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SCIENTIFIC COUNCIL MEETING – JUNE 2017**Spanish Research Report for 2016**

by

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Spanish catch and effort information used in this Report is based on the logbook data contributed by the Spanish Administration. The logbooks information for 2016 was available haul by haul. In previous years was used in this report the NAFO Observers effort information because the logbook effort information was grouped by day and it was difficult to know the distribution of effort by depth or fishery. Table 1 presents the Spanish catches by species and Division in 2016. In 2016 total effort of the Spanish fleet in NAFO Regulatory Area was 1,073 days.

In 2016, IEO scientific observers were on board 326 fishing days that it means 29 % of the Spanish total effort. All length, age and biological information presented in this paper is based on sampling carried out by IEO scientific observers: 658 samples were taken in 2016, with 68,721 individuals of different species examined (Table 2).

SUBAREA 3**A. Status of the fisheries**

A total of 11 Spanish trawlers operated in Div. 3LMNO NAFO Regulatory Area during 2016, amounting to 1,057 days (15,577 hours) of fishing effort. Table 3 presents the Spanish effort (fishing hours) since 2003 in NAFO Regulatory Area (NRA) Subarea 3. Total catches (Table 1) for all species combined in Div. 3LMNO were 12,950 tons in 2016.

Table 4 shows the effort (hours) by quarter, Division and their percentage by depth. Table 5 presents the percentage of the effort by Division, quarter and mesh size and Figure 1 shows the Spanish fleet footprint in 2016 based on the NAFO Observers information. Figure 1 show the directed hauls to each species. Directed hauls are when more than 50% of the total haul catches corresponds to that species.

These effort tables and figure show that the Spanish fleet carry out different directed fisheries in NAFO Subarea 3 characterized by different mesh size, target species, depth and fishing area. The Spanish fishery in NAFO Subarea 3 in 2015 has a similar patten described by Gonzalez-Costas (2012): Spanish fleet had the following fisheries in NAFO Division 3LMNO: 1) In Divisions 3LMNO at more than 600 meters depth with demersal 130 mm mesh size gear with Greenland halibut as target species. 2) In Divisions 3LMNO, mainly in Div 30 and 3M with demersal 130 mm mesh size gear in the 200-600 strata. The target species is the redfish. 3) In Divisions 3NO with 280 mm mesh size at less than 200 meters depth. The target species is the skates. 4) In Divisions 3NO with demersal 130 mm mesh size in the 200-600 strata. The target species is the Witch flounder. 5) In Division 3M at depth between 150-550 meters targeting cod with 130 mm mesh size gear.



Effort and fisheries by Division were: in Div. 3L, most of the effort was performed at more than 600 meters depth using cod-end mesh size of 135 mm, indicating that the fleet targeted Greenland halibut. Regarding Div. 3M, the 70% of the effort was carried out using 135 mm cod-end mesh size at less than 600 m depth targeting redfish and cod and at depths more than 600 m (30%) targeting Greenland halibut. In Div. 3N, the effort carried out using 280 mm was the 66% and with 135 mm cod-end mesh size was 34%, which indicates that the fleet targeted mainly skate in depth less than 200 m. and Greenland halibut in depth more than 600 m. Fishing effort in Div. 3O was limited (15%) targeting skates using mainly 280 mm mesh size (38%) in depth less than 200 meters and redfish in depth between 200-600 meters using 135 mm mesh size (44%).

In addition to NAFO observers (NAFO Observers Program), 8 IEO scientific observers were onboard Spanish vessels, comprising a total of 302 observed fishing days, around 29% coverage of the total Spanish effort. Besides recording catches, discards and effort, these observers carried out biological sampling of the main species taken in the catch. For Greenland halibut, roughhead grenadier, American plaice and cod this includes recording weight at length, sex-ratio, maturity stages, performing stomach contents analyses and collecting material for reproductive studies. Otoliths of these four species were also taken for age determination. In 2016, 629 length samples were taken, with 64,256 individuals of different species examined to obtain the length distributions (Table 2). Length and age distributions presented in this paper are based on sampling carried out by these observers. Length-weight relationships parameters used to calculate the Sum Of Products (SOP) of the length distribution are shown by species and stocks in Table 6. These relationships were estimated based on the data collected in the European Union surveys information carried out in 2016 in the NAFO Regulatory Area (NRA).

The Spanish activity en the NRA Subarea 3 in 2016, stock by stock, was the following:

Cod

Div. 3L: In Div. 3L, the most important part of the catches of this species were taken as by-catch in the redfish fishery. Table 7 shows the catch length distribution for Div. 3L cod. The bulk of the catches are comprised in the 30-50 cm range.

Div. 3NO: In Div. 3N, the most important part of the catches of this species were taken as by-catch in the skate fishery (91%) and in less degree in the redfish fishery (9%). In Div. 3O were taken the 22% of the Spanish catches of this stock and were by catch of the redfish and skate fisheries. Table 8 shows the catch length distribution for Div. 3NO cod. The bulk of the catches are comprised in the 35-110 cm range.

Div. 3M: Catches in Div. 3M were 1,232 tons and most of them were taken in the direct fishery. A small part was taken as by catch of the redfish fishery. The legal mesh size of the Cod fishery is 130 mm. In 2016 only trawlers operated in this fishery. The total length distributions of the Spanish catches are presented in Table 9 and we can observe that catches length distributions presents a bimodal distribution with 25-42 and 46-74 cm range. The mode in 2016 was around 37 cm. An important part of the specimens caught in 2016 were below the minimum landing size (41 cm).

Redfish

3M: In Div. 3M the redfish catches in 2016 have been 1402 tons and most of them were catch in a direct fishery and a small part of them was taken as by-catch in the cod fishery. Table 10 shows the Spanish catches length distribution for redfish Division 3M and it can be observed that the bulk of the catches are in the 24-35 cm range. This length distribution of catches in Div. 3M are bigger than the observed in Div 3O.

Div. 3LN: Spanish catches in 2016 were 235 tons. Most of the catches were taken in the reopened fishery for this stock. Table 11 shows the Spanish catches length distribution for redfish Division 3LN and it can be observed that the bulk of the catches are in the 20-30 cm range. This length distribution of catches in Div. 3LN is similar to the observed in Div. 3M and bigger than the observed in Div 3O.

Div. 3O: A directed fishery for this species took place in Div. 3O. Catches have reached 1663 tons in this Division, most of them with 130 mm mesh size. Catches length distribution for Div. 3O are presented in Table 12 and it can be observed that are smaller (19-28 cm) than the observed in Div. 3M and Div. 3LN.

American plaice

Div. 3LNO: Spanish catches in 2016 in Div. 3LNO were 215 tons. Most of the catches were taken with 280 mm mesh size (153 tons) as by-catch of the skate fishery and in less degree with 130 mm mesh size (62 tons). Length distributions with 280 mm mesh size have a bigger length range than the 130 mm mesh size. Table 13 presents the total length distribution for Div. 3LNO. It can be observed a clear different length between sexes, males are smaller than females. The bulk of catches were in the range of 28-48 cm.

Div. 3M: Catches in Div. 3M only amounted 24 tons and most of them were taken as by-catch of the cod and redfish fisheries. Table 14 presents the total length distribution for Div. 3M. As in the Div. 3LNO American plaice stock, it can be observed a clear different length between sexes, males are smaller than females. The bulk of catches were in the range of 37-55 cm.

Witch flounder

Div. 2J and 3KL: Spanish catches for this stock in 2016 were 28 tons and were taken in the small part of NAFO Regulatory Area (NRA) of Div. 3L as by catch of the Greenland halibut and redfish fishery. Table 15 shows the total Spanish length distribution for this species. The bulk of catches were in the range of 32-43 cm. As in the American plaice case, this species presents a clear different length distribution between sexes, males are smaller than females.

Div. 3M: This species in this Division was taken as by-catch in the Cod and redfish fishery. Catches this year were 20 tons and there is not management stock for this species in this Division. In 2016 there are some available catches length distributions for this species in Divisions 3M but the number of specimens measured in each sample was very low and therefore they are not considered representative of the size distribution of this species.

Div. 3NO: Spanish catches for this stock in 2016 were 49 tons. Most of the catches were taken with 130 mm cod end gear in a direct fishery and as by-catch of the Redfish and Greenland halibut fisheries (90%) and in less degree in the skate fishery (10%). Table 16 shows the total Spanish length distribution for this species. The bulk of catches were in the range of 28-46 cm. In this case the different length distributions between sexes are less evident.

Yellowtail flounder

Div. 3LNO: In 2016 the yellowtail flounder Spanish catches were 283 tons. Most of the catches were taken in Div. 3NO in the skate fishery (268 tons) as by-catch. Catches in Div. 3L were only 1 tons taken with 130 mm mesh size gear. Length distributions for yellowtail flounder in Div. 3LNO are presented in Table 17. Most of the catches are in the 30-40 cm length range. Females are more abundant and bigger than males in the catches.

Greenland halibut

Subareas 2 and Div. 3KLMNO: Greenland halibut continues to be one of the main target species for the Spanish fleet in NAFO area. In 2016 Spanish catches were 4,082 tons; most of them have been taken in the Flemish Pass area (Div. 3LM) at depths more than 700 m. The mesh size used for this fishery was equal or greater than 130 mm. Table 18 shows the length distributions of Spanish catches by Division (3L, 3M, 3N and 3O) and the total length distributions of Spanish catches in Divisions 3LMNO. Most of the catches were in the 41-61 cm length range and the mode of the length distribution was in 52 cm. This length distribution is bigger than the 2013 where the mode was around 41 cm. Total age composition based in the commercial Spanish Age Length Key (Table 24), mean weight and mean length at age for Div. 3LMNO are presented in Table 19. Most of the Greenland halibut catches corresponds to ages 5 to 10 with a peak at ages 7. This age catch age distribution is similar to the last years.

Figure 2 presents the Spanish fleet standardised CPUE updated with the 2016 data presented by Gonzalez-Costas and Gonzalez-Troncoso (2009). Results show two periods with different levels in the CPUE: one between 1992-2006 and other 2007-2015. In the last period the CPUE has been variable between years but the mean level of this period was higher than the period 1992-2006. Between 2015 and 2016 there has been a large increase in CPUE, with the value of 2016 being the highest in the whole series.

Thorny skate

Commercial catches of skates comprise a mix of skate species (*Raja radiata*, *Bathyraja spinicauda*, *Raja hyperborean*, *Raja senta*, etc). Thus the catch of skate in Table 1 refers to *Raja* spp. However, thorny skate dominates, comprising about 90% of the skate taken in the Spanish catches base on 2014-2016 data from the EU Spanish 3NO Survey.

Div. 3LNO: Spanish skate catches in 2016 were 2,819 tons. Most of the catches were taken in Div. 3N at depths less than 200 meters, where a fishery directed to thorny skate took place using 280 mm mesh size. Skate catches in Div. 3L (21 tons) were much smaller than those in Div. 3NO and they were by-catch of the Greenland halibut fishery (130 mm cod-end). Table 20 shows the total catches length distributions by sex of Div. 3LNO, all catches length samples were with 280 mm mesh size and they were taken in Division 3NO. Most of the catches were in the 29-74 cm length range, similar to years before. It can be observed a clear different length between sexes, males are bigger than females.

