

**SCIENTIFIC COUNCIL MEETING – JUNE 2020****Spanish Research Report for 2019**

by

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Spanish catch and effort information used in this Report is based on the preliminary logbook data contributed by the Spanish Administration. The logbooks information for 2019 was available haul by haul. Table 1 presents the preliminary Spanish catches by species and Division in 2019 in NAFO Regulatory Area. Total effort of the Spanish fleet in 2019 was 1,272 fishing days.

In 2019, IEO scientific observers were on board 257 fishing days that it means 20 % 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. In 2019, 376 samples were taken with 45,831 individuals of different species examined (Table 2).

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

A total of 10 Spanish trawlers operated in Div. 3LMNO NAFO Regulatory Area (NRA) during 2019, amounting to 1,264 days (18,686 hours) of fishing effort. Table 3 presents the Spanish effort (fishing hours) since 2003 in NRA Subarea 3. Total catches (Table 1) for all species combined in Div. 3LMNO were 16,124 tons.

Table 4 shows the effort (hours) by quarter and Division. This year it has not been possible to analyze the distribution by depth strata due to the lack of depth information in many records of the Logbooks. Table 5 presents the effort by Division, quarter and mesh size.

These effort tables 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: 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 3O 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 Division 3M at depth between 150-550 meters targeting cod with 130 mm mesh size gear.

Effort and fisheries by Division. Based on the information on the distribution of the effort by depth of previous years and on the information presented in tables 4 and 5 with 2019 data, it was possible to conclude the following: In Div. 3L, most of the effort was performed at more than 600 meters depth using cod-end mesh size of 130 mm, indicating that the fleet targeted Greenland halibut. Regarding Div. 3M, part of effort was carried out using 130 mm cod-end mesh size at less than 600 m depth targeting redfish and cod and the other part at depths more than 600 m targeting Greenland halibut. In Div. 3N, the effort carried out using 280 mm was the 56% and with 135 mm cod-end mesh size was 44%, which indicates that the fleet targeted mainly skate in



depth less than 200 m., redfish in 200-600 meters depth and Greenland halibut in depth more than 600 m. Fishing effort in Div. 30 was around the 20% of the 3LMNO total effort targeting skates using mainly 280 mm mesh size in depth less than 200 meters and redfish in depth between 200-600 meters using 135 mm mesh size. To remark that in 2018 and 2019 there was a directed fishery targeted squid in Div. 30, mainly during the third quarter in 400-100 meters depth with a 60 mm mesh size trawl gear.

In addition to NAFO observers (NAFO Observers Program), 7 IEO scientific observers were onboard Spanish vessels, comprising a total of 257 observed fishing days, around 20% 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 2019, 376 length samples were taken, with 45,831 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 by the IEO scientific observers and the European Union surveys information carried out in 2019 in the NAFO Regulatory Area (NRA).

The Spanish activity en the NRA Subarea 3 in 2019, stock by stock, was the following:

Cod (*Gadus morhua*)

Div. 3L: In Div. 3L, the few catches of this species (1 tons) were taken as by-catch in the redfish fishery. There were no sample length distributions of this species in this Division.

Div. 3NO: The most important part of the catches of this species was taken as by-catch in the skate fishery with 280 mm mesh size (106 tons) and in less degree in fisheries with 130 mm mesh size (39 tons). Table 7 shows the catch length distribution for Div. 3NO cod. Note that these catches length distributions are based on only two samplings and that they may not be representative of the real catches length distributions. The size distributions present two maximum around 41 and 48 cm and most of the exemplars are in the 35-57 cm range.

Div. 3M: Catches in Div. 3M were 2296 tons and most of them were taken in the direct fishery. In 2019 only trawlers operated in this fishery. A small part of the catches were taken as by catch of the redfish fishery. The legal mesh size of the Cod fishery is 130 mm and the minimum landing size (MLZ) 41 cm. The total length distributions of the Spanish catches are presented in Table 8. We can observe that most of the catches length distributions are in the 55-74 cm range. The mode in 2019 was 64 cm. Highlight that practically all the captured specimens are larger than MLZ (41 cm).

Redfish (*Sebastes mentella* and *Sebastes fasciatus*)

3M: In Div. 3M the redfish catches in 2019 have been 1966 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 9 shows the Spanish catches length distribution for redfish Division 3M and it can be observed that the bulk of the catches are in the 26-35 cm range, quite similar to the range observed in previous years. This length distribution of catches in Div. 3M are bigger than the observed in Div 30 and Div 3LN.

Div. 3LN: Spanish catches were 518 tons. Most of the catches were taken in a direct fishery for this stock. Table 10 shows the Spanish catches length distribution for redfish Division 3LN and it can be observed that the bulk of the catches are in the 22-28 cm range.

Div. 30: A directed fishery for this species took place in Div. 30. Catches have reached 1910 tons in this Division, most of them with 130 mm mesh size. Catches length distribution for Div. 30 are presented in Table 11 and it can be observed that are very similar to those observed in Div. 3LN and smaller (21-27 cm) than the observed in Div. 3M.

American plaice (*Hippoglossoides platessoides*)

Div. 3LNO: Spanish catches in 2019 in Div. 3LNO were 226 tons. Most of the catches were taken with 280 mm mesh size (163 tons) as by-catch of the skate fishery and in less degree with 130 mm mesh size (63 tons). Table 12 presents the total length distribution for Div. 3LNO. Note that these catches length distributions are based

on only three samplings and that they may not be representative of the real catches length distributions. Length distributions with 280 mm mesh size have a bigger length range than the 130 mm mesh size. It can be observed a clear different length between sexes, females reach larger sizes than males. The bulk of catches were in the range of 30-48 cm.

Div. 3M: Catches in Div. 3M only amounted 27 tons and most of them were taken as by-catch of the cod and redfish fisheries. Table 13 presents the total length distribution for Div. 3M. As observed in the 3LNO stock, it can be observed a clear different length between sexes, females reach larger sizes than males. The bulk of catches were in the range of 38-50 cm.

Witch flounder (*Glyptocephalus cynoglossus*)

Div. 2J and 3KL: Spanish catches for this stock in 2019 were 17 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. In 2019, there were no available sample length distributions of this species in this Division.

Div. 3M: There is not management stock for this species in this Division. Catches this year were 77 tons. This species in this Division was taken as by-catch in the Cod and redfish fishery. Table 14 shows the total Spanish length distribution for this stock. The bulk of catches were in the range of 39-43 cm. Females reach larger sizes than males.

Div. 3NO: Spanish catches for this stock in 2019 were 60 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 (52 tons) and in less degree in the skate fishery (8 tons) with 280 mm cod end gear. Table 15 shows the total Spanish length distribution for this species. The bulk of catches were in the range of 38-49 cm. Females reach larger sizes than males.

Yellowtail flounder (*Limanda ferruginea*)

Div. 3LNO: In 2019 the yellowtail flounder Spanish catches were 274 tons. Most of the catches were taken in Div. 3NO in the skate fishery (263 tons) as by-catch. Length distributions for yellowtail flounder in Div. 3LNO are presented in Table 16. It should be noted that there were no length samples of the catches (11 ton) made with 130 mm mesh size. Most of the catches are in the 30-43 cm length range. Females reach larger sizes than males.

