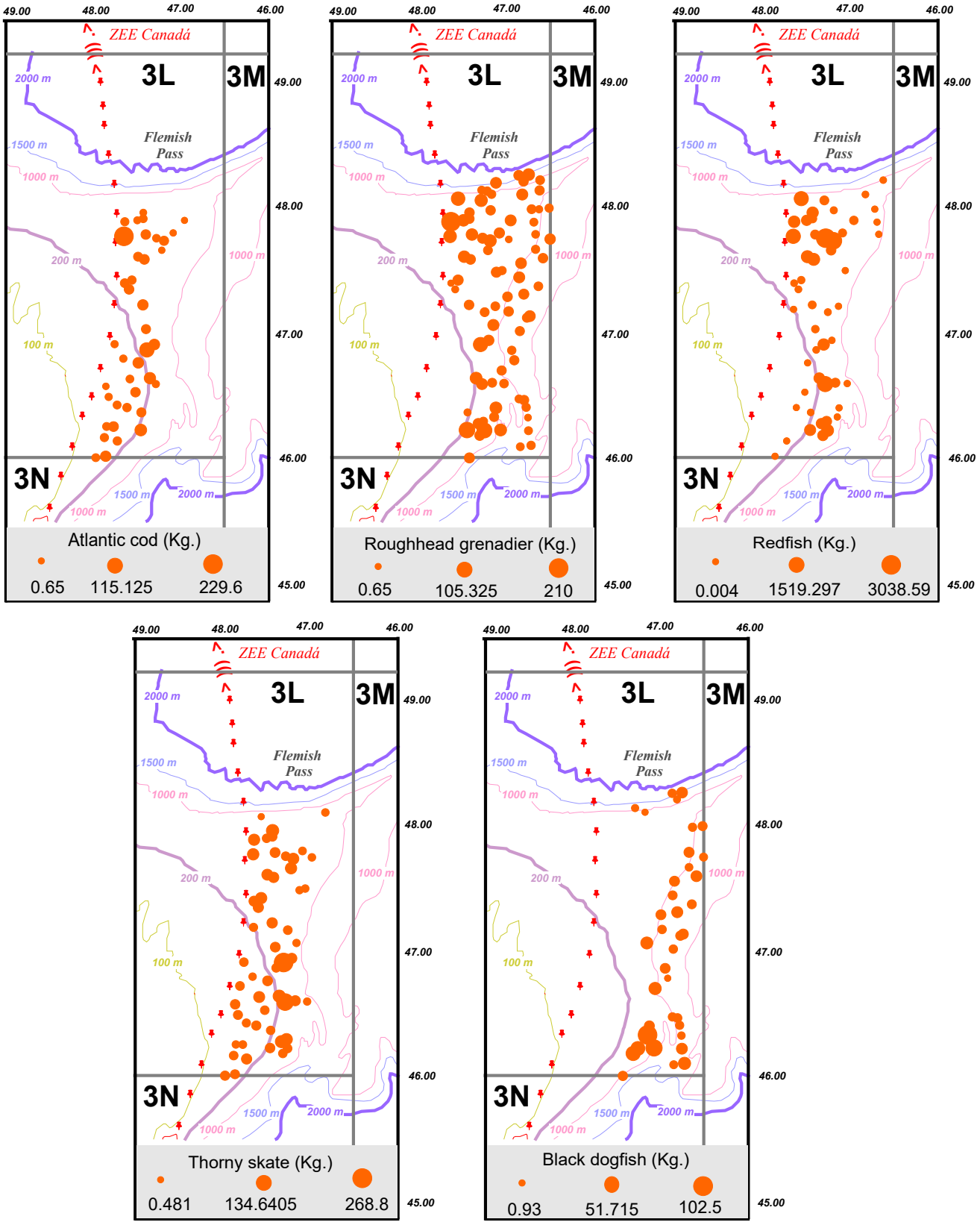


Fig. 3. Distribution of the catches per haul for **Atlantic cod, Roughhead grenadier, redfish, thorny skate and black dogfish** in 2016 Spanish 3L survey.