Div. 3M: Skate catches in Div. 3M (15 tons) were much smaller than those in Div. 3NO and they were by-catch of the Greenland halibut, redfish and cod fisheries. There is not available catches length distributions for this species in Division 3M.

Roughhead grenadier

Subarea 2 and 3: Roughhead grenadier is the main species taken as by-catch in the Greenland halibut fishery. Most of the 2016 catches and most of the length distribution samples were taken in Div. 3LM. Individuals were measured from tip of snout to base of first anal-fin ray (AFL) to the half centimetre below. Spanish catches in 2016 were 67 tons. Table 21 shows the AFL length distributions, grouping in 1 cm intervals, of Spanish catches for Div. 3LMNO. Most of the catches were in the 11-26 AFL length range, with a mode in 18 cm and a clear length difference between sexes, males are smaller than females.

Age distributions based on the Spanish commercial Age Length Key (Table 25), mean weight and mean length (AFL) at age of the total catch for Div. 3LMNO are presented in Table 22. Most of the Roughhead grenadier catches in 2016 were based on ages 4 to 14 with a mode in 6-8 years old. This age distribution is smaller than the observed in the previous years where the mode was around 8-10 years old.

White hake

Div. 3NO: Catches of this species in 2016 in Div 3NO (78 tons) were a small by-catch of different fisheries. In Division 3NO part of the catches (11 tons) were taken with the 280 mesh size. Catches in Div. 3NO take with 130 mm mesh size (108 tons) are by-catch of the redfish fishery. Table 23 shows the total catches length distributions by sex of Div. 3NO. It was only available three length distribution sample for 280 mm mesh size with a small number of measured individuals. Due to this problem, this sample could not be very representative of the catches distributions. Most of the catches were in the 17-22 cm length range.

(B) Research studies

The Spanish bottom trawl survey in NAFO Regulatory Area Div. 3NO was conducted from 23rd of May to the 21st of June 2016 on board the R/V Vizconde de Eza. The gear was a Campelen otter trawl with 20 mm mesh size in the cod-end. Prior to the survey, the effect of reducing the number of hauls was investigated, concluding that 7 hauls from the larger strata could be made redundant with hardly any difference in the resulting survey indexes. Thus a total of 115 valid hauls were taken within a depth range of 45-1480 m according to a stratified random design. This year we implemented a grid for the hydrographic profiles, with sampling points at 15 nm intervals on the shallower area and radials on the slope, instead of casting the data logger in each fishing station. This system however did not quite work for this survey, as it requires additional steaming time that we cannot afford in terms of working hours. The data logger we used failed in most cases deeper than 500 m, producing profiles with noise in a various range of depths, usually starting at 400 m. This problem persisted for nearly half of the survey. Furthermore, a stratified sampling by length class and sex was used to sample otoliths of Atlantic cod (605), American plaice (258) and Greenland halibut (319) for growth studies. Also, gonads of Atlantic cod (313) and American plaice (116) were sampled from histological maturity and fecundity studies. The results of this survey, including biomass indices with their errors and length distributions, as well as the calculated biomass based on conversion of length frequencies for Greenland halibut, American plaice, Atlantic

cod, yellowtail flounder, redfish, witch flounder, roughhead grenadier, thorny skate and white hake are presented as Scientific Council Research Documents. In addition, age distributions are presented for Greenland halibut and Atlantic cod.

In 2003 it was decided to extend the Spanish 3NO survey toward Div. 3L (Flemish Pass). In 2016, the bottom trawl survey in Flemish Pass (Div. 3L) was carry out on board R/V Vizconde de Eza using the usual survey gear (Campelen 1800) from July 28th to August 17th. The area surveyed was Flemish Pass to depths up 800 fathoms (1463 m) following the same procedure as in previous years. The number of hauls was 105 and 8 of them were nulls. Survey results, including abundance indices and length distributions of the main commercial species, are presented as Scientific Council Research documents. Survey results for Div. 3LNO of the northern shrimp (*Pandalus borealis*) were presented in SCR 16/052.

Samples for histological (cod, American plaice, roughhead grenadier) and aging (Greenland halibut, American plaice, roughhead grenadier and cod) studies were taken. Feeding studies on demersal species were performed and 3291 stomach contents were analysed in depths of 126 to 1447 m. Ninety-seven hydrographic profile samplings were made in a depth range of 108-1430 m.

The EU bottom trawl survey in Flemish Cap (Div. 3M) was carried out on board R/V Vizconde de Eza using the usual survey gear (Lofoten) from June 22th to July 23th 2016. The area surveyed was Flemish Cap Bank to depths up to 800 fathoms (1460 m) following the same procedure as in previous years. The number of hauls was 182 and one of them was null. Survey results including abundance indices of the main commercial species and age distributions for cod, redfish, American plaice, roughhead grenadier and Greenland halibut are presented as Scientific Council Research documents. Flemish Cap survey results for northern shrimp (*Pandalus borealis*) were presented in SCR 16/051. Samples for histological assessment of sexual maturity of cod, redfish, Greenland halibut and roughhead grenadier were taken. Oceanography studies continued to take place.

Surveys 2016 data on VME from bottom trawl groundfish surveys in NAFO Regulatory Area (Divs. 3LMNO):

New data on deep-water corals and sponges were presented from the 2016 EU and EU-Spanish bottom trawl groundfish surveys for 2016, and 2015 fall Canadian multispecies surveys. The data was made available to the NAFO WGESA to improve the mapping of Vulnerable Marine Species in the NAFO Regulatory Area (Divs. 3LMNO).

“Significant” catches (according to the NAFO definition from groundfish surveys) of deep-water corals and sponges were provided and mapped together with the closed areas. A total number of 480 bottom trawl hauls surveys were analyzed. Distribution maps of presence and catches above threshold for RV data of sponges, large gorgonians, small gorgonians and sea pens following the thresholds were presented.

Sponges: For the Spanish/EU 2016 data, sponges were recorded in 248 of the total tows (61.5% of the total tows analyzed). Significant catches of sponge (≥ 75 kg/tow) were found in 12 EU tows. The majority of these catches ($n = 7$) were located in the southern part of Flemish Pass in closed area 2; the others were located around Flemish Cap including; 1 in closed area 5, 1 within Beothuk Knoll sponge polygon, 1 within the northern Flemish Cap polygon, 1 adjacent to closed area 10, and 1 on the Sackville Spur. Of the total 12 tows, 4 were recorded outside of the closed areas with 2 of those falling within sponge polygons. Sponge catches for these tows ranged between 89.4 and 2238.5 kg.

For the Canadian 2015 data, sponges were recorded in 38 of the total tows (49.3% of the total tows analyzed), with depths ranging between 44 - 673 m. There were no significant catches of sponge (≥ 75 kg/tow). Of the 38 sponge catches observed, all were < 19 kg; 2 were located within the NAFO closure 2, and 2 located within sponge polygon near closure 2.

Larges gorgonians: For the Spanish/EU 2016 data, large gorgonians were recorded in 9 tows (2.2% of the total tows analyzed) with depths ranging between 516 - 1433 m. There were no significant catches but of the 9 tows that recorded large gorgonians (weights between 0.004-0.4 kg), 3 tows were located within closures (2 in closure 2, and 1 in closure 4), 1 within Beothuk Knoll polygon, and 4 records in close proximity to closures.

For the Canadian 2015 data, large gorgonians were recorded in 5 tows (6.5% of the total tows analyzed) with depths ranging between 243-651 m. There were 2 significant catches, 1 adjacent to the southern portion of closure 2 and the other located on the Sackville Spur. Other catches, below the threshold, were observed on Sackville Spur and 2 on the tail of the Grand Bank.

Small Gorgonians: For the Spanish/EU 2016 data, small gorgonians were recorded in 42 tows (10.4 % of the total tows analyzed), with depths ranging between 137 - 1415 m. Significant catches (> 0.15 kg/tow) were recorded in 2 tows (0.5% of the total tows) with both located on the tail of the Grand Bank. Other observations of small gorgonians were recorded throughout the NRA with 5 tows found within current closures (closures 2 and 5), and many others found adjacent to closures.

For the Canadian 2015 data, small gorgonians were recorded in 2 tows (2.6 % of the total tows analyzed), with depths of 223 - 307 m. There were no significant catches (> 0.15 kg/tow) recorded, and 2 observations were found on the tail of the Grand Bank.

Sea Pens: For the Spanish/EU 2016 data, sea pens were recorded in 133 tows (33% of the total tows analyzed) with depths ranging between 824 - 1164 m. Significant catches (> 1.4 kg/tow) were recorded in 4 tows (1.5-2.39 kg) with all located outside closed areas. Three of these significant catches were found within two adjacent polygons and the 4th located between the polygons. Other observations of sea pens were recorded throughout the NRA with 6 tows found within closure 2, 1 tow in closure 4, and 20 found within sea pen polygons.

For the Canadian 2015 data, sea pens were recorded in 7 tows (9% of the total tows analyzed) with depths ranging between 241 - 651 m. There were no significant catches (> 1.4 kg/tow) recorded. Other sea pen observations were documented with 2 in the vicinity of Sackville Spur, 1 in Flemish Pass and a cluster of 4 observations on the tail of the Gran Bank near the Canadian EEZ.

SUBAREA 6

A. Status of the fisheries

One Spanish trawler operated during 2016 in Div. 6G NAFO Regulatory Area using a midwater trawl gear. The fishing effort of this trawler was 16 days (116 hours). The most important species in catches was the *Beryx splendens* (Table 1).

Alfonsino Div. 6G: Catches of this species in 2016 in Div 6G were 127 tons made with a midwater trawl gear. Table 26 shows the total catches length distributions by sex of Div. 6G. Most of the catches were in the 36-43 cm total length range.

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Table 1. Spanish Catches (tons) in NAFO Area in 2016 by species and Division, based on the Logbook data.

Code	English name	Scientific name	Provisional STATLANT 21A					Total
			3L	3M	3N	3O	6G	
GHL	Greenland halibut	<i>Reinhardtius hippoglossoides</i>	2642	556	871	13		4082
RED	Atlantic redfishes nei	<i>Sebastes spp</i>	92	1402	143	1663		3301
SKA	Raja rays nei	<i>Raja spp</i>	21	15	2245	553		2834
COD	Atlantic cod	<i>Gadus morhua</i>	16	1232	125	35		1408
HKS	Silver hake	<i>Merluccius bilinearis</i>			2	285		287
YEL	Yellowtail flounder	<i>Limanda ferruginea</i>	1		257	24		283
PLA	American plaice	<i>Hippoglossoides platessoides</i>	24	25	140	51		240
ALF	Splendid alfonsino	<i>Beryx spp</i>					127	127
WIT	Witch flounder	<i>Glyptocephalus cynoglossus</i>	28	20	23	26		98
HAL	Atlantic halibut	<i>Hippoglossus hippoglossus</i>	7	9	44	31		90
HKW	White hake	<i>Urophycis tenuis</i>		5	4	74		83
RHG	Roughhead grenadier	<i>Macrourus berglax</i>	24	35	8	0		67
HAD	Haddock	<i>Melanogrammus aeglefinus</i>		11	17	17		46
RNG	Roundnose grenadier	<i>Coryphaenoides rupestris</i>	19	19	1			38
ANG	American angler	<i>Lophius americanus</i>			9	24		33
CAT	Wolffishes(=Catfishes) nei	<i>Anarhichas spp</i>	9	13	4	2		28
DGX	Dogfish sharks nei	<i>Squalidae</i>	6	16	1	1		23
MZZ	Diadromous fishes n.e.i.	<i>Osteichthyes</i>	4	1	1			5
HKR	Red Hake	<i>Urophycis chuss</i>	3	0	0			3
OIL	Oilfish	<i>Ruvettus pretiosus</i>					3	3
GDE	Threadfin rockling	<i>Gaidropsarus ensis</i>	1					1
GPE	Longfin Hake	<i>Phycis chesteri</i>	1					1
	Others					0	0	0
		Total tons	2898	3359	3894	2799	130	13080

Table 2. Samples and individuals sampled by the IEO Scientific Observers by species, mesh size and NAFO Division in 2016.