Greenland halibut (*Reinhardtius hippoglossoides*)

Subareas 2 and Div. 3KLMNO: Greenland halibut continues to be one of the main target species for the Spanish fleet in NAFO area. In 2019 Spanish catches were 4,474 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 17 shows the length distributions of Spanish catches by Division (3L, 3M, 3N and 3O) and the total length distributions of Spanish catches in Divisions 3KLMNO. Most of the catches were in the 34-63 cm length range and the mode of the length distribution was in 45-52 cm. Total age composition based in the commercial Spanish Age Length Key (Table 23), mean weight and mean length at age for Div. 3KLMNO are presented in Table 18. Most of the Greenland halibut catches corresponds to ages 5 to 10 with a peak at ages 6-7. This age catch age distribution is similar to the last years.

Figure 1 presents the Spanish fleet standardised CPUE updated with the 2019 data presented by Gonzalez-Costas and Gonzalez-Troncoso (2009). It can be observed different periods with different CPUE levels: The first period between 1992-2003 with relative CPUE values around 1; a second period (2007-2015) with values in the region of 2; a third period (2016-2017) with values about 2.5 and the most recent period (2018-2019) with values similar to those observed between 2007-2015.

Thorny skate (*Amblyraja radiata*)

Commercial catches of skates comprise a mix of skate species (*Amblyraja radiata*, *Bathyrāja 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 based on 2014-2016 data from the EU Spanish 3NO Survey.

Div. 3LNO: Spanish 3LNO skate catches in 2019 were 3,114 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 (18 tons) were much smaller than those in Div. 3NO and they were by-catch of the Greenland halibut and redfish fisheries (130 mm cod-end). Table 19 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 41-75 cm length range, slightly lower range than in previous years. It can be observed a clear different length between sexes, males reach larger sizes than females.

Div. 3M: Skate catches in Div. 3M (16 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 (*Macrourus berglax*)

Subarea 2 and 3: Roughhead grenadier is the main species taken as by-catch in the Greenland halibut fishery. Most of the 2019 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 2019 were 82 tons. Table 20 shows the AFL length distributions, grouping in 1 cm intervals, of Spanish catches for Div. 3LMNO. Most of the catches were in the 12-21 AFL length range, with a mode in 15-16 cm and a clear length difference between sexes, males reach smaller sizes than females.

The commercial length / age keys normally presented in this document are not currently available due to problems with COVID19. It is expected to be able to have these keys throughout this year.

White hake (*Urophycis tenuis*)

Div. 3NO: Catches of this species in 2019 in Div 3NO (86 tons) were a small by-catch of different fisheries. In Division 3NO a small part of the catches (3 tons) were taken with the 280 mesh size. Catches in Div. 3NO take with 130 mm mesh size (81 tons) are by-catch of the redfish fishery. A small part of the catches (1.5 ton) were by catch of the squid fishery in Div. 3O with 60 mm. Mesh size. Table 21 shows the total catches length distributions by sex of Div. 3NO. It was only available one length distribution sample 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 39-58 cm length range.

Capelin (*Mallotus villosus*)

Div. 3NO: Catches of this species are occasional. In 2019 there is no record of capelin catches by the Spanish fleet.

Squid (*Illex illecebrosus*)

Div. 3NO: Catches of this species they have been occasional in the past as by-catch of different fisheries, but in the last two years there was a directed fishery to this species. In 2019 squid catches in Div 3NO by the Spanish fleet were 162 (ton). Of which 72 were carried out in a directed fishery in Div 3O with 60 mesh size and 90 tonnes were captured in Div. 3NO as a by-catch mainly from the redfish fishery. Table 22 shows the total catches length distribution of Div. 3NO. The mantle length of the individuals was measured to the half centimetre below. It was only available one length distribution sample with a small number of measured individuals. Due to this problem, this sample could not be very representative of the catches length distributions. Most of the catches were in the 16.5-19.5 mantle length range.

(B) Research studies

The Spanish bottom trawl survey in NAFO Regulatory Area Div. 3NO was conducted from 29th of May to the 26th of June 2019 on board the R/V Vizconde de Eza. The gear was a Campelen otter trawl with 20 mm mesh size in the cod-end. Following the method used last year, a total of 115 valid hauls were taken within a depth range of 43-1438 m according to a stratified random design and 100 hydrographic profiles. Furthermore, a stratified sampling by length class and sex was used to sample otoliths of Atlantic cod, American plaice and Greenland halibut for growth studies. Also, gonads of American plaice 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 2019, 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 August 3 to 23. 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 97 and 1 of them was null. 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 19/052. Samples for histological (American plaice and roughhead grenadier) and aging (Greenland halibut, American plaice, roughhead grenadier and cod) studies were taken. Ninety six hydrographic profile samplings were made in a depth range of 120-1403 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 29th to July 29th 2019. 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 183 and three of them were 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 a Scientific Council Research document. Flemish Cap survey results for Northern shrimp (*Pandalus borealis*) were presented in SCR 19/053. Samples for histological assessment of sexual maturity of cod, redfish, Greenland halibut and roughhead grenadier were taken. Oceanography studies continued to take place.

VME data from the 2019 UE (Spain and Portugal) bottom trawl groundfish surveys in NAFO Regulatory Area (Divs. 3LMNO):

New data on deep-water corals and sponges were analyzed from the 2019 EU (Spain and Portugal) bottom trawl groundfish surveys. The data was made available to the NAFO WGESA to improve mapping of Vulnerable Marine Ecosystem (VME) 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. 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

EU-Spain 2019 Data: Sponges were recorded in 100 of the 395 tows (25.3% of the total tows analyzed), with depths ranging between 156 - 1359 m. Significant catches of sponge (≥ 75 kg/tow) were found in three tows. Two of these catches were located in Flemish Pass area inside the KDE sponge polygon and inside closure area number 2. The third record was found besides closed area number 13 inside the KDE sponge polygon. Sponge catches for these tows ranged between 134.21 - 289.77 kg.

Large Gorgonians

EU-Spain 2019 Data: Large gorgonians were recorded in 6 of the 395 tows (1.52% of total tows analyzed), with depths ranging between 207 - 1155 m. None of the tows have significant catches of large gorgonians (≥ 0.6 kg/tow).

Small Gorgonians

EU-Spain 2019 Data: Small gorgonians were recorded in 41 tows (10.37 % of total tows analyzed), with depths ranging between 262 - 1438 m. No significant catches (> 0.15 kg/tow) were recorded.

Sea Pens

EU-Spain 2019 Data: Sea pens were recorded in 122 tows (30.88% of total tows analyzed), with depths ranging between 109 - 1438 m. No significant catches (> 1.4 kg/tow) were recorded.

The following activities and results of the projects of the EU NEREIDA and EU ATLAS were presented in 2019: Progress of the Mapping fishing effort and overlap with VME by the analysis of the integration of VMS and log-book data (2017 and 2018 years). . Additionally, a theoretical and preliminary exercise on “Up-date on bottom fishery risk assessment framework” was presented during 2019.

Updated information regarding Species Distribution Models (SDMs) for the *Pennatula aculeata* and *Acanella arbuscula* deep-water corals for Flemish Cap.

The seabed litter of the Flemish Pass was spatially analyzed and described using data from the EU-Spain groundfish surveys (NAFO Div 3L) for the 2006-2017 period.

It was presented an ongoing theoretical exercise of Maritime Spatial Planning (MSP) in the Flemish Cap and Flemish Cap area. This work pays special attention to the spatial overlap between emergent and existing uses of the marine space, as well as between human activities (footprints) and natural components of the ecosystem, taken into account the tensions between different regulatory and jurisdictional frameworks in areas beyond national jurisdictions.

It was presented sighting data and a species list of sea birds and marine mammals from EU-Spain scientific surveys on Div. 3L and sightings and marine mammals species list from IEO scientific observers on board commercial vessels on Div. 3LMNO.