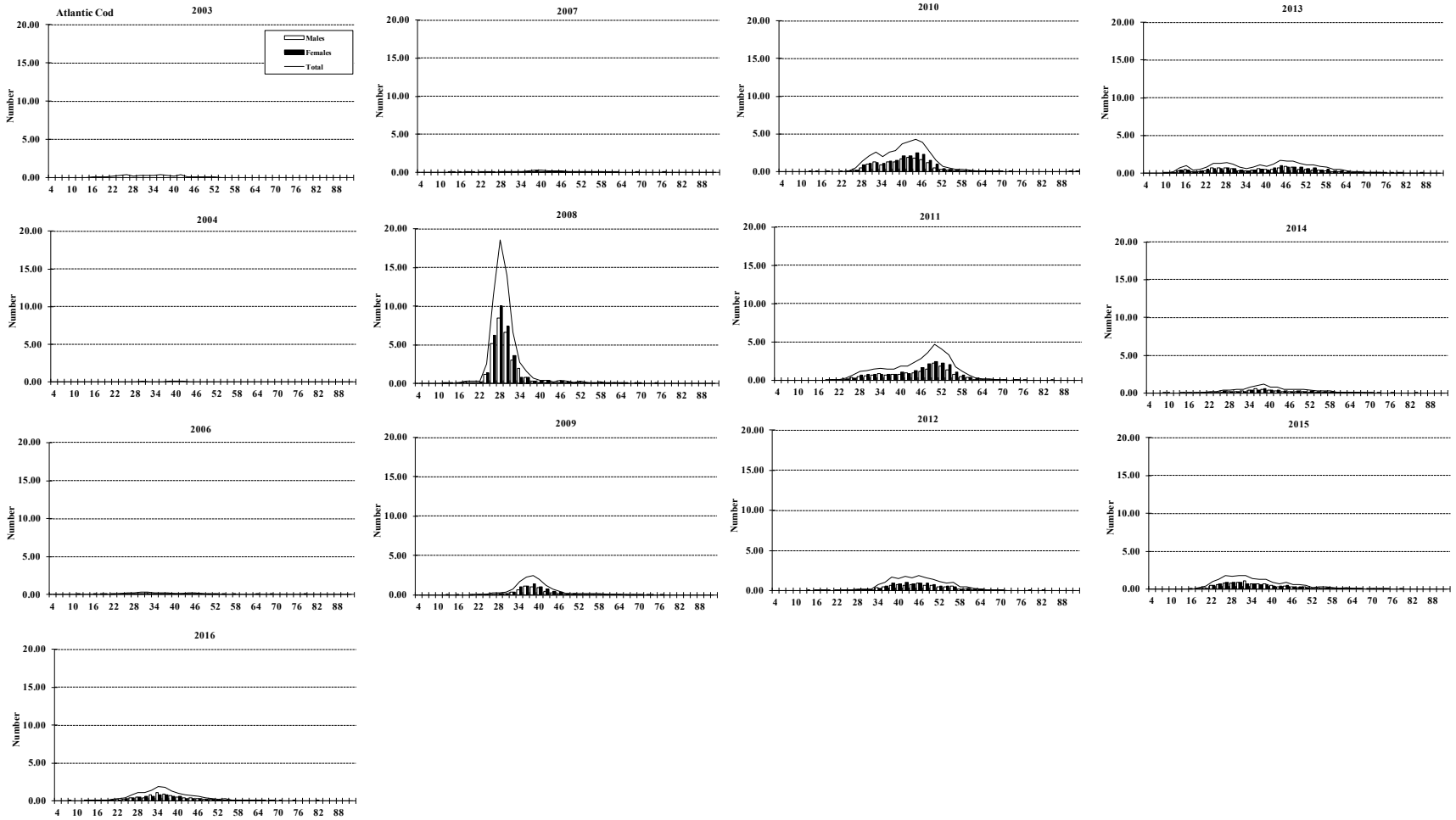
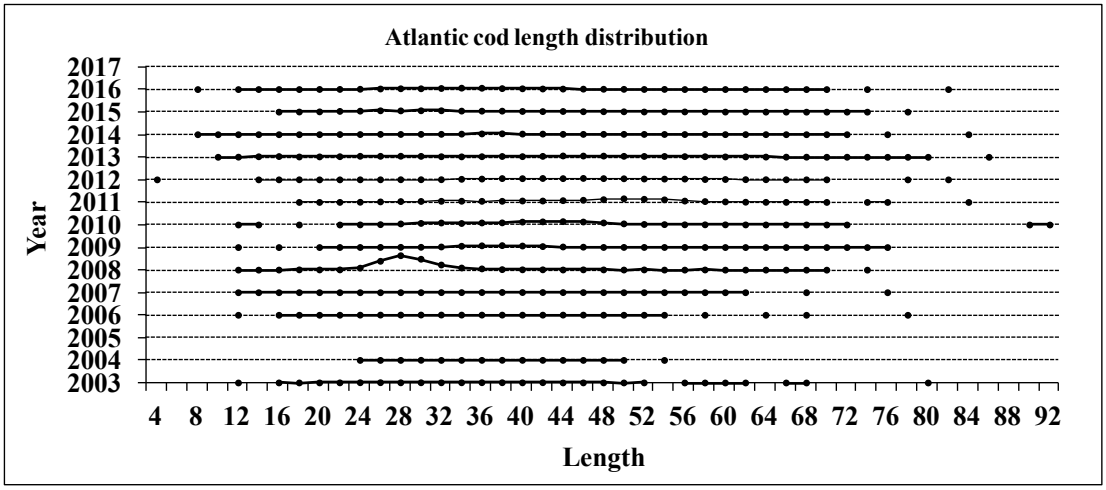
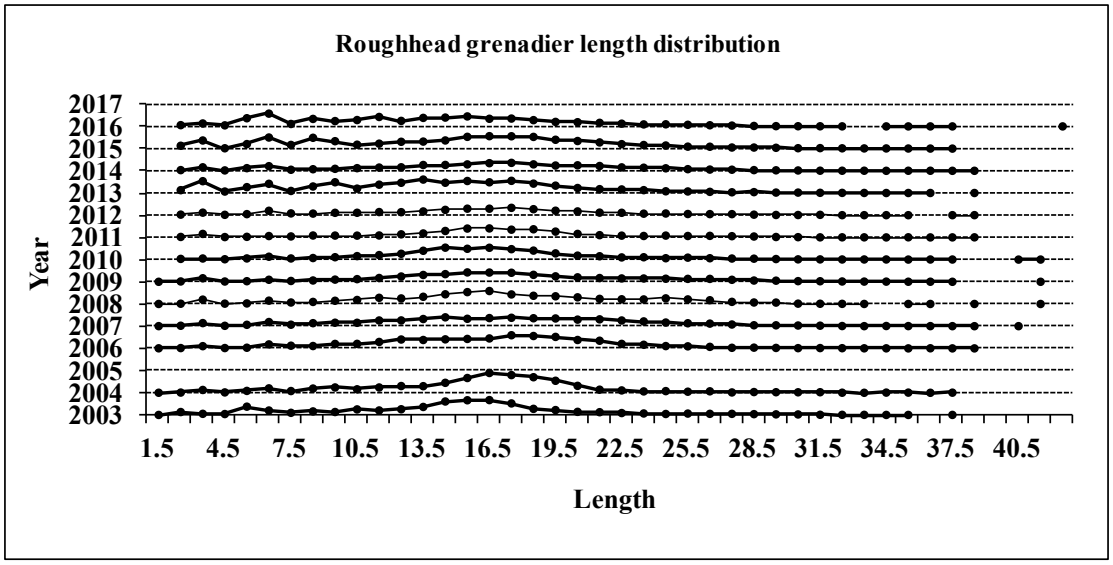


Fig. 4. **Atlantic cod** length distribution (cm) in NAFO 3L: 2003-2016. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2016.