Code	Species	English_name	Catch/Disc.	Division	Mesh size	Samples	Ind.
CAB	<i>Anarhichas denticulatus</i>	Northern wolffish	C	3L	130 mm	2	40
CAB	<i>Anarhichas denticulatus</i>	Northern wolffish	C	3M	130 mm	2	21
CAA	<i>Anarhichas lupus</i>	Atlantic wolffish	C	3L	130 mm	1	37
CAS	<i>Anarhichas minor</i>	Spotted wolffish	C	3L	130 mm	1	7
CAS	<i>Anarhichas minor</i>	Spotted wolffish	C	3M	130 mm	2	4
ANT	<i>Antimora rostrata</i>	Blue antimora	C	3L	130 mm	5	402
ANT	<i>Antimora rostrata</i>	Blue antimora	C	3M	130 mm	2	195
API	<i>Apristurus sp</i>	Deep-water catsharks	C	3M	130 mm	2	5
RJQ	<i>Bathyraja spinicauda</i>	Spinetail ray	C	3M	130 mm	1	2
BYS	<i>Beryx splendens</i>	Splendid alfonsino	C	6G	3	29	4465
CFB	<i>Centroscyllium fabricii</i>	Black dogfish	C	3L	130 mm	4	95
CFB	<i>Centroscyllium fabricii</i>	Black dogfish	C	3M	130 mm	1	2
CFB	<i>Centroscyllium fabricii</i>	Black dogfish	C	3N	130 mm	3	239
RNG	<i>Coryphaenoides rupestris</i>	Roundnose grenadier	C	3L	130 mm	7	659
RNG	<i>Coryphaenoides rupestris</i>	Roundnose grenadier	C	3M	130 mm	5	501
COD	<i>Gadus morhua</i>	Cod	C	3L	130 mm	3	422
COD	<i>Gadus morhua</i>	Cod	C	3M	130 mm	17	1801
COD	<i>Gadus morhua</i>	Cod	C	3M	130 mm	13	1326
COD	<i>Gadus morhua</i>	Cod	C	3N	130 mm	1	141
COD	<i>Gadus morhua</i>	Cod	C	3N	280 mm	10	702
COD	<i>Gadus morhua</i>	Cod	C	3O	280 mm	5	200
GDE	<i>Gaidropsarus ensis</i>	Threadfin rockling	C	3L	130 mm	8	131
GDE	<i>Gaidropsarus ensis</i>	Threadfin rockling	C	3M	130 mm	2	32
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3L	130 mm	9	406
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3M	130 mm	7	44
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3M	130 mm	1	37
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3N	130 mm	6	620
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3N	280 mm	8	840
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3O	130 mm	2	130
HAL	<i>Hippoglossoides hippoglossus</i>	Atlantic halibut	C	3O	130 mm	1	3
PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3L	130 mm	11	549
PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3M	130 mm	10	432
PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3M	130 mm	5	215

PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3N	280 mm	34	3687
PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3N	130 mm	1	1
PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3O	280 mm	13	1797
PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3O	130 mm	3	424
ORY	<i>Hoplostethus atlanticus</i>	Orange roughy	C	3M	130 mm	1	1
YEL	<i>Limanda ferruginea</i>	Yellowtail flounder	C	3N	130 mm	1	162
YEL	<i>Limanda ferruginea</i>	Yellowtail flounder	C	3N	280 mm	24	3238
YEL	<i>Limanda ferruginea</i>	Yellowtail flounder	C	3O	280 mm	2	180
ANG	<i>Lophius americanus</i>	American angler	C	3O	130 mm	4	90
ELZ	<i>Lycodes sp</i>	Eelpouts	C	3L	130 mm	1	1
RHG	<i>Macrourus berglax</i>	Roughhead grenadier	C	3L	130 mm	28	2896
RHG	<i>Macrourus berglax</i>	Roughhead grenadier	C	3M	130 mm	6	324
RHG	<i>Macrourus berglax</i>	Roughhead grenadier	C	3N	130 mm	10	1222
RHG	<i>Macrourus berglax</i>	Roughhead grenadier	C	3O	130 mm	1	3
HAD	<i>Melanogrammus aeglefinus</i>	Haddock	C	3M	130 mm	1	2
HKS	<i>Merluccius bilineares</i>	Silver hake	C	3O	130 mm	2	273
MXO	<i>Myoxocephalus octodecemspinosus</i>	Longhorn sculpin	C	3N	280 mm	2	235
NZB	<i>Nezumia bairdi</i>	Marlin-spike grenadier	C	3L	130 mm	3	226
NZB	<i>Nezumia bairdi</i>	Marlin-spike grenadier	C	3M	130 mm	3	202
NZB	<i>Nezumia bairdi</i>	Marlin-spike grenadier	C	3O	130 mm	6	540
NNN	<i>Notacanthus chemnitzii</i>	Spiny eel	C	3M	130 mm	1	1
GPE	<i>Phycis chesteri</i>	Longfin hake	C	3O	130 mm	4	319
POK	<i>Pollachius virens</i>	Pollock	C	3O	130 mm	1	1
RJR	<i>Raja radiata</i>	Starry ray	C	3L	130 mm	1	95
RJR	<i>Raja radiata</i>	Starry ray	C	3M	130 mm	7	71
RJR	<i>Raja radiata</i>	Starry ray	C	3O	130 mm	3	14
RJR	<i>Raja radiata</i>	Starry ray	C	3N	280 mm	51	4862
RJR	<i>Raja radiata</i>	Starry ray	C	3O	280 mm	5	612
GHL	<i>Reinhardtius hippoglossoides</i>	Greenland halibut	C	3L	130 mm	76	9428
GHL	<i>Reinhardtius hippoglossoides</i>	Greenland halibut	C	3M	130 mm	15	1674
GHL	<i>Reinhardtius hippoglossoides</i>	Greenland halibut	C	3N	130 mm	27	3759
GHL	<i>Reinhardtius hippoglossoides</i>	Greenland halibut	C	3O	130 mm	2	46
RED	<i>Sebastes spp</i>	Redfish	C	3M	130 mm	7	400
RED	<i>Sebastes spp</i>	Redfish	C	3L	130 mm	12	1647
RED	<i>Sebastes spp</i>	Redfish	C	3M	130 mm	28	4218
RED	<i>Sebastes spp</i>	Redfish	C	3N	130 mm	6	831

RED	<i>Sebastes spp</i>	Redfish	C	30	130 mm	31	4898
HKW	<i>Urophycis tenuis</i>	White hake	C	30	130 mm	3	254
RJQ	<i>Bathyraja spinicauda</i>	Spinetail ray	D	3M	130 mm	1	1
COD	<i>Gadus morhua</i>	Cod	D	3M	130 mm	1	125
COD	<i>Gadus morhua</i>	Cod	D	3M	130 mm	1	52
COD	<i>Gadus morhua</i>	Cod	D	30	131 mm	1	2
PLA	<i>Hippoglossoides platessoides</i>	American plaice	D	3N	280 mm	11	1255
YEL	<i>Limanda ferruginea</i>	Yellowtail flounder	D	3N	130 mm	1	160
YEL	<i>Limanda ferruginea</i>	Yellowtail flounder	D	3N	280 mm	13	1658
RJR	<i>Raja radiata</i>	Starry ray	D	3L	130 mm	1	175
RJR	<i>Raja radiata</i>	Starry ray	D	3N	280 mm	10	1116
RJR	<i>Raja radiata</i>	Starry ray	D	30	280 mm	2	402
GHL	<i>Reinhardtius hippoglossoides</i>	Greenland halibut	D	3L	130 mm	1	44
RED	<i>Sebastes spp</i>	Redfish	D	3M	130 mm	3	392

Table 3. Fishing effort (hours) of the Spanish fleet in Divisions 3LMNO by year based on the Logbook data.

3LMNO	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Effort (Hours)	106821	76028	60128	44044	25163	21408	21250	22703	25276	25410	18602	18271
3LMNO	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Effort (Hours)	18031	15577										

Table 4. Fishing effort (hours) of the Spanish fleet in 2016, by quarter, depth strata and Division, as well as percentage of effort by quarter and Division based on the NAFO Observers data.

Division	Depth	1st Q	2nd Q	3rd Q	4th Q	Total	% Div.
3L	<200	7		2		0%	
	200-600			74		2%	
	>600	1574	1065	824	902	98%	
	Total	1581	1065	900	902	4448	29%
3M	<200		39	163	22	8%	
	200-600	393	93	1342	22	63%	
	>600	135	470	209	56	30%	
	Total	527	602	1715	99	2943	19%
3N	<200	182	681	2067	807	64%	
	200-600	65	74	39	44	4%	
	>600	509	453	640	269	32%	
	Total	757	1209	2746	1120	5831	37%
3O	<200	379	432	333	135	54%	
	200-600	168	290	241	341	44%	
	>600		31	8		2%	
	Total	546	753	581	476	2356	15%
	Total Hours	3411	3628	5942	2596	15577	100%
	%	22%	23%	38%	17%	100%	

Table 5. Percentage of the 2016 Spanish effort in SA 3 by mesh size, quarter and Division based on the NAFO Observers data.

Div.	Mesh Size	1st Q	2nd Q	3rd Q	4th Q	Total
3L	<90 mm					
	100-200 mm	100%	100%	100%	100%	100%
	>200 mm					
3M	<90 mm					
	100-200 mm	100%	100%	100%	100%	100%
	>200 mm					
3N	<90 mm					
	100-200 mm	68%	39%	25%	28%	34%
	>200 mm	32%	61%	75%	72%	66%
3O	<90 mm					
	100-200 mm	24%	65%	70%	91%	62%
	>200 mm	76%	35%	30%	9%	38%

Table 6. Parameters of the length-weight relationship ($W(g) = a \cdot L(cm)^b$) by species (2016).

Species	Source	a	b
Greenland halibut	FC Survey	0.00479	3.1355
Redfish 3O - 3LN	3NO Survey	0.0128427	2.987699
Redfish 3M	FC Survey	0.0172	2.9749
Roughhead grenadier	FC Survey	0.137609	2.8396
Witch flounder	3NO Survey	0.0020936	3.306787
American plaice 3LNO	3NO Survey	0.0033388	3.2565174
American plaice 3M	FC Survey	0.00441	3.2374
Cod 3NO	3NO Survey	0.0041886	3.1601906
Cod 3M	FC Survey	0.007232	3.0501
Cod 3L	FC Survey	0.007232	3.0501
Yellowtail Flounder	3NO Survey	0.0109858	2.9337635
Skate	3NO Survey	0.0101813	2.9813511
White Hake	3NO Survey	0.0025221	3.2787139
Splendid alfoncino	Commercial 17	0.0043623	3.2436936

Table 7. Length distribution of 3L Spanish Cod catches.