SUBAREA 6

A. Status of the fisheries

One Spanish trawler operated during 2019 in Div. 6G NAFO Regulatory Area using a mid-water trawl gear. Fishing effort of this trawler was 8 days (33 hours). The most important species in catches was the alfonsino (*Beryx splendens*) and Greenland shark (*Somniosus microcephalus*) (Table 1).

Alfonsino Div. 6G: Catches of this species in 2019 in Div 6G were 1 tons made with a midwater trawl gear. Table 24 shows the total catches length distributions by sex of Div. 6G. Most of the catches were in the 33-40 cm total length range. This size distribution is formed of smaller individuals than in previous years.

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Table1. Spanish Catches (tons) in NAFO Area in 2019 by species and Division, based on the provisional Logbook data.

Code	English_name	Scientific_name	Provisional STATLANT 21A 2019					Total
			3L	3M	3N	3O	6G	
GHL	Greenland halibut	<i>Reinhardtius hippoglossoides</i>	2581	900	981	12		4473
RED	Atlantic redfishes nei	<i>Sebastes spp</i>	46	1966	472	1910		4393
SKA	Raja rays nei	<i>Raja spp</i>	18	16	1995	1101		3130
COD	Atlantic cod	<i>Gadus morhua</i>	1	2296	92	53		2442
HKS	Silver hake	<i>Merluccius bilinearis</i>			39	387		425
YEL	Yellowtail flounder	<i>Limanda ferruginea</i>	1	0	218	54		274
PLA	American plaice	<i>Hippoglossoides platessoides</i>	5	27	143	79		254
HAL	Atlantic halibut	<i>Hippoglossus hippoglossus</i>	11	18	74	74		177
SQI	Northern shortfin squid	<i>Illex illecebrosus</i>	0	0	49	113		162
WIT	Witch flounder	<i>Glyptocephalus cynoglossus</i>	17	77	13	47		154
HKW	White hake	<i>Urophycis tenuis</i>	0	0	14	72		86
RHG	Roughhead grenadier	<i>Macrourus berglax</i>	36	13	33	0		82
HKR	Red Hake	<i>Urophycis chuss</i>	5	3	21			29
CAT	Wolffishes(=Catfishes) nei	<i>Anarhichas spp</i>	3	12	1			16
RNG	Roundnose grenadier	<i>Coryphaenoides rupestris</i>	3	12				15
ANG	American angler	<i>Lophius americanus</i>			0	5		5
HAD	Haddock	<i>Melanogrammus aeglefinus</i>		0	0	2		3
GPE	Longfin Hake	<i>Phycis chesteri</i>	2					2
GDE	Threadfin rockling	<i>Gaidropsarus ensis</i>	2					2
BYS	Splendid alfonsino	<i>Beryx spp</i>					1	1
GSK	Greenland shark	<i>Somniosus microcephalus</i>					1	1
Total tons			2729	5340	4147	3908	2	16126

Table 2. Samples and individuals sampled by the IEO Scientific Observers by species, mesh size and NAFO Division in 2019

Code	Species	English_name	Catch/Disc.	Div.	Meshsize	Samples	Ind.
BYS	<i>Beryx splendens</i>	Splendid alfonsino	C	6G	3	19	683
RNG	<i>Coryphaenoides rupestris</i>	Roundnose grenadier	C	3L	130 mm	2	174
RNG	<i>Coryphaenoides rupestris</i>	Roundnose grenadier	C	3M	130 mm	3	277
COD	<i>Gadus morhua</i>	Cod	C	3M	130 mm	51	4870
COD	<i>Gadus morhua</i>	Cod	C	3N	130 mm	1	159
COD	<i>Gadus morhua</i>	Cod	C	3O	130 mm	1	66
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3M	130 mm	4	319
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3N	130 mm	1	154
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3N	280 mm	1	163
WIT	<i>Glyptocephalus cynoglossus</i>	Witch flounder	C	3O	130 mm	1	201
HAL	<i>Hippoglossoides platessoides</i>	American plaice	C	3M	130 mm	6	387
PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3O	130 mm	1	100
PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3N	280 mm	1	169
PLA	<i>Hippoglossoides platessoides</i>	American plaice	C	3O	280 mm	1	105
SQI	<i>Illex illecebrosus</i>	Short-finned squid	C	3O	60 mm	1	174
YEL	<i>Limanda ferruginea</i>	Yellowtail flounder	C	3N	280 mm	3	235
YEL	<i>Limanda ferruginea</i>	Yellowtail flounder	C	3O	280 mm	2	143
RHG	<i>Macrourus berglax</i>	Roughhead grenadier	C	3L	130 mm	33	3734
RHG	<i>Macrourus berglax</i>	Roughhead grenadier	C	3M	130 mm	21	2906
RHG	<i>Macrourus berglax</i>	Roughhead grenadier	C	3N	130 mm	2	175
HKS	<i>Merluccius bilinearis</i>	Silver hake	C	3O	130 mm	7	975
RJR	<i>Raja radiata</i>	Starry ray	C	3N	280 mm	18	1774
RJR	<i>Raja radiata</i>	Starry ray	C	3O	280 mm	3	260
GHL	<i>Reinhardtius hippoglossoides</i>	Greenland halibut	C	3L	130 mm	43	6091
GHL	<i>Reinhardtius hippoglossoides</i>	Greenland halibut	C	3M	130 mm	33	4538
GHL	<i>Reinhardtius hippoglossoides</i>	Greenland halibut	C	3N	130 mm	7	1001
RED	<i>Sebastes spp</i>	Redfish	C	3M	130 mm	30	3560
RED	<i>Sebastes spp</i>	Redfish	C	3M	130 mm	37	4779
RED	<i>Sebastes spp</i>	Redfish	C	3N	130 mm	4	753
RED	<i>Sebastes spp</i>	Redfish	C	3O	130 mm	29	5627
HKW	<i>Urophycis tenuis</i>	White hake	C	3O	130 mm	1	146
RED	<i>Sebastes spp</i>	Redfish	D	3M	130 mm	3	248

RED	<i>Sebastes spp</i>	Redfish	D	30	280 mm	1	105
RHG	<i>Macrourus berglax</i>	Roughhead grenadier	D	3L	130 mm	4	339
RHG	<i>Macrourus berglax</i>	Roughhead grenadier	D	3N	130 mm	1	43
PLA	<i>Hippoglossoides platessoides</i>	American plaice	D	3N	130 mm	1	180
YEL	<i>Limanda ferruginea</i>	Yellowtail flounder	D	3N	280 mm	1	116
RJR	<i>Raja radiata</i>	Starry ray	D	30	280 mm	1	102

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	15101	16608	18686							

Table 4. Fishing effort (hours) of the Spanish fleet in 2019 by quarter and Division, as well as percentage of effort by Division based on the Logbook data.

Division	Depth	1st Q	2nd Q	3rd Q	4th Q	Total	% Div.
3L	<200					0%	
	200-600					0%	
	>600					0%	
	Total	2012	1044	597	766	4420	24%
3M	<200					0%	
	200-600					0%	
	>600					0%	
	Total	1759	558	2067	359	4744	25%
3N	<200					0%	
	200-600					0%	
	>600					0%	
	Total	676	1002	1668	2446	5793	31%
3O	<200					0%	
	200-600					0%	
	>600					0%	
	Total	587	1201	960	982	3730	20%
	Total Hours	5035	3806	5292	4553	18686	100%
	%	27%	20%	28%	24%	100%	

Table 5. Percentage of the 2019 Spanish effort in SA 3 by mesh size, quarter and Division based on the Logbook data.