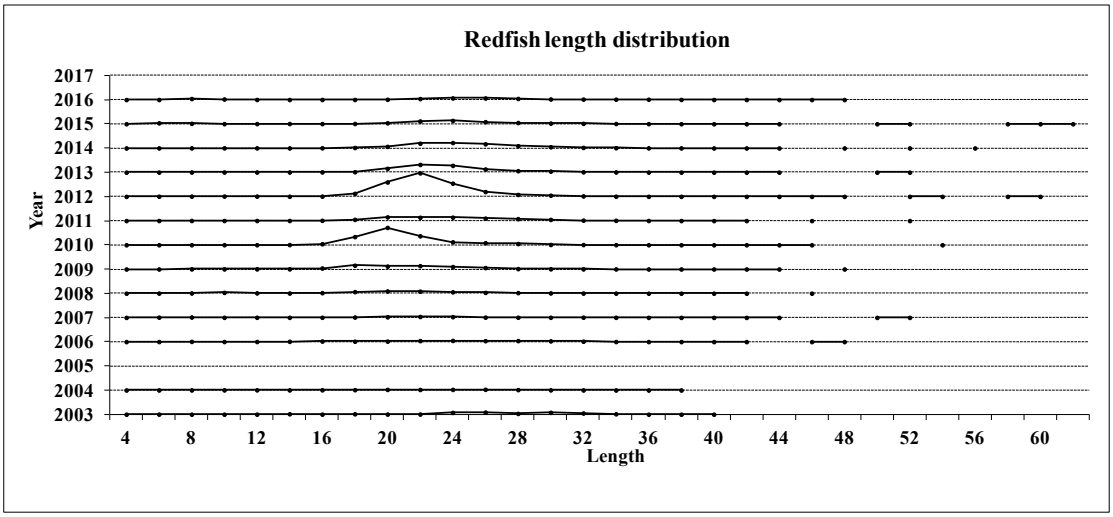


Fig. 5. **Atlantic cod, roughhead grenadier and redfish** length distribution (cm) in NAFO 3L: 2003-2016.

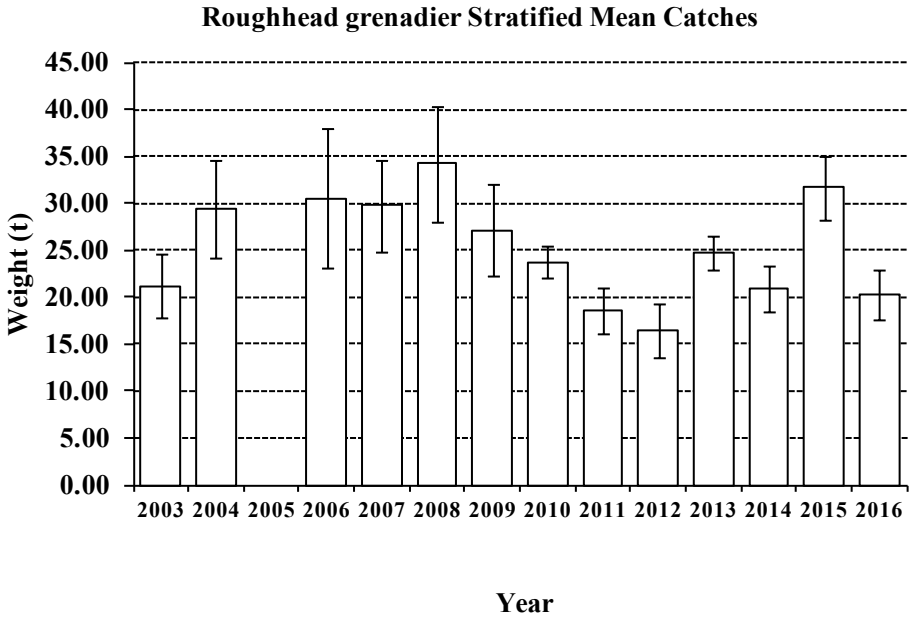


Fig. 6. **Roughhead grenadier** stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

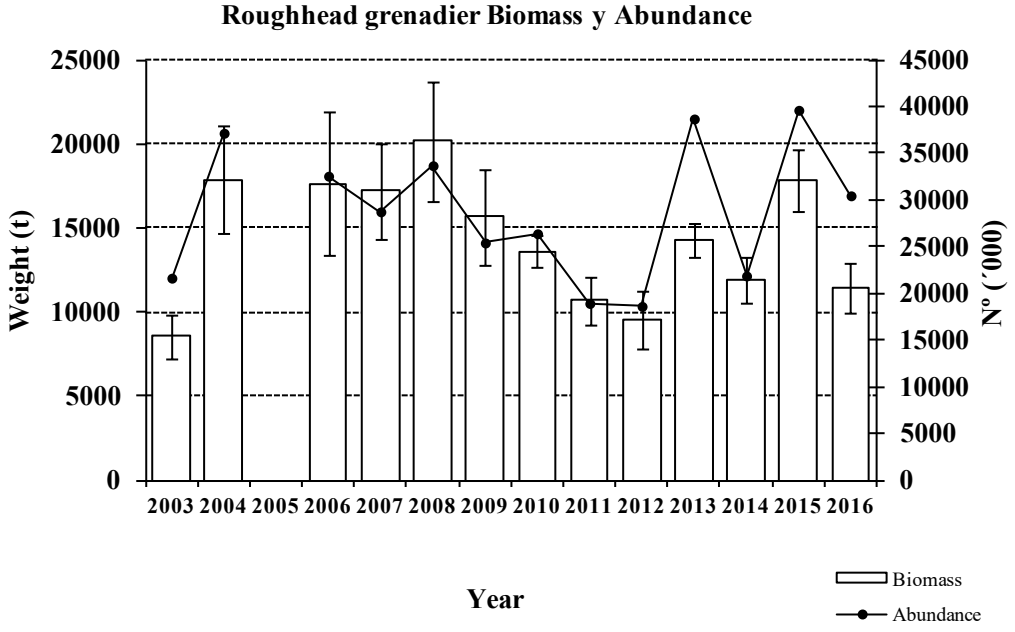


Fig. 7. **Roughhead grenadier** abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