Cod Length (cm)	Division 3L			Total
	Males	Females	Ind.	
20				0
21				0
22	46	0	0	46
23	0	0	0	0
24	0	0	0	0
25	0	46	0	46
26	0	0	0	0
27	0	46	0	46
28	46	46	0	92
29	231	231	0	462
30	185	139	0	323
31	139	92	0	231
32	323	277	0	600
33	139	508	0	647
34	647	693	0	1339
35	878	554	0	1432
36	1062	878	0	1940
37	462	231	0	693
38	462	508	0	970
39	508	924	0	1432
40	323	323	0	647
41	416	462	0	878
42	277	462	0	739
43	185	370	0	554
44	231	185	0	416
45	92	323	0	416
46	416	231	0	647
47	231	323	0	554
48	323	231	0	554
49	231	277	0	508
50	139	231	0	370
51	139	139	0	277
52	185	277	0	462
53	92	231	0	323
54	46	139	0	185
55	46	92	0	139
56	92	0	0	92
57	92	139	0	231
58	0	92	0	92
59	139	139	0	277
60	46	46	0	92
61	46	0	0	46
62	0	46	0	46
63	46	0	0	46
64	0	46	0	46
65	46	0	0	46

66	46	46	0	92
67	92	0	0	92
68	0	0	0	0
69	0	0	0	0
70	0	46	0	46
71	0	46	0	46
72	0	0	0	0
73	0	46	0	46
74	0	0	0	0
75	0	0	0	0
76	0	46	0	46
77	0	0	0	0
78	0	46	0	46
79	0	46	0	46
80	0	0	0	0
81	0	46	0	46
Total	9145	10346	0	19492

Samples	3
Ind. Sampled	422
Catch (ton)	16
SOP	1.09

Table 8. Length distribution of 3NO Spanish Cod catches.

Cod Length (cm)	Division 3NO			Total
	Males	Females	Ind.	
20	0	0	35	35
21	0	0	12	12
22	0	0	0	0
23	0	0	16	16
24	0	0	39	39
25	0	0	12	12
26	0	0	0	0
27	0	0	0	0
28	0	12	32	44
29	0	12	0	12
30	0	121	16	137
31	0	112	0	112
32	0	144	0	144
33	0	0	0	0
34	0	121	0	121
35	0	242	0	242
36	656	0	0	656
37	121	121	0	242
38	217	217	0	433
39	96	121	0	217
40	484	258	0	742
41	0	0	0	0
42	242	242	0	484
43	242	274	0	516
44	379	484	0	863
45	217	121	0	338
46	258	96	0	354
47	846	137	0	983
48	16	0	0	16
49	0	121	0	121
50	678	133	0	810
51	374	0	0	374
52	0	484	0	484
53	253	363	0	616
54	121	0	0	121
55	0	363	0	363
56	217	217	0	433
57	0	242	0	242
58	107	242	0	349
59	121	0	0	121
60	133	242	0	374
61	217	277	0	494
62	76	716	0	793
63	288	137	0	425
64	619	402	0	1021
65	266	142	0	408

66	433	242	0	675
67	445	156	0	601
68	181	376	0	557
69	268	217	0	485
70	433	459	0	892
71	312	242	0	554
72	903	642	0	1545
73	619	144	0	763
74	749	166	0	915
75	592	412	0	1004
76	195	279	0	474
77	269	332	0	601
78	157	157	0	314
79	294	274	0	568
80	469	499	0	968
81	477	285	0	762
82	115	201	0	316
83	235	145	0	380
84	344	247	0	590
85	212	156	0	368
86	135	173	0	308
87	279	135	0	414
88	272	400	0	671
89	245	148	0	394
90	86	167	0	254
91	260	255	0	514
92	244	311	0	555
93	27	132	0	159
94	139	232	0	371
95	161	17	0	178
96	136	292	0	428
97	274	235	0	509
98	120	242	0	362
99	33	42	0	75
100	50	90	0	139
101	161	200	0	361
102	46	294	0	340
103	89	193	0	281
104	104	92	0	196
105	231	107	0	338
106	52	104	0	156
107	222	159	0	380
108	187	126	0	313
109	8	49	0	58
110	20	65	0	85
111	159	157	0	315
112	90	43	0	133
113	4	85	0	89
114	7	32	0	40
115	0	0	0	0

116	8	12	0	20
117	12	5	0	17
118	8	28	0	36
119	13	77	0	90
120	0	12	0	12
121	95	106	0	201
122	0	16	0	16
123	146	0	0	146
124	0	0	0	0
125	0	4	0	4
126	5	9	0	14
127	0	0	0	0
128	0	4	0	4
129	8	73	0	82
130	0	5	0	5
131	0	0	0	0
132	0	146	0	146
133	0	0	0	0
134	0	73	0	73
135	0	4	0	4
Total	19085	17688	162	36935

Samples	16
Ind. Sampled	1043
Catch (ton)	159
SOP	1.06

Table 9. Length distribution of 3M Spanish Cod catches.

Cod Length (cm)	Division 3M			Total
	Males	Females	Ind.	
25	0	2963		2963
26	5363	5767		11130
27	5579	5538		11117
28	201	8160		8361
29	417	3183		3600
30	9042	524		9566
31	296	743		1039
32	6028	2911		8939
33	3629	392		4021
34	917	10276		11193
35	4087	7855		11943
36	8821	14396		23216
37	14380	11700		26080
38	12426	9514		21940
39	11668	12273		23942
40	6043	6773		12815
41	11220	3479		14699
42	2319	2237		4556
43	1183	1340		2523
44	1998	1419		3416
45	3658	1045		4703
46	1601	655		2256
47	4298	1521		5820
48	4588	2534		7121
49	6103	2804		8907
50	4185	7292		11477
51	9994	4393		14388
52	9592	11476		21067
53	9659	6462		16121
54	10036	8364		18399
55	12687	7775		20462
56	11381	7376		18757
57	14112	7606		21718
58	16699	5728		22427
59	14062	6032		20094
60	9986	6830		16816
61	8140	8000		16139
62	10908	6482		17390
63	9361	8070		17431
64	8920	4503		13422
65	9144	4653		13797
66	6966	4942		11908
67	4881	5628		10509
68	4974	5671		10645

69	5415	4569	9984
70	3250	3314	6564
71	4154	2471	6624
72	1968	1390	3358
73	2473	1083	3557
74	1196	2209	3405
75	1139	1664	2803
76	1054	782	1837
77	159	777	937
78	425	1168	1593
79	1197	1423	2620
80	1173	1348	2521
81	816	1602	2418
82	270	427	697
83	266	1795	2060
84	112	935	1046
85	602	947	1549
86	173	336	509
87	684	459	1143
88	292	1081	1373
89	1193	764	1956
90	1580	865	2446
91	797	850	1646
92	80	1235	1315
93	23	325	348
94	773	381	1154
95	623	366	989
96	831	947	1778
97	305	246	551
98	561	292	852
99	128	1185	1313
100	214	229	443
101	35	569	603
102	118	372	490
103	0	150	150
104	63	726	789
105	0	816	816
106	73	431	504
107	0	252	252
108	0	35	35
109	0	124	124
110	0	652	652
111	0	0	0
112	0	226	226
113	0	0	0
114	0	539	539
115	0	1065	1065
116	36	187	223

117	73	466	539
118	182	314	496
119	0	541	541
120	0	2965	2965
121	0	1377	1377
122	0	284	284
123	0	118	118
124	0	0	0
125	0	1070	1070
126	0	0	0
127	0	0	0
128	0	245	245
129	0	0	0
130	0	0	0
131	0	0	0
132	0	0	0
133	0	0	0
134	0	0	0
135	0	0	0
136	0	0	0
137	0	0	0
138	0	0	0
139	0	214	214
140			0
Total	346059	298483	0 644542

Samples	30
Ind. Sampled	3127
Catch (tons)	1232
SOP	0.99

Table 10. Redfish 3M stock Spanish catches length distribution.

Redfish Length (cm)	Division 3M			Total
	Males	Females	Ind.	
18	160	0	0	160
19	294	0	0	294
20	6275	803	0	7078
21	4206	6275	0	10481
22	23055	9051	465	32571
23	40130	2251	0	42381
24	71388	18130	0	89518
25	138917	21750	0	160667
26	213694	60548	0	274242
27	269800	83904	0	353703
28	393991	198515	0	592506
29	347562	351814	0	699376
30	198787	416371	0	615158
31	61776	427532	0	489308
32	29266	283367	0	312633
33	12073	148200	0	160273
34	7326	71645	0	78970
35	2063	41335	0	43398
36	423	34574	0	34997
37	2720	17101	0	19821
38	1603	8671	0	10275
39	913	8284	0	9197
40	417	5441	0	5858
41	140	3459	0	3599
42	172	530	0	702
43	4490	554	0	5044
44	3245	1625	0	4870
45	0	2620	0	2620
46	47	4931	0	4978
47	0	183	0	183
48	16	63	0	78
49	0	6531	0	6531
50	0	141	0	141
51	0	3230	0	3230
52	0	47	0	47
53	0	0	0	0
54	0	31	0	31
55	0	313	0	313
56	0	31	0	31
Total	1834949	2239849	465	4075263
Samples				35
Ind. Sampled				4618
Catch (tons)				1402
SOP				0.80

Table 11. Redfish 3LN stock Spanish catches length distribution.

Redfish Length (cm)	Division 3LN			Total
	Males	Females	Ind.	
15	159	0	0	159
16	0	0	0	0
17	0	0	0	0
18	2976	0	0	2976
19	6610	0	0	6610
20	22716	8378	0	31093
21	83464	33191	0	116655
22	92407	66253	0	158660
23	117400	66151	0	183551
24	71905	86037	0	157942
25	42488	58246	0	100733
26	39711	64940	0	104651
27	22446	43249	0	65695
28	7147	21851	0	28998
29	3665	17528	24	21217
30	3039	13100	42	16180
31	2964	14385	58	17407
32	104	7544	50	7698
33	152	6199	46	6396
34	74	5677	37	5789
35	53	2416	42	2510
36	46	796	83	925
37	105	135	37	278
38	98	14	37	149
39	46	49	17	111
40	183	7	8	198
41	163	0	0	163
42	0	0	4	4
43	0	0	0	0
44	46	204	0	250
45	0	579	0	579
46	0	46	0	46
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	163	0	163
51	0	0	0	0
52	0	159	0	159
53	0	0	0	0
54	0	0	0	0
55	0	0	0	0
56	0	0	0	0
57	0	0	0	0
58	0	0	0	0
59	0	0	0	0
60	0	0	0	0
61	0	0	0	0
62	0	0	0	0
63	0	0	4	4
Total	520164	517295	489	1037949
Samples				18
Ind. Sampled				2478
Catch (tons)				235
SOP				1.17

Table 12. Redfish 30 stock Spanish catches length distribution.