Div.	Mesh Size	1st Q	2nd Q	3rd Q	4th Q	Total
3L	<90 mm					
	100-200 mm	2012	1044	597	766	4420
	>200 mm					
3M	<90 mm					
	100-200 mm	1759	558	2067	359	4744
	>200 mm					
3N	<90 mm					
	100-200 mm	248	653	714	927	2543
	>200 mm	428	349	955	1519	3251
3O	<90 mm	0	0	145	5	150
	100-200 mm	173	609	618	844	2244
	>200 mm	414	592	197	133	1336

Table 6. Parameters of the length-weight relationship ($W(g) = a*L(cm)^b$) by species (2019).

Species	Source	a	b	SOP
Greenland halibut 3LMNO	FC Survey	0.00440	3.1484	0.99
Redfish 3O	3NO Survey	0.00737	3.1665	1.00
Redfish 3LN	3NO Survey	0.00737	3.1665	1.06
Redfish 3M	Comercial	0.01213	3.0309	0.97
Roughhead grenadier 3LMNO	3NO Survey	0.08904	2.9681	1.00
Witch flounder 3NO	3NO Survey	0.00194	3.3274	0.98
Witch flounder 3M	FC Survey	0.00070	3.6231	0.92
American plaice 3LNO	3NO Survey	0.00474	3.1627	1.01
American plaice 3M	FC Survey	0.00290	3.3359	0.97
Cod 3NO	3NO Survey	0.00531	3.1189	0.91
Cod 3M	FC Survey	0.00580	3.1067	1.00
Yellowtail Flounder 3LNO	Comercial	0.01866	2.7796	0.97
Skate 3LNO	3NO Survey	0.00741	3.0662	0.96
White Hake 3NO	3NO Survey	0.00352	3.1876	1.00
Alfonsino 6G	Comercial	0.02196	2.8218	0.96

Table 7. Length distribution of 3NO Spanish Cod catches.

Cod Length (cm)	Division 3NO			Total
	Males	Females	Ind.	
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	818	0	818
25	818	0	0	818
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	0	818	0	818
30	0	0	0	0
31	818	818	0	1637
32	818	1451	0	2269
33	1637	818	0	2455
34	818	1637	0	2455
35	3274	2269	0	5543
36	2455	3088	0	5543
37	0	1637	0	1637
38	4092	2455	0	6548
39	3274	4725	0	7999
40	4911	1451	0	6362
41	7366	4092	0	11459
42	3906	7999	0	11905
43	3088	3274	0	6362
44	6548	2269	0	8817
45	3906	3088	0	6994
46	3906	3720	0	7626
47	5543	818	0	6362
48	7180	4985	0	12165
49	5171	2269	0	7440
50	1637	3274	0	4911
51	2715	4985	0	7700
52	632	2529	0	3162
53	1451	3720	0	5171
54	1265	3534	0	4799
55	632	632	0	1265
56	3348	1265	0	4612
57	1265	1897	0	3162
58	0	0	0	0
59	1265	1265	0	2529
60	632	818	0	1451
61	818	0	0	818
62	0	1451	0	1451
63	0	0	0	0
64	818	818	0	1637
65	632	818	0	1451

66	0	818	0	818
67	0	0	0	0
68	0	0	0	0
69	0	0	0	0
70	1451	0	0	1451
71	0	0	0	0
72	0	0	0	0
73	0	0	0	0
74	0	0	0	0
75	0	0	0	0
76	0	0	0	0
77	0	0	0	0
78	632	0	0	632
79	0	0	0	0
80	0	0	0	0
81	0	0	0	0
82	0	0	0	0
83	0	0	0	0
84	0	0	0	0
85	0	0	0	0
86	0	0	0	0
87	0	0	0	0
88	0	818	0	818
89	0	0	0	0
90	0	0	0	0
91	0	0	0	0
92	0	0	0	0
93	0	0	0	0
94	0	0	0	0
95	0	0	0	0
96	0	0	0	0
97	0	0	0	0
98	0	0	0	0
99	0	0	0	0
100	0	0	0	0
Total	88728	83146	0	171875

Samples	2
Ind. Sampled	225
Catch (ton)	146
SOP	0.91

Table 8. Length distribution of 3M Spanish Cod catches.

Cod Length (cm)	Division 3M			Total
	Males	Females	Ind.	
37				0
38	32	0	0	32
39	138	101	0	238
40	440	352	0	793
41	341	516	0	857
42	562	333	0	896
43	1214	925	0	2139
44	876	844	0	1720
45	2381	695	0	3077
46	2363	1863	0	4226
47	1407	1467	0	2874
48	1698	1383	0	3081
49	1728	1341	0	3070
50	2642	1329	0	3970
51	4352	2197	0	6549
52	5357	2622	0	7979
53	6920	5170	0	12091
54	10860	6403	0	17264
55	11980	9100	1000	22080
56	15770	9984	0	25754
57	15250	12702	0	27953
58	20837	14582	0	35419
59	24203	12152	0	36356
60	20960	15327	0	36288
61	19809	16879	0	36688
62	15414	17510	0	32923
63	23327	14572	0	37899
64	26768	16149	0	42917
65	23447	13431	0	36878
66	23082	13873	0	36955
67	24943	13320	0	38263
68	20211	13749	0	33960
69	21392	18975	0	40366
70	17835	14380	0	32214
71	17304	13628	0	30932
72	16091	13025	0	29116
73	12884	11733	0	24616
74	11598	12464	0	24062
75	7965	11129	0	19094
76	6378	7018	0	13397
77	5318	6198	0	11515
78	5937	5976	158	12071
79	4632	5797	0	10429
80	4039	4758	0	8797
81	1639	3026	0	4665
82	2739	2061	0	4800
83	604	2965	0	3569
84	1599	692	0	2292

85	1215	1334	0	2550
86	960	1306	0	2266
87	326	869	0	1195
88	509	287	0	796
89	445	628	0	1073
90	169	1220	0	1389
91	0	661	0	661
92	704	323	0	1027
93	287	237	0	524
94	399	561	0	959
95	0	0	0	0
96	0	0	0	0
97	0	532	0	532
98	0	171	0	171
99	169	0	0	169
100	217	0	0	217
101	171	0	0	171
102	0	179	0	179
103	0	0	0	0
104	0	201	0	201
105	217	138	0	354
106	456	0	0	456
107	0	0	0	0
108	0	0	0	0
109	0	0	0	0
110	171	0	0	171
111	0	0	0	0
112	0	279	0	279
113	0	287	0	287
114	0	138	0	138
115	0	0	0	0
116	0	0	0	0
117	0	0	0	0
118	0	0	0	0
119	0	0	0	0
120	0	169	0	169
121	0	0	0	0
122	0	0	0	0
123	0	0	0	0
124	0	0	0	0
125	0	0	0	0
126	0	0	0	0
127	0	0	0	0
128	0	192	0	192
Total	473684	364406	1158	839249
Samples				51
Ind. Sampled				4870
Catch (tons)				2296
SOP				1.00

Table 9. Redfish 3M stock Spanish catches length distribution.