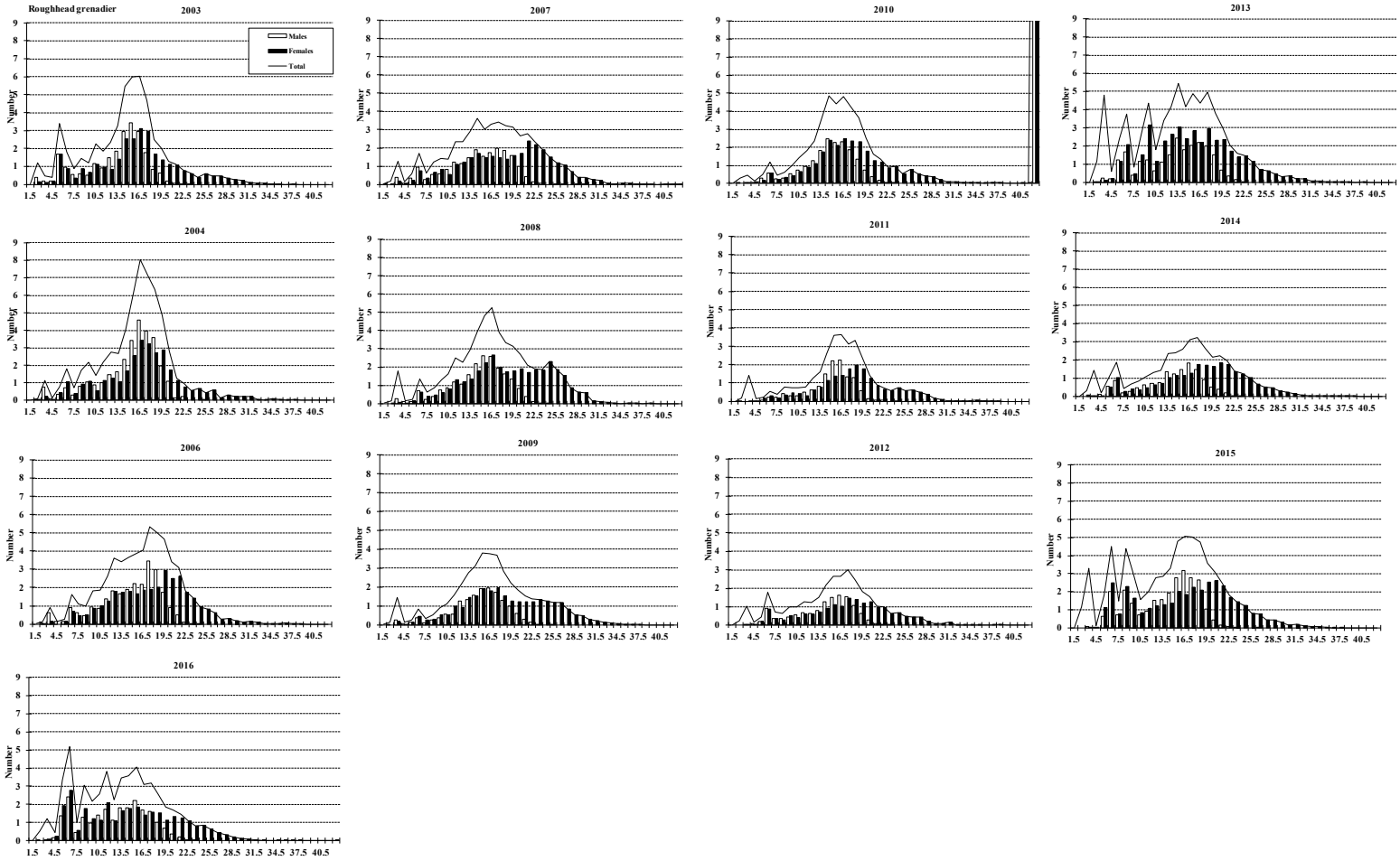


Fig. 8. **Roughhead grenadier** length distribution (cm) in NAFO 3L: 2003-2016. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