Redfish Length (cm)	Males	30 Females	Ind.	Total
10				0
11	101	0	0	101
12	2050	0	0	2050
13	3979	0	0	3979
14	101	0	0	101
15	3656	101	0	3758
16	2794	0	0	2794
17	46884	12139	0	59022
18	75447	34176	0	109624
19	100808	83583	0	184390
20	354861	211125	0	565986
21	893556	420761	0	1314317
22	1104581	762211	0	1866792
23	865691	933839	0	1799531
24	380869	858365	0	1239234
25	192026	583935	0	775961
26	103749	300179	0	403928
27	52244	207519	0	259763
28	48211	119845	0	168056
29	28093	79383	0	107476
30	37058	36035	0	73094
31	44470	69177	0	113647
32	7412	42185	0	49597
33	7412	15097	0	22508
34	0	93	0	93
35				0
36				0
37				0
38				0
39				0
40				0
Total	4356055	4769747	0	9125802
Samples				31
Ind. Sampled				4898
Catch (tons)				1663
SOP				1.09

Table 13. American plaice 3LNO stock Spanish catches length distribution.

American Plaice Length (cm)	Division 3LNO			Total
	Males	Females	Ind.	
15	35	0	0	35
16	0	108	0	108
17	311	52	423	786
18	35	246	423	704
19	318	1157	212	1687
20	1095	2120	0	3215
21	619	1084	0	1704
22	791	1021	0	1812
23	1908	876	0	2784
24	1479	1210	0	2689
25	1195	872	0	2068
26	1010	954	0	1963
27	2411	1136	0	3547
28	3012	2430	0	5442
29	3664	2862	0	6527
30	6074	3598	0	9672
31	11850	6413	0	18263
32	16624	8931	0	25555
33	13219	14223	0	27441
34	15784	13957	0	29741
35	18265	15043	0	33308
36	14072	22203	0	36275
37	7721	25998	0	33719
38	11693	25140	0	36833
39	4130	21253	0	25383
40	5314	16583	0	21897
41	4973	17782	129	22884
42	3339	18124	0	21463
43	1508	11690	0	13198
44	1882	9353	0	11234
45	621	8227	0	8848
46	965	5402	0	6367
47	1343	5007	0	6350
48	451	3999	0	4450
49	773	2090	0	2863
50	207	2952	0	3159
51	1125	1223	0	2348
52	223	1941	0	2165
53	902	3280	0	4182
54	55	1763	0	1818
55	479	2295	0	2774
56	255	1616	0	1870
57	32	775	0	807
58	0	1028	0	1028
59	162	1185	0	1347
60	59	836	0	896

61	0	275	0	275
62	0	679	0	679
63	0	412	0	412
64	0	457	0	457
65	0	608	0	608
66	0	546	0	546
67	0	122	0	122
68	0	230	0	230
69	0	143	0	143
70	0	87	0	87
71	0	0	0	0
72	0	0	0	0
73	0	0	0	0
74	0	73	0	73
75	0	0	0	0
76	0	0	0	0
77	0	73	0	73
Total	161984	293739	1188	456911

Samples	71
Ind. Sampled	7830
Catch (tons)	215
SOP	0.89

Table 14. American plaice 3M stock Spanish catches length distribution.

American Plaice Length (cm)	Division 3M			Total
	Males	Females	Ind.	
27	27	0	0	27
28	27	0	0	27
29	0	0	0	0
30	0	0	0	0
31	0	25	0	25
32	34	34	0	68
33	34	0	0	34
34	225	68	0	293
35	191	34	0	225
36	234	68	0	301
37	305	223	0	528
38	493	219	0	712
39	330	303	0	633
40	231	466	0	697
41	618	290	0	908
42	603	212	0	815
43	764	85	0	850
44	857	144	0	1001
45	852	171	0	1023
46	489	246	4	739
47	285	476	11	772
48	238	602	11	851
49	195	813	7	1015
50	30	1482	7	1520
51	34	1409	4	1446
52	0	1292	7	1299
53	0	943	0	943
54	0	894	0	894
55	0	527	0	527
56	0	364	0	364
57	0	283	4	287
58	0	304	0	304
59	0	258	0	258
60	0	105	0	105
61	0	34	0	34
62	0	28	0	28
63	0	55	0	55
64	0	34	0	34
Total	7097	12490	53	19640
Samples				15
Ind. Sampled				647
Catch (tons)				25
SOP				1.01

Table 15. Witch flounder Spanish catches length distribution for Div. 3L.

Witch flounder Length (cm)	Males	3L Females	Ind.	Total
29	0	0	58	58
30	0	121	391	511
31	115	0	1103	1218
32	0	78	3033	3112
33	431	338	4470	5238
34	1313	631	4136	6080
35	256	1094	4309	5659
36	419	649	6124	7193
37	490	780	3861	5131
38	648	395	3861	4904
39	1596	1228	1379	4203
40	672	1569	1930	4171
41	938	2208	276	3422
42	487	2313	0	2799
43	178	2904	0	3082
44	310	1787	0	2097
45	115	1963	0	2078
46	58	1084	0	1141
47	0	2074	0	2074
48	0	1451	0	1451
49	0	579	0	579
50	0	720	0	720
51	0	0	0	0
52	0	362	0	362
53				0
Total	8025	24328	34930	67283
Samples				9
Ind. Sampled				406
Catch (tons)				28
SOP				1.07

Table 16. Witch flounder Spanish catches length distribution for Div. 3NO.

Witch flounder Length (cm)	Males	Females	3NOL Ind.	Total
23	0	677	0	677
24	0	677	0	677
25	0	0	0	0
26	677	677	0	1355
27	0	2036	0	2036
28	3387	2710	0	6097
29	2032	5419	0	7452
30	1553	7091	3	8647
31	2813	2773	0	5587
32	4501	6421	0	10923
33	3345	3865	3	7214
34	3126	2801	0	5927
35	1596	3211	0	4806
36	1896	4238	0	6134
37	1356	2120	0	3476
38	2054	1149	0	3203
39	2547	3147	0	5694
40	3292	3050	0	6342
41	4180	4092	0	8272
42	1132	3083	0	4215
43	3255	3612	0	6867
44	1083	4589	0	5671
45	235	4349	0	4584
46	145	4467	0	4612
47	47	2470	0	2517
48	116	2287	0	2403
49	0	1232	0	1232
50	673	1577	0	2250
51	918	1576	0	2495
52	745	1162	0	1907
53	451	645	0	1095
54	0	37	0	37
55	95	29	0	124
56	0	130	0	130
57	0	5	0	5
58	0	5	0	5
59	0	5	0	5
60	0	0	0	0
61	0	0	0	0
62	0	12	0	12
63	0	0	0	0
64	0	10	0	10
Total	47250	87439	7	134696
Samples				16
Ind. Sampled				1590
Catch (tons)				49
SOP				0.93

Table 17 Yellowtail flounder Spanish catches length distribution for Div. 3LNO.

Yellowtail flounder	3LNO			
Length (cm)	Males	Females	Ind.	Total
8	0	0	344	344
9	0	0	0	0
10	0	0	7	7
11	0	0	0	0
12	0	0	0	0
13	0	0	0	0
14	0	0	0	0
15	0	0	15	15
16	0	0	465	465
17	121	0	0	121
18	0	128	106	234
19	0	0	344	344
20	0	0	7	7
21	139	204	0	342
22	465	137	0	602
23	706	377	0	1083
24	278	296	0	574
25	1117	1462	8	2587
26	677	1891	0	2568
27	1312	1103	0	2415
28	2462	819	0	3282
29	10239	6583	0	16823
30	35139	5693	0	40831
31	50973	16649	0	67622
32	75680	34728	0	110408
33	56720	50732	0	107452
34	40750	69194	0	109943
35	16783	72668	0	89452
36	13542	66103	0	79645
37	9418	46789	0	56207
38	1636	28575	0	30211
39	198	32252	0	32450
40	0	35028	0	35028
41	83	12566	0	12649
42	48	14365	0	14413
43	0	11573	0	11573
44	0	8800	0	8800
45	0	2387	0	2387
46	0	1181	0	1181
47	0	1131	0	1131
48	0	1810	0	1810
49	0	209	0	209
50	0	7	0	7
51	0	0	0	0
52	0	149	0	149
Total	318487	525587	1294	845368
Samples				27
Ind. Sampled				3580
Catch (tons)				283
SOP				0.87

Table 18. Greenland halibut Spanish catches length distribution for Div. 3L and 3M.

Length (cm)	Division 3L				Division 3M			
	Males	Females	Ind.	Total	Males	Females	Ind.	Total
19	0	3	0	3	0	0	0	0
20	5	0	0	5	0	0	0	0
21	5	0	0	5	0	0	0	0
22	271	0	0	271	0	0	0	0
23	0	10	0	10	0	0	0	0
24	5	16	0	21	0	0	0	0
25	10	26	0	36	0	0	0	0
26	244	26	0	270	0	0	0	0
27	10	249	0	260	0	0	0	0
28	152	3	0	155	0	0	0	0
29	342	5	0	348	0	0	0	0
30	715	501	332	1548	0	0	0	0
31	614	1440	332	2387	0	0	0	0
32	1818	2075	166	4059	0	0	0	0
33	842	2773	498	4113	0	0	0	0
34	1080	1836	664	3580	0	0	0	0
35	1028	1518	332	2878	358	0	0	358
36	2810	3277	498	6586	485	1240	0	1725
37	2243	4422	498	7164	843	3902	0	4745
38	3065	5203	1162	9430	1115	4902	0	6018
39	4317	13181	498	17996	2589	5485	0	8074
40	6884	14309	996	22189	3130	7259	0	10389
41	10381	12406	1162	23949	2092	8296	0	10388
42	11518	19715	1494	32728	2157	6611	0	8768
43	17580	27187	664	45431	2721	8561	0	11282
44	20074	30797	498	51369	3490	6949	0	10440
45	28067	38811	1162	68040	2388	9538	0	11926
46	32868	59348	830	93046	2212	11456	0	13668
47	26960	67205	1494	95659	3331	13322	0	16653
48	40942	86163	1661	128766	5714	12413	0	18127
49	43974	84469	1515	129958	6367	18018	0	24386
50	37819	118565	2159	158543	9031	18210	0	27241
51	37368	112000	1328	150697	7702	13828	0	21530
52	33067	137735	2325	173127	6428	24080	0	30508
53	25279	133898	996	160173	6538	18772	0	25310
54	21000	139667	498	161165	4255	24251	0	28506
55	18798	120339	332	139470	4711	24898	0	29609
56	9867	96774	0	106641	8484	22240	0	30724
57	7412	82955	498	90865	2432	18786	0	21218
58	4014	67003	664	71681	3715	19703	0	23417
59	6713	59150	0	65862	1297	12052	0	13349
60	2395	47141	332	49868	1393	11259	0	12653
61	2190	26438	332	28960	314	10439	0	10753
62	856	25769	0	26625	1320	4945	0	6265
63	1230	20075	166	21471	0	4663	0	4663
64	1187	14727	332	16245	2157	3226	0	5383

65	1495	9457	0	10952	2068	1795	0	3863
66	0	8145	0	8145	2354	2025	0	4379
67	0	10201	0	10201	0	1138	0	1138
68	675	4641	0	5316	286	1952	0	2238
69	267	6603	0	6870	239	824	0	1063
70	267	3109	0	3375	286	3149	0	3435
71	267	1275	0	1542	598	896	0	1495
72	267	1809	0	2076	1918	818	0	2736
73	0	2187	0	2187	0	714	0	714
74	0	50	0	50	598	0	0	598
75	0	0	0	0	0	0	0	0
76	0	1995	0	1995	0	0	0	0
77	267	729	0	995	0	566	0	566
78	800	680	0	1480	0	268	0	268
79	267	1235	0	1502	0	252	0	252
80	0	117	0	117	0	340	0	340
81	0	355	0	355	0	436	0	436
82	0	0	0	0	0	283	0	283
83	0	0	0	0	0	0	0	0
84	0	50	0	50	0	283	0	283
85	0	0	0	0	0	0	0	0
86	0	0	0	0	0	0	0	0
87	0	217	0	217	0	0	0	0
88	0	167	0	167	0	0	0	0
89	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0
91	0	0	0	0	0	268	0	268
92	0	0	0	0	0	0	0	0
93	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0
97	0	0	0	0	0	0	0	0
98				0				0
99				0				0
Total	472591	1732233	26423	2231247	107116	365312	0	472428
Samples				76				15
Ind. Sampled				9428				1674
Catch (tons)				2642				556

Table 18 (cont.). Greenland halibut Spanish catches length distribution for Div. 3N and 30.