Redfish Length (cm)	Division 3M			Total
	Males	Females	Ind.	
10				0
11	0	0	846	846
12	0	0	846	846
13	0	0	0	0
14	1716	0	0	1716
15	3396	0	0	3396
16	0	324	0	324
17	892	0	0	892
18	1954	324	0	2278
19	31	990	0	1022
20	3271	1759	0	5030
21	6444	1725	0	8169
22	20517	4913	0	25429
23	39480	18333	0	57813
24	77976	16837	0	94813
25	85998	41146	0	127144
26	134522	48896	0	183417
27	150997	31966	0	182963
28	285664	55238	0	340902
29	443377	90607	0	533984
30	565994	133707	0	699700
31	425410	205908	0	631319
32	297033	274268	0	571301
33	113546	307001	0	420548
34	36693	274451	0	311145
35	18133	165277	0	183411
36	10054	106459	0	116514
37	8392	56478	0	64870
38	10285	29648	1347	41280
39	5544	17446	0	22989
40	3724	10068	0	13793
41	4073	10225	0	14298
42	3501	9789	0	13291
43	3483	6517	0	10001
44	751	4588	0	5339
45	1240	4057	0	5297
46	74	12389	0	12463
47	54	8111	0	8166
48	0	3648	0	3648
49	0	1831	0	1831
50	0	2659	0	2659
51	0	574	0	574
52	0	0	0	0
53	0	0	0	0
54	0	178	0	178
Total	2764222	1958337	3039	4725598
Samples				67
Ind. Sampled				8339
Catch (tons)				1966
SOP				0.97

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

Redfish Length (cm)	Division 3LN			Total
	Males	Females	Ind.	
10				0
11				0
12	1593	0	0	1593
13	0	0	0	0
14	0	0	0	0
15	0	0	0	0
16	0	0	0	0
17	0	0	0	0
18	0	0	0	0
19	0	0	0	0
20	5591	2403	0	7994
21	37186	5591	0	42778
22	184123	15178	0	199301
23	290891	90141	0	381032
24	290039	178360	0	468399
25	124842	211306	0	336148
26	94244	209749	0	303993
27	57452	277169	0	334622
28	22871	115249	0	138120
29	0	44954	0	44954
30	2403	32504	0	34907
31	2403	4806	0	7209
32	0	6398	0	6398
33	0	0	0	0
34	0	0	0	0
35	0	2403	0	2403
Total	1113638	1196213	0	2309851
Samples				4
Ind. Sampled				753
Catch (tons)				518
SOP				1.06

Table 11. Redfish 30 stock Spanish catches length distribution.

Redfish Length (cm)	30		Ind.	Total
	Males	Females		
10				0
11				0
12				0
13				0
14	0	0	231	231
15	0	0	0	0
16	0	0	2050	2050
17	318	0	3228	3546
18	13503	7260	3228	23991
19	13842	6737	3287	23866
20	51970	35069	6956	93995
21	338824	99294	11912	450030
22	899783	343240	3287	1246311
23	1555009	695216	0	2250226
24	1030230	1120781	0	2151011
25	375541	1253471	0	1629012
26	131885	970123	0	1102008
27	28706	529948	0	558654
28	10342	241236	0	251578
29	5290	143446	0	148736
30	2109	47827	0	49936
31	614	9675	0	10290
32	839	8640	0	9480
33	0	13585	0	13585
34	1624	1871	0	3495
35	0	932	0	932
36	0	0	0	0
37	0	1571	0	1571
38				0
39				0
40				0
Total	4460429	5529924	34180	10024533
Samples				29
Ind. Sampled				5627
Catch (tons)				1910
SOP				1.00

Table 12. American plaice 3LNO stock Spanish catches length distribution.

American Plaice Length (cm)	Division 3LNO			Total
	Males	Females	Ind.	
20	0	0	0	0
21	0	0	0	0
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	1441	0	0	1441
26	566	1441	0	2007
27	1382	0	0	1382
28	2883	2132	0	5015
29	1441	6278	0	7720
30	4579	5015	0	9594
31	1822	9161	0	10983
32	6021	11227	0	17248
33	8153	7022	0	15175
34	2262	10924	0	13186
35	2572	8160	0	10732
36	5765	15622	0	21387
37	2388	20078	0	22465
38	1131	16819	0	17950
39	0	21893	0	21893
40	4889	24078	0	28967
41	0	15485	0	15485
42	691	26014	0	26705
43	0	20570	0	20570
44	0	17617	0	17617
45	0	23328	0	23328
46	0	23072	0	23072
47	0	10285	0	10285
48	0	9779	0	9779
49	0	2388	0	2388
50	0	5145	0	5145
51	0	1131	0	1131
52	0	2572	0	2572
53	0	1441	0	1441
54	0	0	0	0
55	0	0	0	0
56	0	566	0	566
57	0	1441	0	1441
58	0	0	0	0
59	0	1131	0	1131
60	0	0	0	0
61	0	0	0	0
62	0	566	0	566
63	0	566	0	566
64	0	566	0	566
65	0	0	0	0

66	0	0	0	0
67	0	566	0	566
68	0	0	0	0
69	0	0	0	0
70	0	0	0	0
Total	47987	324077	0	372064

Samples	3
Ind. Sampled	464
Catch (tons)	226
SOP	1.01

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

American Plaice Length (cm)	Division 3M			Total
	Males	Females	Ind.	
30				0
31				0
32	224	0	0	224
33	361	123	0	483
34	409	0	0	409
35	318	0	0	318
36	357	0	0	357
37	827	40	0	867
38	1141	0	0	1141
39	1347	0	0	1347
40	1915	151	0	2066
41	2880	274	0	3154
42	2277	636	0	2913
43	2108	347	0	2456
44	1018	910	0	1928
45	315	535	0	849
46	654	1042	0	1696
47	336	950	0	1286
48	161	1068	0	1229
49	76	1771	0	1847
50	76	1062	0	1138
51	0	494	0	494
52	0	835	0	835
53	0	463	0	463
54	0	365	0	365
55	0	123	0	123
56	0	467	0	467
57	0	196	0	196
58	0	154	0	154
59	0	168	0	168
60	0	0	0	0
61	0	0	0	0
62	0	92	0	92
63				0
64				0
65				0
Total	16799	12266	0	29064
Samples				6
Ind. Sampled				387
Catch (tons)				27
SOP				0.97

Table 14. Witch flounder Spanish catches length distribution for Div. 3M.

Witch flounder Length (cm)	Males	3M Females	Ind.	Total
30				0
31				0
32				0
33				0
34				0
35				0
36	952	0	0	952
37	1125	0	0	1125
38	2374	130	0	2504
39	7837	1033	0	8869
40	14980	3593	0	18573
41	18525	2182	0	20707
42	11022	9071	0	20092
43	8583	6939	0	15523
44	5748	11563	0	17311
45	2213	10248	0	12461
46	1401	4978	0	6378
47	1049	2598	0	3647
48	995	2641	0	3636
49	481	1882	0	2363
50	0	1380	0	1380
51	0	97	0	97
52	385	1872	0	2256
53	0	514	0	514
54				0
55				0
56				0
57				0
58				0
59				0
60				0
Total	77670	60719	0	138389
Samples				4
Ind. Sampled				319
Catch (tons)				77
SOP				0.92

Table 15. Witch flounder Spanish catches length distribution for Div. 3NO.

Witch flounder Length (cm)	Males	Females	3NO Ind.	Total
26	0	0	0	0
27	0	0	0	0
28	0	0	0	0
29	451	0	0	451
30	0	0	0	0
31	451	0	0	451
32	476	0	0	476
33	451	25	0	476
34	25	476	0	502
35	25	476	451	953
36	476	76	0	552
37	2353	476	0	2829
38	6767	1003	0	7770
39	3335	2378	0	5713
40	5139	3028	0	8167
41	10928	8578	0	19507
42	2079	6045	0	8123
43	3208	7124	0	10332
44	1674	5695	0	7369
45	1599	7116	0	8715
46	646	6618	0	7264
47	1830	3554	0	5384
48	1353	3381	0	4734
49	928	4258	0	5185
50	0	1487	0	1487
51	195	963	0	1158
52	97	866	0	963
53	0	195	0	195
54	0	743	0	743
55	0	0	0	0
56	0	97	0	97
57	0	0	0	0
58	0	97	0	97
59	0	97	0	97
60	0	0	0	0
Total	44488	64855	451	109794
Samples				3
Ind. Sampled				518
Catch (tons)				60
SOP				0.98

Table 16. Yellowtail flounder Spanish catches length distribution for Div. 3LNO.