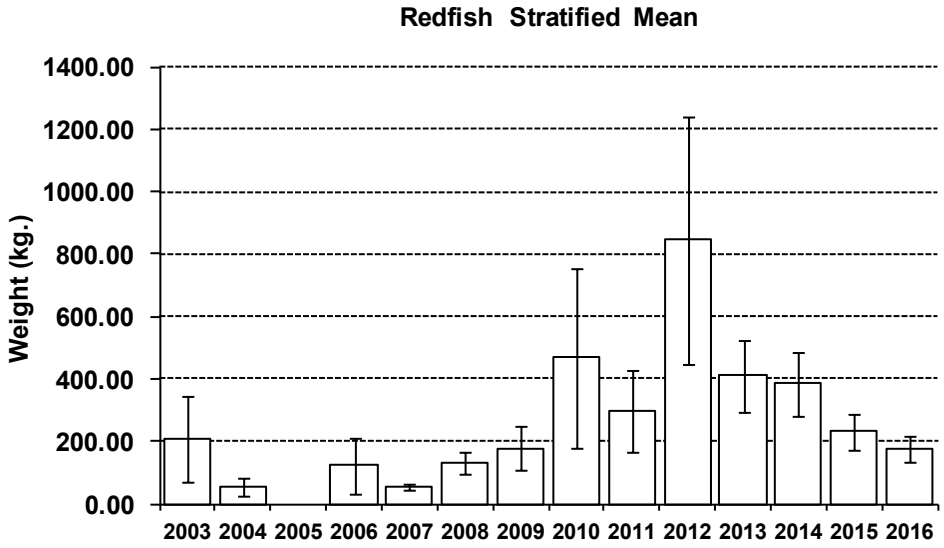


Fig. 9. **Redfish** stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

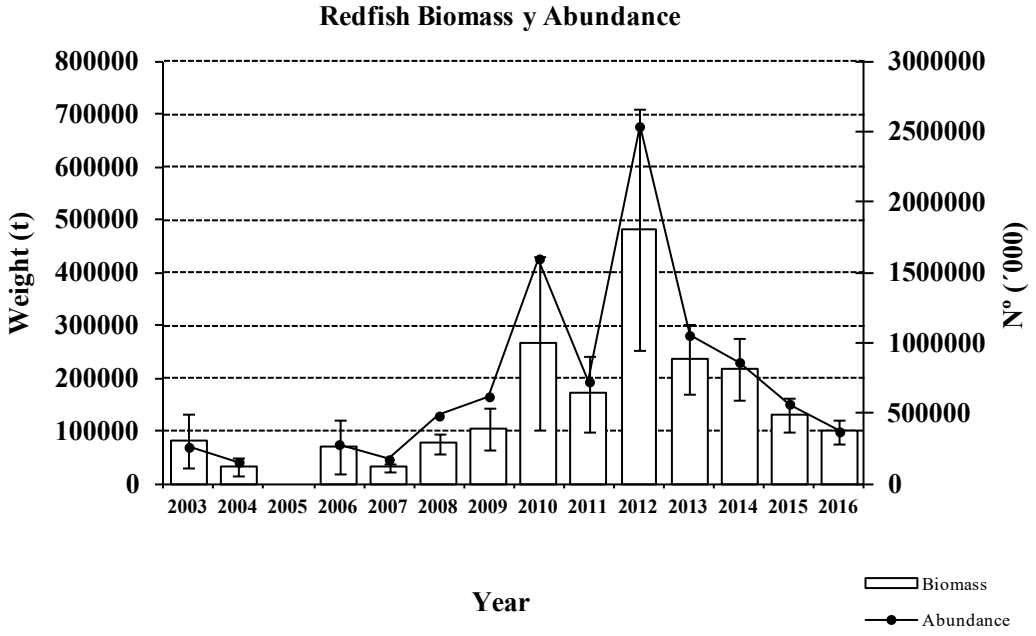


Fig.10. **Redfish** abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

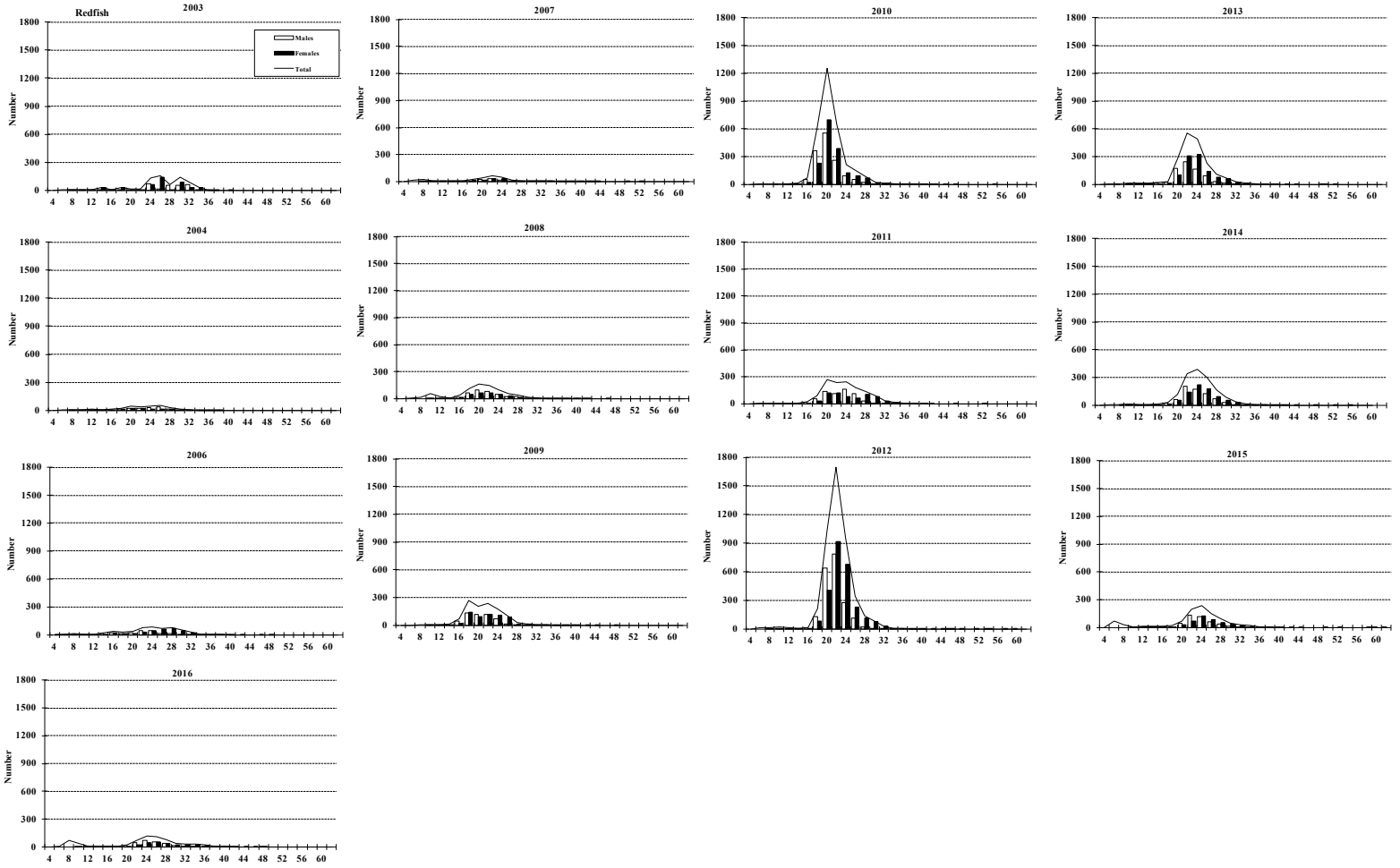


Fig. 11. **Redfish** length distribution (cm) in NAFO 3L: 2003-2016. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

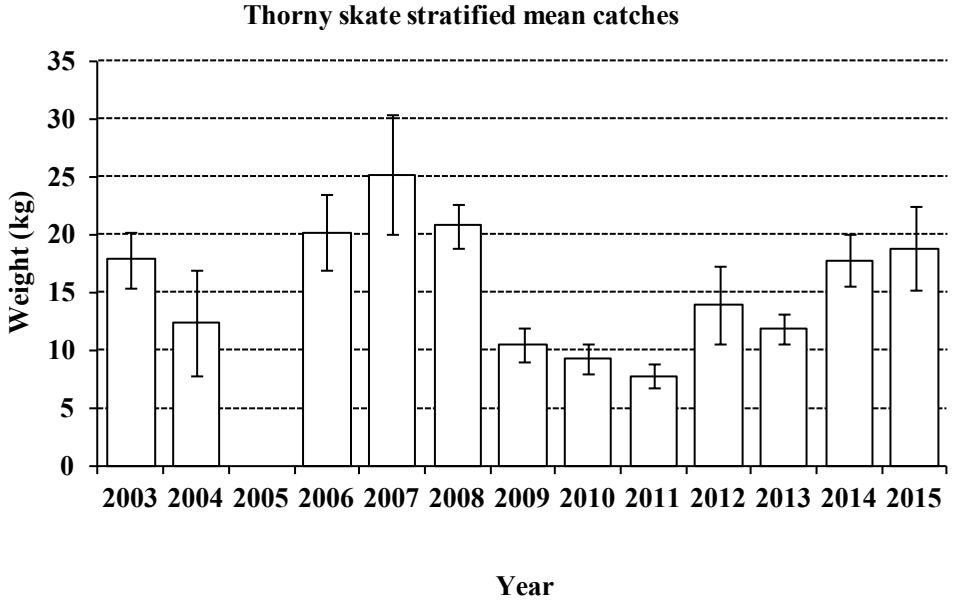


Fig. 12. **Thorny skate** stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