Length (cm)	Division 3N					Division 30			
	Males	Females	Ind.	Total		Males	Females	Ind.	Total
19	0	0	0	0		0	0	0	0
20	0	0	0	0		0	0	0	0
21	0	0	0	0		0	0	0	0
22	0	0	0	0		0	0	0	0
23	0	0	0	0		0	0	0	0
24	0	0	0	0		0	215	0	215
25	0	0	0	0		0	0	0	0
26	0	464	0	464		0	0	0	0
27	464	0	0	464		0	0	0	0
28	0	0	0	0		0	215	0	215
29	578	136	0	715		0	0	0	0
30	484	317	0	802		0	215	0	215
31	0	789	0	789		0	430	0	430
32	0	170	0	170		0	0	0	0
33	818	2343	0	3161		0	0	0	0
34	1056	1713	0	2769		0	0	0	0
35	928	1095	0	2023		0	0	0	0
36	1323	2391	0	3714		0	0	0	0
37	2750	2357	0	5106		0	215	0	215
38	2351	4248	0	6599		0	0	0	0
39	2086	6073	0	8158		0	0	0	0
40	2577	5933	0	8510		0	0	0	0
41	3958	9734	0	13692		0	0	0	0
42	2992	11034	0	14026		0	0	0	0
43	6746	10494	0	17240		0	0	0	0
44	4291	18059	0	22350		0	0	0	0
45	7922	18145	0	26067		0	0	0	0
46	5994	21594	0	27588		0	0	0	0
47	8423	27193	0	35616		0	215	0	215
48	9839	32512	0	42351		0	215	0	215
49	7015	32032	0	39047		0	0	0	0
50	9387	45209	0	54596	215	0	0	215	
51	8008	48644	0	56652	0	1075	0	1075	
52	7197	45555	0	52752	0	860	0	860	
53	5689	45318	0	51007	0	1075	0	1075	
54	3991	38657	0	42648	0	430	0	430	
55	3501	38621	0	42122	0	1075	0	1075	
56	3365	43983	0	47348	0	1290	0	1290	
57	2315	29088	0	31403	0	215	0	215	
58	1615	26969	0	28585	0	860	0	860	
59	601	23020	0	23621	0	215	0	215	
60	321	14977	0	15297	0	215	0	215	
61	232	7544	0	7776	0	430	0	430	
62	655	9737	0	10392	0	0	0	0	
63	0	7160	0	7160	0	0	0	0	
64	250	5661	0	5912	0	215	0	215	
65	0	5638	0	5638	0	0	0	0	

66	0	3956	0	3956	0	0	0	0
67	0	2435	0	2435	0	0	0	0
68	0	1832	0	1832	0	0	0	0
69	225	1646	0	1870	0	0	0	0
70	0	2511	0	2511	0	0	0	0
71	0	1046	0	1046	0	0	0	0
72	0	915	0	915	0	0	0	0
73	0	687	0	687	0	0	0	0
74	0	185	0	185	0	0	0	0
75	0	231	0	231	0	0	0	0
76	0	479	0	479	0	0	0	0
77	0	678	0	678	0	0	0	0
78	0	211	0	211	0	0	0	0
79	0	0	0	0	0	0	0	0
80	0	185	0	185	0	0	0	0
81	0	0	0	0	0	0	0	0
82	0	168	0	168	0	0	0	0
83	185	211	0	396	0	0	0	0
84	0	0	0	0	0	0	0	0
85	0	0	0	0	0	0	0	0
86	0	185	0	185	0	0	0	0
87	0	0	0	0	0	0	0	0
88	0	0	0	0	0	0	0	0
89	0	0	0	0	0	0	0	0
90	0	0	0	0	0	0	0	0
91	0	0	0	0	0	0	0	0
92	0	167	0	167	0	0	0	0
93	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0
95	0	0	0	0	0	0	0	0
96	0	0	0	0	0	0	0	0
97	0	136	0	136	0	0	0	0
98				0				0
99				0				0
Total	120133	662471	0	782604	215	9672	0	9887
Samples				27				2
Ind Sampled				3759				46
Catch (tons)				871				13

Table 18 (cont.). Greenland halibut Spanish catches length distribution for Div. 3LMNO.

Length (cm)	Division 3LMNO			
	Males	Females	Indter.	Total
19	0	3	0	3
20	5	0	0	5
21	5	0	0	5
22	271	0	0	271
23	0	10	0	10
24	5	16	0	21
25	10	26	0	36
26	244	490	0	734
27	475	249	0	724
28	152	3	0	155
29	921	141	0	1062
30	1199	818	332	2350
31	614	2230	332	3176
32	1818	2245	166	4228
33	1660	5116	498	7274
34	2136	3549	664	6349
35	2313	2613	332	5259
36	4618	6908	498	12024
37	5836	10680	498	17014
38	6531	14353	1162	22047
39	8991	24738	498	34228
40	12590	27501	996	41088
41	16431	30436	1162	48030
42	16667	37360	1494	55522
43	27047	46242	664	73954
44	27855	55805	498	84159
45	38377	66494	1162	106033
46	41074	92398	830	134302
47	38713	107720	1494	147928
48	56495	131088	1661	189243
49	57357	134519	1515	193391
50	56237	181984	2159	240380
51	53079	174472	1328	228879
52	46692	207370	2325	256387
53	37506	197988	996	236490
54	29246	202574	498	232319
55	27010	183858	332	211201
56	21716	162998	0	184714
57	12159	130829	498	143486
58	9344	113675	664	123683
59	8611	94221	0	102832
60	4109	73377	332	77818
61	2736	44421	332	47489
62	2831	40451	0	43282
63	1230	31898	166	33294
64	3594	23614	332	27540
65	3563	16890	0	20453

66	2354	14126	0	16480
67	0	13774	0	13774
68	961	8425	0	9386
69	730	9073	0	9803
70	553	8768	0	9321
71	865	3217	0	4082
72	2185	3542	0	5727
73	0	3589	0	3589
74	598	235	0	833
75	0	231	0	231
76	0	2474	0	2474
77	267	1973	0	2239
78	800	1159	0	1959
79	267	1487	0	1754
80	0	642	0	642
81	0	791	0	791
82	0	451	0	451
83	185	211	0	396
84	0	333	0	333
85	0	0	0	0
86	0	185	0	185
87	0	217	0	217
88	0	167	0	167
89	0	0	0	0
90	0	0	0	0
91	0	268	0	268
92	0	167	0	167
93	0	0	0	0
94	0	0	0	0
95	0	0	0	0
96	0	0	0	0
97	0	136	0	136
98	0	0	0	0
99	0	0	0	0
Total	699840	2760016	26423	3486280

Samples	120
Ind Sampled	14907
Catch (tons)	4082
SOP	0.95

Table 20. Skates Spanish catches length distribution by sex for Div. 3LNO.

Skates Length (cm)	3LNO			Total
	Males	Females	Ind.	
14	0	0	0	0
15	0	0	0	0
16	0	237	237	475
17	0	0	0	0
18	0	0	0	0
19	237	0	237	475
20	0	475	475	949
21	237	0	237	475
22	1238	712	1949	3899
23	475	0	475	949
24	1289	2578	3866	7733
25	2784	2939	4815	10538
26	2751	4989	7495	15236
27	4206	3387	7072	14665
28	4300	4815	8733	17848
29	6238	6036	10073	22348
30	3660	5232	6918	15810
31	10674	4909	10990	26572
32	9113	7836	11073	28022
33	9577	5525	9124	24226
34	9771	7632	4681	22084
35	9181	9265	3155	21601
36	9579	9799	1815	21193
37	11808	10215	763	22785
38	10675	9187	1526	21388
39	15366	11440	1289	28096
40	21430	12488	1052	34969
41	20496	15336	1577	37409
42	19839	20748	1289	41876
43	19069	18364	526	37959
44	17386	18938	1577	37901
45	22527	22024	0	44550
46	18957	20078	2103	41138
47	18968	15021	1052	35040
48	18069	16786	1052	35907
49	14601	16589	1052	32241
50	19008	21024	0	40032
51	18802	18766	0	37568
52	14746	14037	475	29258
53	14418	22724	526	37668
54	18064	15243	526	33833
55	18523	24875	0	43398
56	17409	14298	0	31707
57	17205	24718	0	41922
58	20525	20739	0	41263
59	9114	15965	0	25080
60	12011	15201	237	27449

61	15012	15066	237	30315
62	17104	20123	0	37227
63	11694	13280	0	24974
64	9097	15256	237	24590
65	8847	13691	0	22538
66	13170	10408	0	23578
67	10420	12791	237	23448
68	10208	14433	475	25116
69	8932	11302	237	20472
70	9124	10498	475	20097
71	11252	7372	475	19098
72	9054	10271	237	19562
73	14171	9729	0	23901
74	11507	8587	712	20805
75	15324	5849	237	21410
76	8959	3902	237	13099
77	14305	3295	237	17837
78	13811	2646	0	16457
79	12578	3816	237	16631
80	12796	2033	237	15066
81	14866	855	0	15721
82	11588	2490	0	14078
83	8029	864	0	8894
84	7979	65	0	8044
85	8575	1790	0	10366
86	7196	206	0	7402
87	4370	0	0	4370
88	4564	0	0	4564
89	2316	123	0	2438
90	2137	0	0	2137
91	1902	0	0	1902
92	250	0	0	250
93	1348	65	0	1412
94	151	0	0	151
95	148	0	0	148
96	167	0	0	167
97	1098	0	0	1098
98	0	0	0	0
99	0	0	0	0
100	0	0	0	0
101	1098	0	0	1098
Total	809473	691975	114548	1615996

Samples	57
Ind. Sampled	5569
Catch (ton)	2819
SOP	0.94

Table 21. Roughhead grenadier Spanish catches length distribution measured as preanal fin lengths (AFL) for Divisions 3LMNO.