Yellowtail flounder Length (cm)	3LNO			Total
	Males	Females	Ind.	
20	0	0	0	0
21	4419	0	0	4419
22	0	0	0	0
23	0	0	0	0
24	4419	0	0	4419
25	2209	0	0	2209
26	8083	4419	0	12501
27	2209	0	0	2209
28	2209	0	0	2209
29	2209	0	0	2209
30	7046	4419	0	11465
31	19165	2209	0	21374
32	5873	9256	5086	20215
33	8600	8783	10172	27555
34	36969	19575	10172	66716
35	19499	37833	15259	72591
36	13599	27307	35603	76509
37	6109	49802	35603	91515
38	418	44662	35603	80683
39	0	23250	30517	53767
40	0	26510	15259	41768
41	0	16534	15259	31792
42	0	8655	10172	18827
43	0	11700	0	11700
44	0	1455	0	1455
45	0	2209	0	2209
46	0	0	0	0
47	0	0	0	0
48	0	0	0	0
49	0	0	0	0
50	0	0	0	0
Total	143035	298576	218706	660318
Samples				5
Ind. Sampled				613
Catch (tons)				274
SOP				0.97

Table 17. 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
20				0					0
21				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	0	0	0
25	0	0	0	0		0	0	0	0
26	398	0	285	683		0	0	0	0
27	0	0	0	0		0	0	0	0
28	398	0	0	398		0	0	0	0
29	0	1505	0	1505		0	0	0	0
30	1272	709	0	1980		255	0	0	255
31	1151	985	0	2135		0	0	0	0
32	1795	873	0	2669		255	0	0	255
33	2165	3100	0	5265		0	0	0	0
34	9077	5891	0	14968		497	929	0	1426
35	10600	10038	0	20639		880	1237	0	2118
36	13086	7759	0	20845		368	940	0	1307
37	14395	10139	221	24754		1808	1409	0	3217
38	15681	20568	662	36911		3280	2849	0	6129
39	20175	18090	1103	39368		1795	3105	140	5040
40	23774	29754	662	54189		2855	5651	0	8505
41	29999	35271	2426	67696		4053	7820	0	11873
42	34809	38836	1985	75630		5869	9300	140	15309
43	34923	45544	2205	82672		5809	10919	0	16728
44	37509	59091	1103	97703		6044	11923	0	17967
45	44261	69777	1103	115141		6697	11954	0	18651
46	42158	64098	1544	107800		8541	15682	0	24223
47	41377	77817	1985	121179		9514	12786	0	22300
48	50260	64226	1323	115810		8215	17169	0	25384
49	47393	74861	1103	123356		6459	18464	0	24923
50	32661	78978	0	111639		7525	17833	0	25358
51	44972	87739	0	132711		6763	20983	0	27745
52	25627	87100	0	112728		9114	21329	0	30444
53	21896	69567	0	91463		5878	27610	0	33488
54	23523	78197	0	101721		4395	24290	0	28685
55	19166	73797	0	92962		3457	20969	0	24426
56	14014	75180	0	89193		4240	25691	0	29931
57	8695	74561	0	83256		1854	22778	0	24632
58	7172	79439	0	86612		1396	26872	0	28268
59	3100	66439	0	69539		298	23782	0	24080
60	2810	61085	0	63894		822	30179	0	31001
61	2934	48324	0	51258		446	22824	0	23271
62	388	34562	0	34951		353	23953	0	24306
63	127	24188	0	24315		469	18476	0	18944
64	0	21207	0	21207		274	18118	0	18392
65	748	19715	0	20463		0	14743	0	14743

66	0	10120	0	10120	163	11567	0	11730
67	0	5299	0	5299	0	6881	0	6881
68	0	9523	0	9523	0	8140	0	8140
69	0	3316	0	3316	0	6812	0	6812
70	0	2961	0	2961	0	2248	0	2248
71	0	1756	0	1756	0	3125	0	3125
72	0	1978	0	1978	0	2422	0	2422
73	0	2088	0	2088	0	671	0	671
74	0	518	0	518	0	1642	0	1642
75	0	648	0	648	0	798	0	798
76	0	0	0	0	0	318	0	318
77	0	600	0	600	0	904	0	904
78	0	1060	0	1060	0	129	0	129
79	0	657	0	657	0	329	0	329
80	0	0	0	0	0	260	0	260
81	0	0	0	0	0	404	0	404
82	0	310	0	310	0	679	0	679
83	0	0	0	0	0	260	0	260
84	0	0	0	0	0	0	0	0
85	0	0	0	0	0	215	0	215
86	0	0	0	0	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	124	0	124
90	0	0	0	0	0	0	0	0
91	0	91	0	91	0	0	0	0
92	0	600	0	600	0	377	0	377
93	0	0	0	0	0	0	0	0
94	0	0	0	0	0	0	0	0
98	0	0	0	0	0	111	0	111
Total	684491	1660536	17706	2362733	120638	540984	280	661902
Samples				43				33
Ind. Sampled				6091				45388
Catch (tons)				2581				900

Table 17 (cont.). Greenland halibut Spanish catches length distribution for Div. 3NO.

Length (cm)	Division 3NO			Total
	Males	Females	Ind.	
20				0
21				0
22	1026	1026	0	2051
23	0	992	0	992
24	0	0	0	0
25	1959	1959	0	3918
26	1177	0	0	1177
27	1026	0	0	1026
28	1177	776	0	1953
29	6869	2828	0	9696
30	9604	4694	0	14297
31	17032	7021	0	24054
32	13689	7423	0	21111
33	7042	9039	0	16080
34	24308	16205	0	40513
35	15431	23426	0	38858
36	30445	25093	0	55537
37	30823	27327	0	58150
38	36348	33297	0	69645
39	23586	58679	0	82265
40	25906	42518	0	68424
41	31543	32194	0	63737
42	8353	36092	0	44445
43	15541	32207	0	47748
44	7618	37941	0	45559
45	21502	30845	0	52347
46	10671	14106	0	24777
47	15519	27128	0	42647
48	13759	22537	0	36296
49	9575	20997	0	30572
50	9337	22996	0	32333
51	8973	22848	0	31821
52	8104	29334	0	37437
53	1801	26100	0	27901
54	4537	11052	0	15589
55	2354	15804	0	18158
56	4786	13069	0	17855
57	2985	16367	0	19352
58	1026	20279	0	21305
59	330	20980	0	21310
60	1177	22389	0	23566
61	0	12582	0	12582
62	0	14048	0	14048
63	0	9488	0	9488
64	0	6456	0	6456
65	0	3160	0	3160

66	0	9214	0	9214
67	0	3976	0	3976
68	0	3309	0	3309
69	0	2203	0	2203
70	0	0	0	0
71	0	0	0	0
72	0	661	0	661
73	0	2828	0	2828
74	0	1026	0	1026
75	0	330	0	330
76	0	1177	0	1177
77	0	1356	0	1356
78	0	0	0	0
79	0	0	0	0
80	0	0	0	0
81	0	0	0	0
82	0	0	0	0
83	0	0	0	0
84	0	0	0	0
85	0	0	0	0
86	0	0	0	0
87	0	0	0	0
88	0	0	0	0
89	0	0	0	0
90	0	0	0	0
91	0	0	0	0
92	0	0	0	0
93	0	0	0	0
94	0	0	0	0
98	0	0	0	0
Total	426937	809382	0	1236318
Samples				7
Ind Sampled				1001
Catch (tons)				993

Table 17 (cont.). Greenland halibut Spanish catches length distribution for Div. 3LMNO.