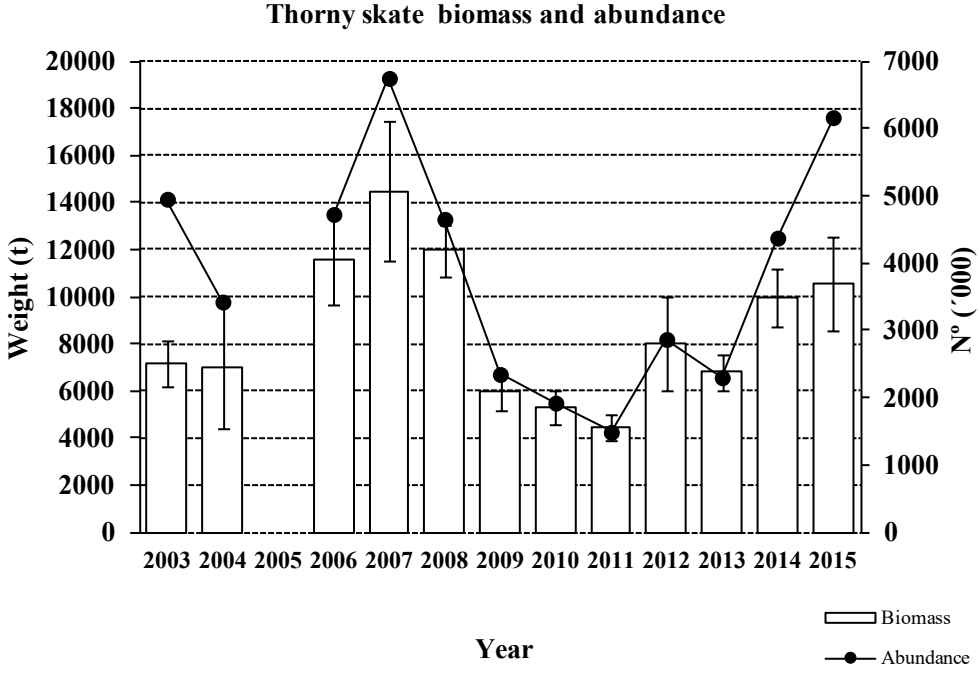


Fig. 13. **Thorny skate** abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

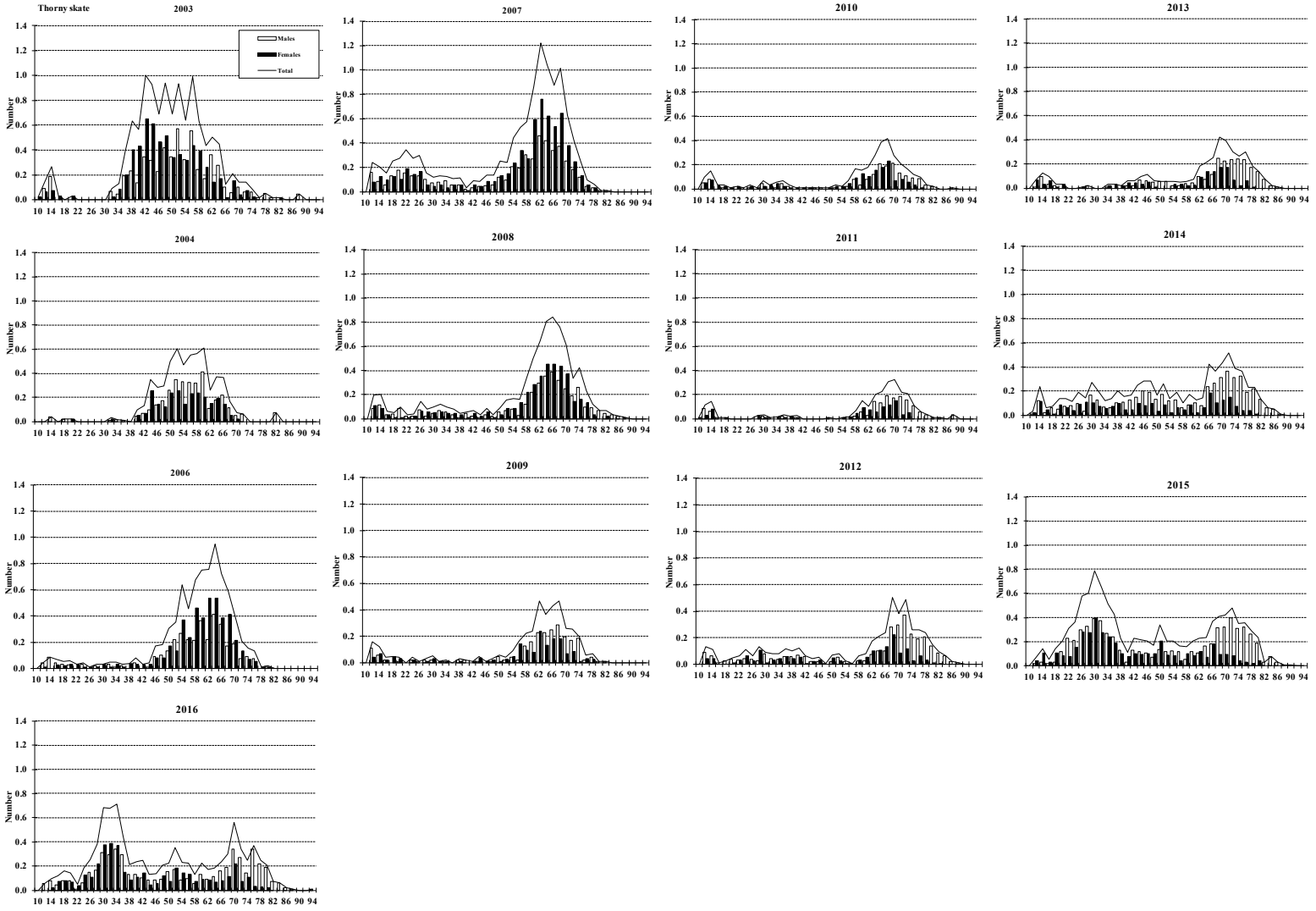
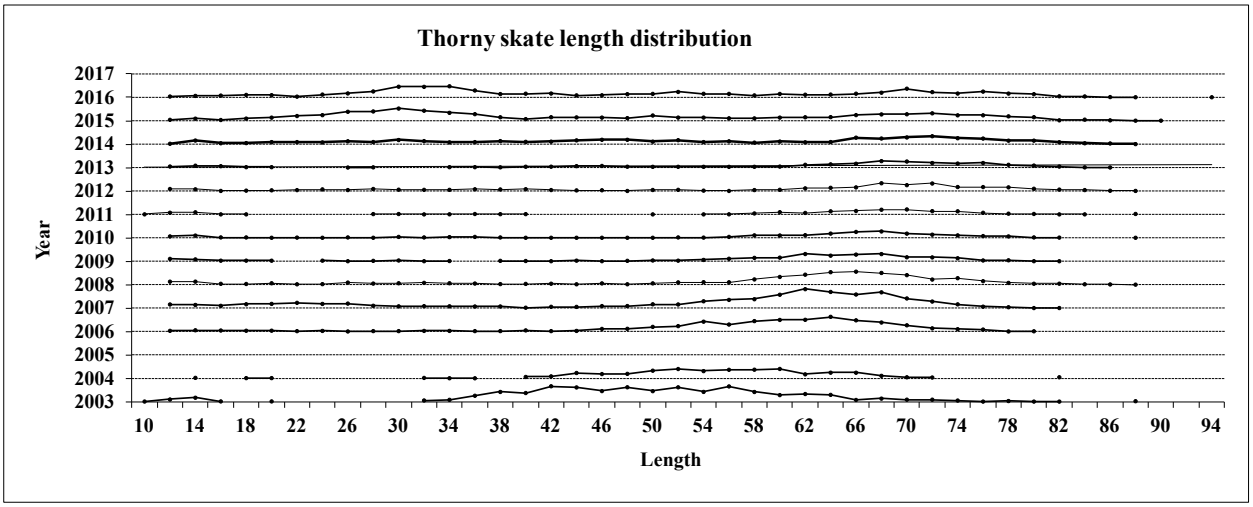