Roughhead G. Length (cm)	3LMNO			Total
	Males	Females	Ind.	
5	0	0	5	5
6	0	5	0	5
7	7	13	0	20
8	25	25	80	130
9	517	239	116	872
10	529	219	1309	2058
11	999	449	1294	2743
12	1042	932	1785	3759
13	2442	869	3322	6633
14	3091	1708	3274	8073
15	3554	1987	5620	11161
16	3942	2292	4866	11100
17	4286	1664	4764	10714
18	3477	1759	5975	11211
19	2409	1891	5284	9584
20	1285	1807	3664	6755
21	405	1662	4622	6689
22	139	1457	3557	5153
23	46	1298	3716	5059
24	6	1091	2076	3173
25	10	876	1805	2691
26	0	596	1513	2109
27	0	395	1299	1694
28	5	274	494	773
29	0	313	228	541
30	0	305	216	521
31	0	128	0	128
32	0	104	0	104
33	0	67	8	75
34	0	83	0	83
35	0	41	8	49
36	0	12	0	12
37	0	0	0	0
38	0	85	0	85
39	0	3	0	3
40	0	0	0	0
Total	28217	24562	60898	113677
Samples				44
Ind. Sampled				4442
Catch (tons)				67
SOP				0.96

Table 22. Roughhead grenadier Div. 3LMNO Spanish catches distribution, mean weight (g) and mean length (AFL cm) by age.

Age	Abundance				Age	Mean Weight (g)			
	Males	Females	Ind.	Total		Males	Females	Ind.	Total
1	0	0	0	0	1				
2	3	11	5	20	2	42	36	17	33
3	158	271	126	555	3	78	79	68	76
4	1962	838	2841	5641	4	127	141	132	132
5	3381	1526	4420	9328	5	225	215	218	220
6	5245	3191	7409	15846	6	289	303	297	296
7	3106	2522	4934	10563	7	396	381	390	390
8	5272	2856	7240	15369	8	442	510	475	470
9	3402	2451	6106	11959	9	512	575	555	547
10	3614	1741	6377	11732	10	585	712	657	643
11	1089	2405	6344	9839	11	691	891	867	854
12	621	2131	5594	8346	12	721	1033	987	979
13	333	1687	4208	6228	13	800	1168	1148	1135
14	23	1124	2871	4018	14	1146	1410	1342	1360
15	5	690	1284	1979	15	1314	1741	1553	1618
16	2	574	715	1291	16	1609	2125	1653	1863
17	1	394	306	701	17	1559	2653	1807	2283
18	0	91	52	144	18	1861	2549	2044	2363
19	0	39	28	68	19		2053	2053	2053
20	0	104	37	141	20		2814	2373	2698
21	0	0	0	0	21				
22	0	0	0	0	22				
23	0	0	0	0	23				
24	0	0	0	0	24				
Age	Mean Length (cm)				Age	Mean Length (cm)			
	Males	Females	Ind.	Total		Males	Females	Ind.	Total
1					1				
2	7.5	7.1	5.5	6.8	2				
3	9.3	9.4	8.9	9.2	3				
4	11.0	11.4	11.2	11.2	4				
5	13.5	13.3	13.3	13.4	5				
6	14.7	15.0	14.9	14.9	6				
7	16.5	16.3	16.4	16.4	7				
8	17.1	18.0	17.5	17.5	8				
9	18.0	18.8	18.6	18.4	9				
10	18.9	20.3	19.7	19.5	10				
11	20.0	21.9	21.7	21.6	11				
12	20.4	23.1	22.7	22.6	12				
13	21.1	24.0	23.9	23.8	13				
14	23.9	25.7	25.3	25.4	14				
15	25.0	27.6	26.6	27.0	15				
16	27.0	29.6	27.3	28.3	16				
17	26.7	31.8	28.1	30.2	17				
18	28.5	31.7	29.4	30.9	18				
19		29.5	29.5	29.5	19				
20		32.7	30.9	32.2	20				
21					21				
22					22				
23					23				
24					24				

Table 23. White hake Spanish catches length distribution by sex for Div. 3NO.

White hake Length (cm)	3NO		Ind.	Total
	Males	Females		
15	1080	0		1080
16	0	0		0
17	11884	2161		14045
18	11884	8643		20527
19	14045	11884		25929
20	16205	16205		32411
21	5402	14045		19447
22	7563	21607		29170
23	0	0		0
24	0	0		0
25	0	0		0
26	0	0		0
27	0	0		0
28	0	0		0
29	0	0		0
30	0	0		0
31	0	0		0
32	0	0		0
33	0	0		0
34	0	108		108
35	0	0		0
36	0	0		0
37	0	0		0
38	108	108		216
39	432	0		432
40	108	0		108
41	649	216		865
42	216	0		216
43	865	216		1081
44	649	108		757
45	216	324		541
46	324	0		324
47	108	757		865
48	0	324		324
49	2139	324		2463
50	324	0		324
51	108	324		432
52	324	324		649
53	108	541		649
54	108	324		432
55	0	0		0
56	108	108		216
57	1923	216		2139
58	108	216		324
59	324	216		541
60	108	0		108
61	1923	0		1923

62	0	0	0
63	108	0	108
64	0	108	108
65	216	0	216
66	0	0	0
67	0	0	0
68	0	1815	1815
69	0	1599	1599
70	0	0	0
71	0	0	0
72	0	0	0
73	0	0	0
74	0	108	108
75	0	0	0
76	0	0	0
77	0	108	108
78	0	3197	3197
79	0	0	0
80	0	1599	1599
81	0	1707	1707
Total	79669	89541	0 169210

Samples	3
Ind. Sampled	254
Catch (ton)	78
SOP	1.23

Table 24. Greenland halibut Spanish 2015 catches total Age Length key (ALK).

Length	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
19	2																			2	
20																					0
21	3																				3
22	4																				4
23	1	2																			3
24	4	1																			5
25		7																			7
26		2																			2
27	1	7	1																		9
28		8	4																		12
29		8	6																		14
30		2	8																		10
31		4	10																		14
32			7																		7
33			6	2																	8
34			6	4																	10
35			7	5																	12
36			3	11																	14
37			3	20	2																25
38			3	16																	19
39			1	17	4																22
40			1	14	6																21
41				17	11																28
42				13	20																33
43				12	21	1															34
44				3	26																29
45				2	23	1															26
46				1	28	6															35
47				1	24	9															34
48					18	15															33
49					16	21															37
50					7	31	2														40
51					2	32	3														37
52					5	25	7	1													38
53						35	6	2													43
54						19	16	1													36
55						16	12	4	1												33
56						14	10	7	1												32
57						7	13	10													30
58						9	12	5	2												28
59						4	8	10	11												33
60							8	16	2	1											27
61							5	14	2												21
62							1	13	4	1											19
63							1	8	6	5	1	1									22
64								7	4	3		1									15
65								3	5	3	1	1	1								14
66								2	1	4	4	1									12
67									4	3	5										12
68									1	3	3	1	1								9
69									2	2	4		1	1							10
70										1	4	2	2	1							10
71										2	1	1		1							5
72											2	1	1								4
73												1	1								2
74													1	2							3
75																					0
76													1	3	4		1				9
77													1								1
78													1	1	1	1					4
79														1	2				1		4
80																		2			2
81															2		1		1		4
82															1	1					2
83															1	2					3
84														1	1						2
85																	2				2
86																	2				2
87																	1		1		2
88																	1		2		3
89																					0
90																					0
91																			2	1	3
92																		1			1
93																					0
94																					0
95																					0
96																				1	0
97																					1
98																					0
99																					0
100																					0
Total	15	41	66	138	213	245	89	55	78	31	28	26	13	15	15	10	2	8	2	1092	



Table 24. (Cont.) Greenland halibut Spanish 2015 catches males Age Length key (ALK).

Length	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
19																					0
20																					0
21	1																				1
22	3																				3
23	1																				1
24	1																				1
25		5																			5
26		1																			1
27	1	3	1																		5
28		3	2																		5
29		4	4																		8
30			4																		4
31		1	4																		5
32			4																		4
33			5	1																	6
34			2	3																	5
35			2	4																	6
36			2	4																	6
37			2	5	2																9
38			3	5																	8
39			1	5	2																8
40				5	1																6
41				4	6																10
42				7	10																17
43				6	10	1															17
44				2	11																13
45				1	11	1															13
46					11	4															15
47					12	2															14
48					11	4															15
49					11	9															20
50					3	10	2														15
51						14															14
52					3	11	1														15
53						12	2	1													15
54						6	8														14
55						4	3	2													9
56						4	3	2													9
57						2	4	3													9
58						2	1	2													5
59						1	2	3	1												7
60								1	2	1											4
61									1												1
62									1												1
63									2	1	2										5
64									1	1	1										3
65																					0
66																					0
67																					0
68																					0
69																					0
70																					0
71											1										1
72																					0
73																					0
74																					0
75																					0
76																					0
77																					0
78																					0
79																					0
80																					0
81																					0
82																					0
83																					0
84																					0
85																					0
86																					0
87																					0
88																					0
89																					0
90																					0
91																					0
92																					0
93																					0
94																					0
95																					0
96																					0
97																					0
98																					0
99																					0
100																					0
Total	7	17	36	52	104	87	26	14	8	3	4	0	0	0	0	0	0	0	0	0	358



Table 24. (Cont.) Greenland halibut Spanish 2015 catches females Age Length key (ALK).

Length	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total	
19	2																			2	
20																					0
21	2																				2
22	1																				1
23		2																			2
24	3	1																			4
25		2																			2
26		1																			1
27		4																			4
28		5	2																		7
29		4	2																		6
30		2	4																		6
31		3	6																		9
32			3																		3
33			1	1																	2
34			4	1																	5
35			5	1																	6
36			1	7																	8
37			1	15																	16
38				11																	11
39				12	2																14
40			1	9	5																15
41				13	5																18
42				6	10																16
43				6	11																17
44				1	15																16
45				1	12																13
46				1	17	2															20
47				1	12	7															20
48					7	11															18
49					5	12															17
50					4	21															25
51					2	18	3														23
52					2	14	6	1													23
53						23	4	1													28
54						13	8	1													22
55						12	9	2	1												24
56						10	7	5	1												23
57						5	9	7													21
58						7	11	3	2												23
59						3	6	7	10												26
60							7	14	1	1											23
61							5	13	2												20
62							1	12	4	1											18
63								1	6	5	3	1	1								17
64									6	3	2		1								12
65									3	5	3	1	1	1							14
66									2	1	4	4	1								12
67										4	3	5									12
68										1	3	3	1	1							9
69										2	2	4	1	1	1						10
70											1	4	2	2	1						10
71											1	1	1		1						4
72												2	1	1							4
73												1		1							2
74													1	2							3
75																					0
76														1	3	4		1			9
77														1							1
78														1	1	1	1				4
79															1	2			1		4
80																		2			2
81																	2		1	1	4
82																1	1				2
83																1	2				3
84															1	1					2
85																	2				2
86																	2				2
87																	1			1	2
88																	1		2	1	3
89																					0
90																					0
91																			2		3
92																			1		1
93																					0
94																					0
95																					0
96																					0
97																				1	1
98																					0
99																					0
100																					0
Total	8	24	30	86	109	158	63	41	70	28	24	26	13	15	15	10	2	8	4	734	



Table 25. Roughhead grenadier Spanish 2015 Commercial and FC Total Age Length key (ALK).