Length (cm)	Division 3LMNO			Total
	Males	Females	Indter.	
20	0	0	0	0
21	0	0	0	0
22	1026	1026	0	2051
23	0	992	0	992
24	0	0	0	0
25	1959	1959	0	3918
26	1575	0	285	1860
27	1026	0	0	1026
28	1575	776	0	2351
29	6869	4333	0	11202
30	11130	5403	0	16533
31	18183	8006	0	26189
32	15739	8296	0	24035
33	9207	12138	0	21345
34	33882	23025	0	56908
35	26912	34702	0	61614
36	43898	33792	0	77690
37	47026	38875	221	86122
38	55309	56714	662	112684
39	45556	79874	1243	126672
40	52535	77922	662	131118
41	65595	75286	2426	143307
42	49032	84227	2125	135384
43	56273	88669	2205	147147
44	51171	108955	1103	161229
45	72460	112576	1103	186139
46	61370	93886	1544	156800
47	66410	117730	1985	186125
48	72235	103932	1323	177490
49	63427	114322	1103	178851
50	49523	119807	0	169330
51	60707	131570	0	192277
52	42845	137763	0	180609
53	29575	123278	0	152853
54	32455	113539	0	145994
55	24976	110570	0	135546
56	23039	113940	0	136979
57	13533	113706	0	127240
58	9594	126591	0	136185
59	3728	111201	0	114929
60	4808	113654	0	118462
61	3381	83730	0	87111
62	741	72563	0	73305
63	595	52152	0	52747
64	274	45782	0	46056
65	748	37618	0	38366

66	163	30901	0	31064
67	0	16156	0	16156
68	0	20972	0	20972
69	0	12331	0	12331
70	0	5209	0	5209
71	0	4881	0	4881
72	0	5061	0	5061
73	0	5586	0	5586
74	0	3186	0	3186
75	0	1776	0	1776
76	0	1495	0	1495
77	0	2860	0	2860
78	0	1188	0	1188
79	0	986	0	986
80	0	260	0	260
81	0	404	0	404
82	0	990	0	990
83	0	260	0	260
84	0	0	0	0
85	0	215	0	215
86	0	0	0	0
87	0	0	0	0
88	0	0	0	0
89	0	124	0	124
90	0	0	0	0
91	0	91	0	91
92	0	977	0	977
93	0	0	0	0
94	0	0	0	0
98	0	111	0	111
Total	1232067	3010902	17986	4260954

Samples	83
Ind Sampled	52480
Catch (tons)	4474
SOP	0.99

Table 19. Skates Spanish catches length distribution by sex for Div. 3LNO.

Skates Length (cm)	3LNO			Total
	Males	Females	Ind.	
20	0	0	0	0
21	1411	0	0	1411
22	0	0	0	0
23	0	0	0	0
24	0	0	0	0
25	0	0	0	0
26	0	0	0	0
27	1244	0	0	1244
28	4022	0	0	4022
29	1411	4667	0	6077
30	0	4834	0	4834
31	0	1411	0	1411
32	0	4713	0	4713
33	1411	639	0	2050
34	11079	0	0	11079
35	6884	338	0	7222
36	6119	2300	0	8419
37	7973	848	0	8822
38	8916	4402	0	13317
39	3244	4381	0	7625
40	4899	7088	0	11988
41	19349	11210	0	30559
42	6825	9102	0	15927
43	11416	11932	0	23348
44	13017	9236	0	22253
45	22459	19922	0	42381
46	23023	5678	0	28701
47	24289	25117	0	49406
48	34603	20256	0	54860
49	24403	12191	0	36593
50	11945	21845	0	33790
51	22212	19829	0	42040
52	17325	16974	0	34299
53	35804	27928	0	63732
54	25317	14499	0	39816
55	21228	19301	0	40530
56	23074	26648	0	49722
57	20432	25650	0	46082
58	13763	18328	0	32091
59	16757	20708	0	37465
60	23148	16738	0	39886
61	18533	12326	0	30858
62	11933	10980	0	22913
63	7903	20037	0	27940
64	15938	12579	0	28517
65	23120	15860	0	38980

66	16346	19990	0	36336
67	14841	19167	0	34007
68	10946	18463	0	29409
69	20092	10951	0	31043
70	15177	17111	0	32289
71	12432	15143	0	27575
72	15668	20788	0	36456
73	11526	12437	0	23963
74	25819	4634	0	30453
75	19610	8716	0	28327
76	13372	6287	0	19659
77	5449	1514	0	6963
78	8142	4779	0	12921
79	16239	2334	0	18573
80	11731	5492	0	17223
81	12220	201	0	12421
82	11436	203	0	11639
83	5418	1657	0	7075
84	620	0	0	620
85	4633	0	0	4633
86	3530	3423	0	6953
87	829	246	0	1075
88	1244	0	0	1244
89	826	3423	0	4249
90	1244	0	0	1244
91	1252	0	0	1252
92	0	0	0	0
93	0	0	0	0
94	0	0	0	0
95	0	0	0	0
Total	807068	637455	0	1444522

Samples	21
Ind. Sampled	2034
Catch (ton)	3114
SOP	0.96

Table 20. 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	40	155	195
6	0	0	0	0
7	228	209	0	438
8	275	308	1	584
9	1721	283	19	2023
10	2152	1091	1	3245
11	2025	1555	0	3580
12	4692	2670	0	7362
13	5978	5622	0	11600
14	9869	7207	0	17076
15	10079	7986	0	18065
16	10448	7803	0	18251
17	11276	5968	0	17245
18	7945	6629	0	14574
19	6224	4567	0	10791
20	3208	5708	0	8916
21	1060	4570	0	5630
22	524	2571	0	3095
23	75	2843	0	2918
24	35	2482	0	2517
25	0	3423	0	3423
26	7	1140	0	1147
27	11	1787	0	1797
28	0	1813	0	1813
29	0	2310	0	2310
30	0	194	0	194
31	0	374	0	374
32	0	188	0	188
33	0	139	0	139
34	0	90	0	90
35	0	6	0	6
36	0	0	0	0
37	0	0	0	0
38	0	15	0	15
39	0	11	0	11
40	0	0	0	0
Total	77832	81602	176	159610
Samples				56
Ind. Sampled				6815
Catch (tons)				82
SOP				1.00

Table 21. White hake Spanish catches length distribution by sex for Div. 3NO.

White hake Length (cm)	3NO			Total
	Males	Females	Ind.	
30				0
31	617	0	0	617
32	617	0	0	617
33	0	0	0	0
34	617	0	0	617
35	0	0	0	0
36	0	0	0	0
37	0	0	0	0
38	0	0	0	0
39	2466	617	0	3083
40	1233	0	0	1233
41	6166	617	0	6782
42	2466	0	0	2466
43	4316	3083	0	7399
44	6782	617	0	7399
45	4316	2466	0	6782
46	2466	1233	0	3699
47	3699	1850	0	5549
48	617	1233	0	1850
49	3083	0	0	3083
50	1850	4316	0	6166
51	1850	2466	0	4316
52	1233	1850	0	3083
53	1850	1850	0	3699
54	1233	0	0	1233
55	1850	1233	0	3083
56	1233	617	0	1850
57	617	3699	0	4316
58	617	1850	0	2466
59	617	0	0	617
60	617	617	0	1233
61	1233	0	0	1233
62	0	0	0	0
63	617	0	0	617
64	0	0	0	0
65	0	617	0	617
66	1233	617	0	1850
67	0	0	0	0
68	0	0	0	0
69	0	1850	0	1850
70	0	0	0	0
71	0	617	0	617
72				0
73				0
74				0
75				0

Total	56108	33911	0	90019
Samples				1
Ind. Sampled				146
Catch (ton)				86
SOP				1.00

Table 22. Squid 3NO Spanish catches length distribution.