Fig. 14. Thorny skate length distribution (cm) in NAFO 3L: 2003-2016. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2016.



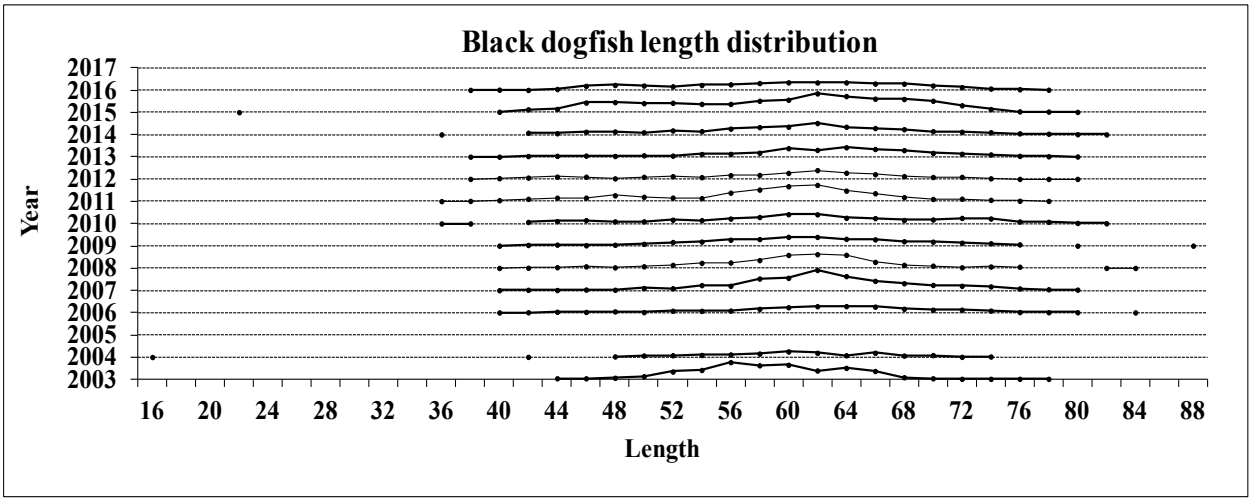


Fig. 15. **Thorny skate** and **black length** distribution (cm) in NAFO 3L: 2003-2016.

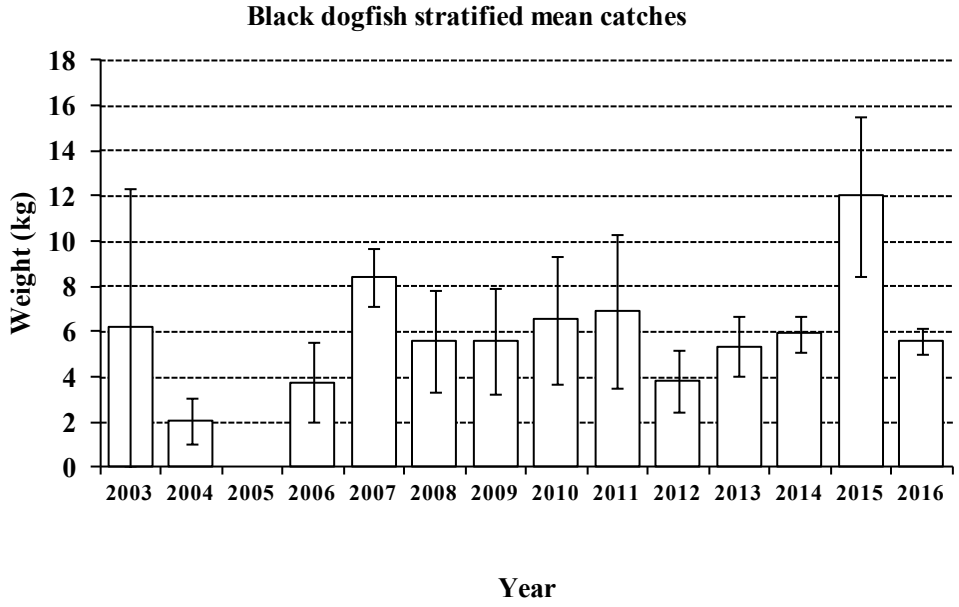


Fig. 16. **Black dogfish** stratified mean catches in Kg and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