AFL Length cm	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
8	2																		2
9	2	3																	5
10		18	1																19
11		17	3																20
12		7	18	4															29
13			25	13															38
14			10	31	5														46
15			1	22	9	5													37
16				3	15	15	6	1											40
17				1	11	20	7	3											42
18					1	11	19	11	1										43
19						4	12	17	8	3									44
20						3	3	11	5	4	3								29
21							1	7	17	8	5								38
22									9	11	3	1							24
23									6	6	7	7	2						28
24								1	4	8	5	2							20
25										4	6	6	1	2	1				20
26										2	6	7	5	2					22
27											5	5	5	3	1				19
28											1	5	4	3	1	1			15
29												2	1	2	1		1	1	8
30													5	2	5	1			13
31													1	1					2
32														1	2	1		1	5
33														1	1	1			3
34														1					1
35																		3	3
36															1	1			2
37																		2	2
38															1				1
Total	4	45	58	74	41	58	48	51	50	46	41	35	24	18	14	5	1	7	620

Table 25. (Cont.) Roughhead grenadier Spanish 2015 Commercial and FC males Age Length key (ALK).

AFL Length cm	3	4	5	6	7	8	9	10	11	12	13	14	Total
8	2												2
9	1	3											4
10		11	1										12
11		12	3										15
12		5	10	3									18
13			18	8									26
14			6	18	2								26
15			1	13	4	5							23
16				1	8	8	5	1					23
17					4	12	4	3					23
18					1	6	9	9	1				26
19						1	5	12	6	3			27
20							1	6	2	3	2		14
21							1	1	3		2		7
22										1			1
23									1	1		3	5
Total	3	31	39	43	19	32	25	32	13	8	4	3	252

Table 25. (Cont.) Roughhead grenadier Spanish 2015 Commercial and FC females Age Length key (ALK).

AFL Length cm	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	Total
9	1																		1
10		7																	7
11		5																	5
12		2	8	1															11
13			7	5															12
14			4	13	3														20
15				9	5														14
16				2	7	7	1												17
17				1	7	8	3												19
18						5	10	2											17
19						3	7	5	2										17
20						3	2	5	3	1	1								15
21								6	14	8	3								31
22									9	10	3	1							23
23									5	5	7	4	2						23
24								1	4	8	5	2							20
25										4	6	6	1	2	1				20
26										2	6	7	5	2					22
27											5	5	5	3	1				19
28											1	5	4	3	1	1			15
29												2	1	2	1		1	1	8
30													5	2	5	1			13
31													1	1					2
32														1	2	1		1	5
33														1	1	1			3
34														1					1
35																		3	3
36															1	1			2
37																		2	2
38															1				1
Total	1	14	19	31	22	26	23	19	37	38	37	32	24	18	14	5	1	7	368

Table 26. Splendid alfonsino Spanish catches length distribution for Div. 6G.

Splendid alfonsino Length (cm)	6G		Ind.	Total
	Males	Females		
25				0
26				0
27	11	0		11
28	11	0		11
29	0	0		0
30	83	58		141
31	0	0		0
32	590	179		769
33	778	784		1562
34	1305	531		1835
35	3186	926		4112
36	7177	3363		10540
37	9909	5131		15040
38	11777	7367		19144
39	13619	8845		22464
40	12277	9510		21788
41	11151	10520		21671
42	6524	7266		13790
43	4817	6016		10832
44	2796	4735		7531
45	1402	2464		3866
46	605	1479		2084
47	152	683		835
48	188	519		707
49	135	220		355
50	23	89		112
51	23	38		60
52	0	59		59
53	0	84		84
54	0	13		13
55				0
Total	88536	70879	0	159416
Samples				29
Ind. Sampled				4465
Catch (tons)				127
SOP				1.11

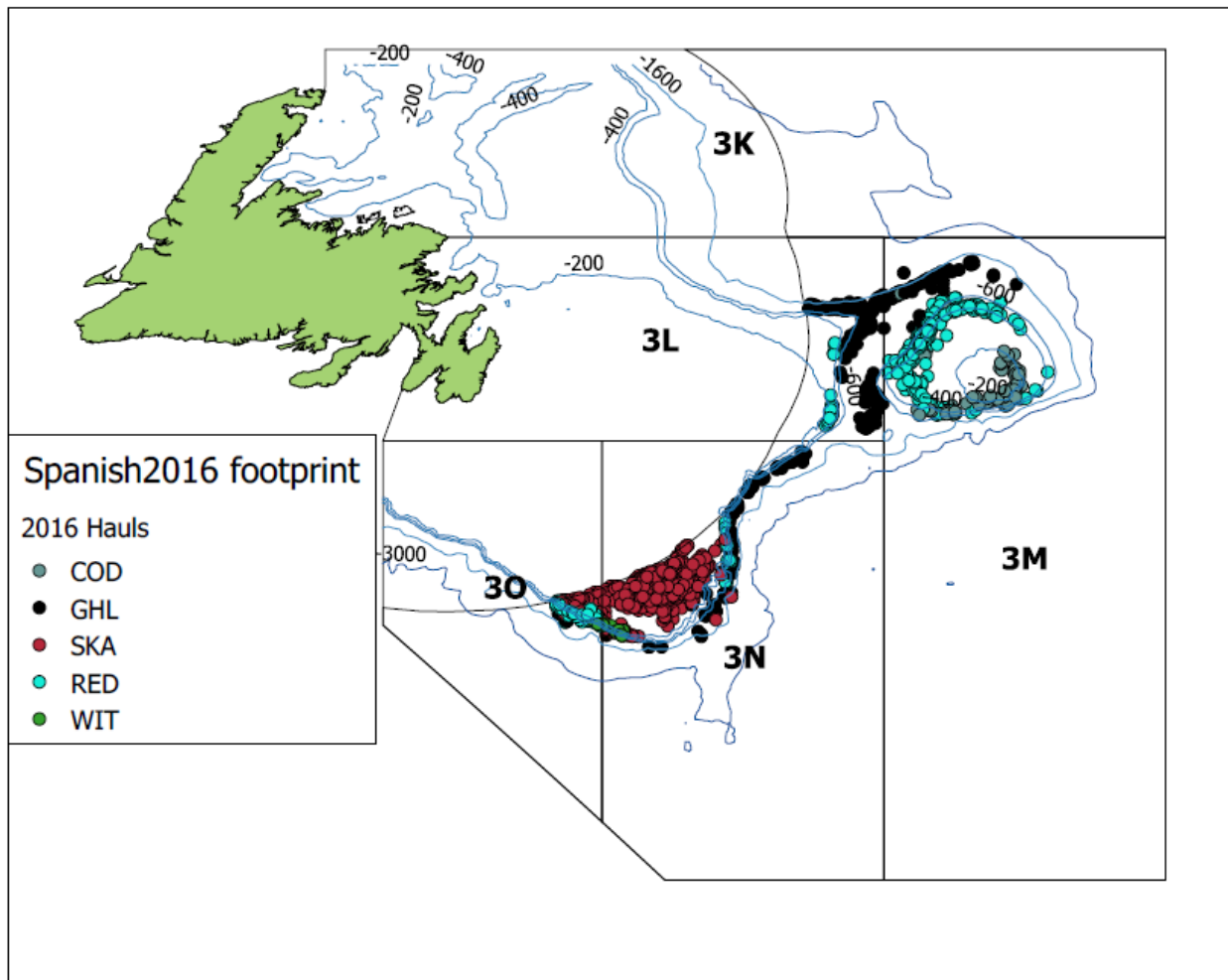


Fig. 1. Spanish Fishery 2016 footprint based in NAFO Observers data.

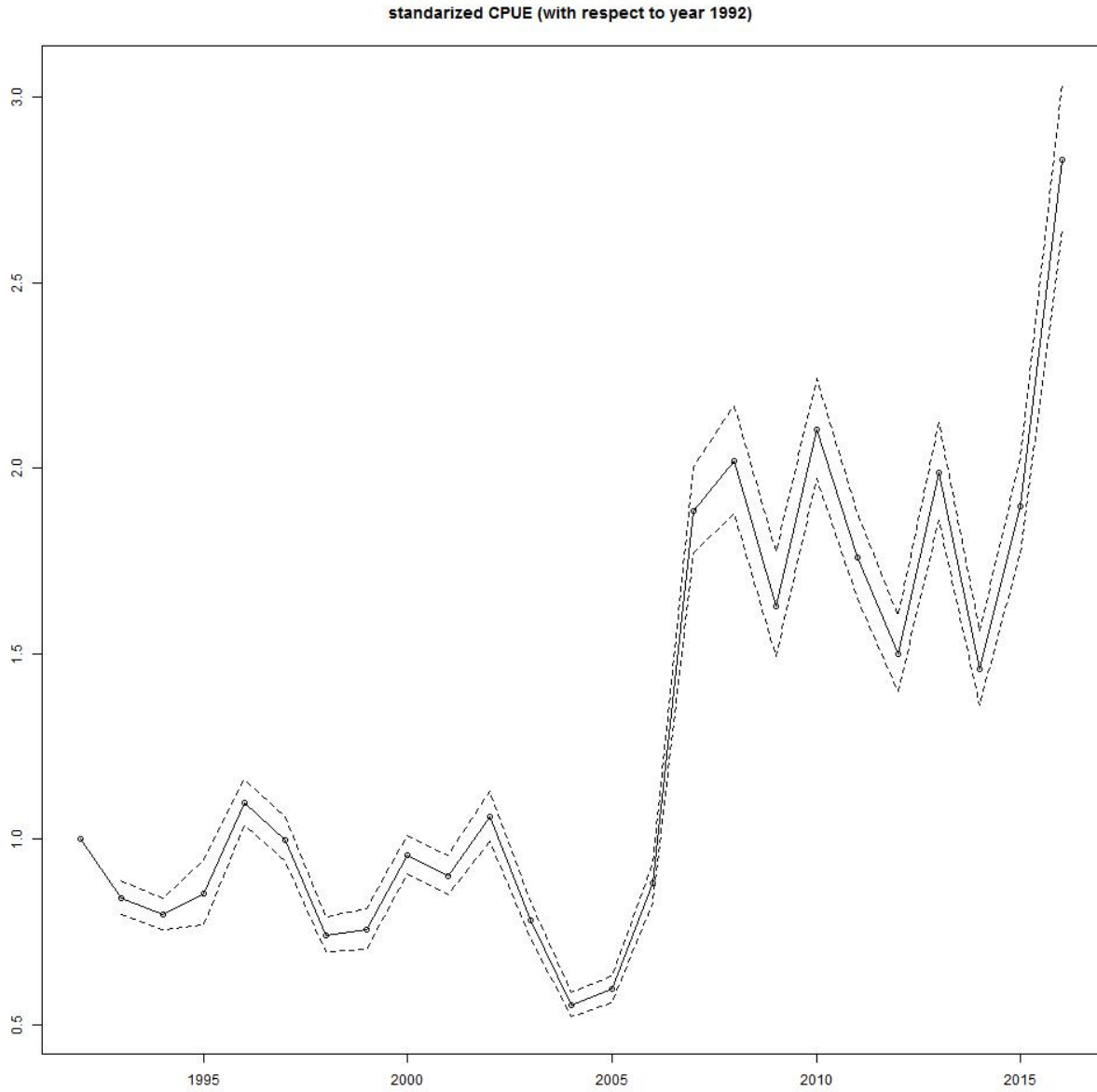


Fig. 2. Spanish fleet standardized CPUE with model presented by Gonzalez-Costas and Gonzalez-Troncoso (2009) update with the 2016 data.