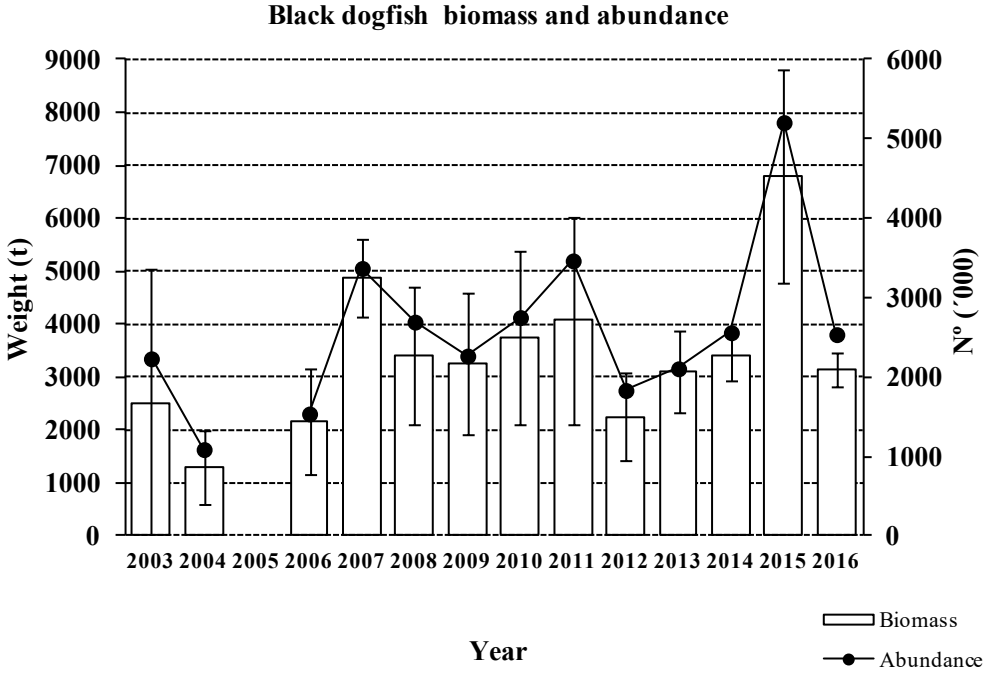


Fig. 17. **Black dogfish** abundance (´000), biomass in tonnes and ±SD by year. Spanish surveys in NAFO Division 3L: 2003 - 2016 (R/V *"Vizconde de Eza"*). In 2003, the data correspond to 69% of the total area prospected in 2006-2016.

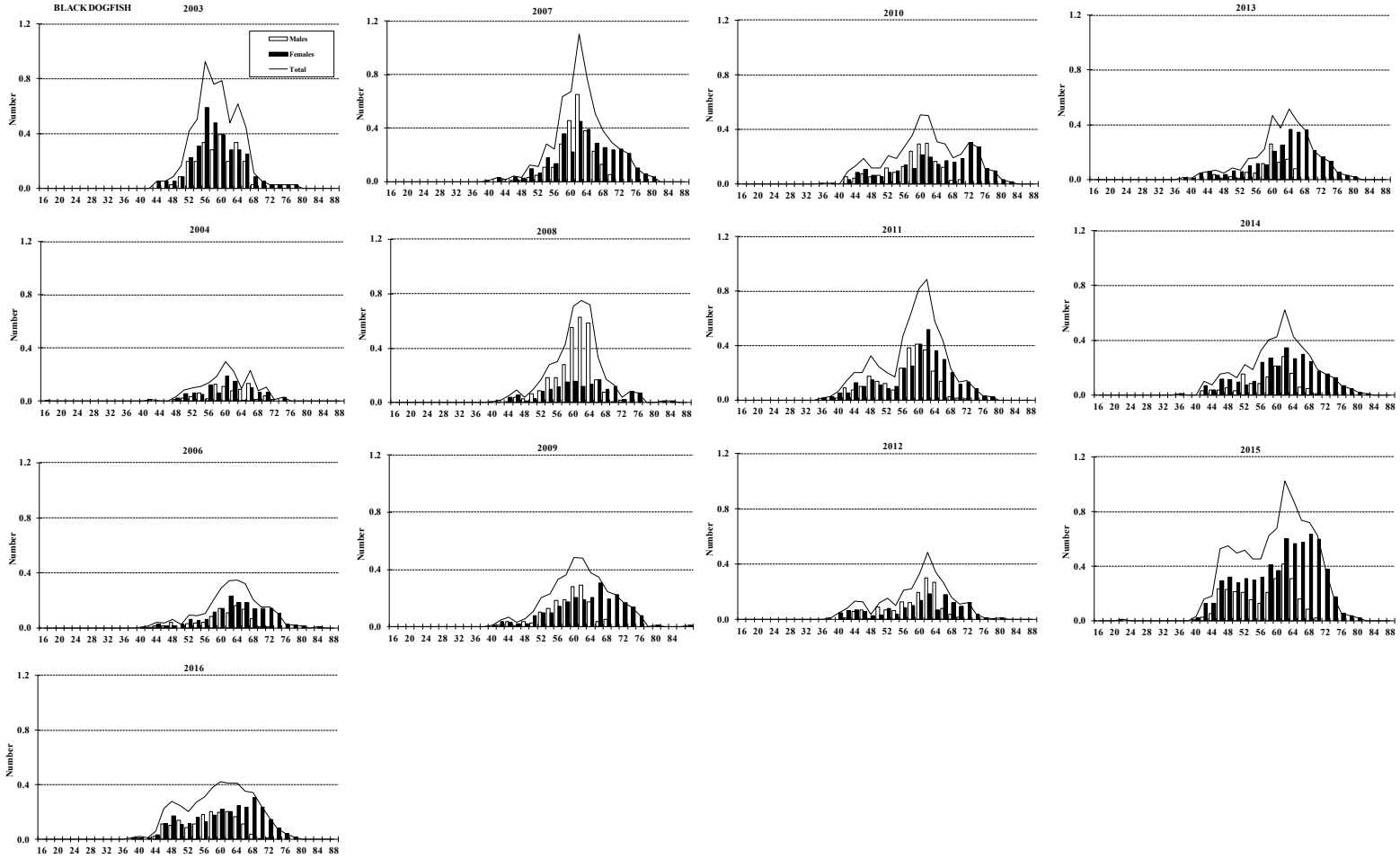


Fig.18. **Black dogfish** length distribution (cm) in NAFO 3L: 2003-2016. Number per stratified mean catches. In 2003, the data correspond to 69% of the total area prospected in 2006-2016.