Squid Length (cm)	Division 3NO			Total
	Males	Females	Ind.	
14.0	0	0	0	0
14.5	0	0	0	0
15.0	0	0	33401	33401
15.5	0	0	58451	58451
16.0	0	0	91852	91852
16.5	0	0	158654	158654
17.0	0	0	208755	208755
17.5	0	0	175354	175354
18.0	0	0	167004	167004
18.5	0	0	183705	183705
19.0	0	0	83502	83502
19.5	0	0	125253	125253
20.0	0	0	66802	66802
20.5	0	0	58451	58451
21.0	0	0	25051	25051
21.5	0	0	16700	16700
22.0	0	0	0	0
22.5	0	0	0	0
23.0	0	0	0	0
Total	0	0	1452936	1452936
Samples				1
Ind. Sampled				174
Catch (tons)				162
SOP				

Table 23. Greenland halibut Spanish 2019 catches total Age Length key (ALK).

CLAVE LENGTH	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	TOTAL
23	1	1																		2
24																				0
25																				0
26			1																	1
27																				0
28																				0
29		2																		2
30		1	1																	2
31		2	1																	3
32			1	1																2
33			4																	4
34			9	6																15
35			6	15																21
36			6	21																27
37			5	18																23
38			4	34	2															40
39			2	33	9															44
40				31	17															48
41				40	24															64
42				20	41															61
43				23	40	1														64
44				15	57															72
45				4	65	3														72
46				1	67	7														75
47					58	21														79
48				1	50	32														83
49				1	28	49														78
50					21	42	4													67
51					12	64	10													86
52					5	57	14	3												79
53						45	29	1												75
54						43	20	6												69
55						29	22	10												61
56						32	21	9	1											63
57						16	26	19	2	1										64
58						14	20	15	9											58
59						4	15	24	7	2										52
60							14	32	3	2										51
61							11	24	5	1										41
62							1	4	28	10	2									45
63								1	15	14	4	2								36
64								1	18	8	4	1								32
65									10	15	6	2								33
66									3	7	5	3	2	1						21
67								1	4	5	6	5								21
68									3	11	9	3	1							27
69									1	3	8	3	2							17
70										2	3	3	2							10
71									1	1	7	2	2							13
72											5	3	1	1	1					11
73										1	2	2	1	1						7
74											5	4	2							11
75											3	1	2	1						7
76														2						2
77													2	1	2					5
78													2	1	1					3
79											1			3	1			1		6
80														1						2
81																			1	1
82														1	1			1		3
83																		2		2
84																			1	1
85																			1	0
86																		1		1
87																				0
88																			1	1
89																		1		1
90																				0
91																				0
92																		2		2
93																			1	1
94																				0
95																				0
96																				0
97																				0
98																			1	1
TOTAL	1	7	39	264	496	459	182	119	158	86	51	45	23	17	9	5	5	1	4	1971



Table 23(Cont.) Greenland halibut Spanish 2019 catches males Age Length key (ALK).

CLAVE LENGTH	Ages													TOTAL		
	1	2	3	4	5	6	7	8	9	10	11	12	13			
22		2													2	
23		2													2	
24		1	2												3	
25		2	2												4	
26		1	4												5	
27		1	6												7	
28			6												6	
29			1												1	
30			1	1											2	
31			1	1											2	
32					1										1	
33				1											1	
34				5	3										8	
35				3	9										12	
36				3	13										16	
37				1	11										12	
38				2	20										22	
39				2	18	4									24	
40					18	7									25	
41					21	10									31	
42					6	21									27	
43					12	15									27	
44					6	22									28	
45					2	22	2								26	
46						31	4								35	
47						22	12								34	
48						19	20								39	
49						13	21								34	
50						8	20								28	
51						5	26	4							35	
52						2	23	9	1						35	
53							19	11							30	
54							14	10	2						26	
55							15	8	3						26	
56							12	4	2						18	
57							2	8	4						14	
58								3	3	5					11	
59										1	1				2	
60										1	6				7	
61										1	2				3	
62											2				2	
63											6	4	1		11	
64											4	8	1		13	
65											2	6	2		10	
66										1	1	5	3		10	
TOTAL		0	9	23	19	140	201	193		57	21	24	23	7	0	717

Table 23 (Cont.) Greenland halibut Spanish 2019 catches females Age Length key (ALK).

CLAVE LENGTH	Ages																				TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
22		2																			2
23		1	1																		2
24		1	2																		3
25		2	2																		4
26		1	4																		5
27		1	6																		7
28			6																		6
29			1																		1
30			1	1																	2
31			1																		1
32				1																	1
33				3																	3
34				4	3																7
35				3	6																9
36				3	8																11
37				4	7																11
38				2	14	2															18
39					15	5															20
40					13	10															23
41					19	14															33
42					14	20															34
43					11	25	1														37
44					9	35															44
45					2	43	1														46
46					1	36	3														40
47						36	9														45
48					1	31	12														44
49					1	15	28														44
50						13	22	4													39
51						7	38	6													51
52						3	34	5	2												44
53							26	18	1												45
54							29	10	4												43
55							14	14	7												35
56							20	17	7	1											45
57							14	18	15	2	1										50
58							11	17	10	9											47
59							4	15	23	6	2										50
60								13	26	3	2										44
61								10	22	5	1										38
62								1	4	26	10	2									43
63									1	15	14	4	2								36
64									1	18	7	4	1								31
65										10	15	6	2								33
66										3	7	5	3	2	1						21
67									1	4	5	6	5								21
68										3	11	9	3	1							27
69										1	3	8	3	2							17
70											2	3	3	2							10
71										1	1		7	2	2						13
72													5	3	1	1	1				11
73												1	2	2	1	1					7
74													5	4	2						11
75													3	1	2	1					7
76																2					2
77															2	1	2				5
78															2		1				3
79														1		3	1		1		6
80																1			1		2
81																			1		1
82																1	1	1			3
83																		2			2
84																				1	1
85																		1			1
86																				1	1
87																				1	0
88																				1	1
89																			1		1
90																					0
91																				1	1
92																			2		2
93																					1
TOTAL	0	8	24	21	124	295	266	125	99	147	85	51	45	23	17	9	6	5	1	5	1356



Table 24. Splendid alfonsino Spanish catches length distribution for Div. 6G.

Splendid alfonsino Length (cm)	6G		Ind.	Total
	Males	Females		
25				0
26	2	0	0	2
27	0	0	0	0
28	0	0	0	0
29	4	2	0	6
30	2	3	0	5
31	34	17	0	51
32	51	27	0	78
33	58	77	0	135
34	74	86	0	160
35	86	99	0	184
36	132	156	0	288
37	140	123	0	262
38	147	255	0	402
39	115	147	0	261
40	87	72	0	159
41	39	73	0	112
42	31	37	0	68
43	5	5	0	10
44	16	20	0	35
45	0	21	0	21
46	5	16	0	21
47	0	0	0	0
48	0	7	0	7
49	0	1	0	1
50	0	0	0	0
51	0	0	0	0
52	0	0	0	0
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	3	0	0	3
59				0
60				0
Total	1030	1243	0	2274
Samples				19
Ind. Sampled				683
Catch (tons)				1
SOP				0.96

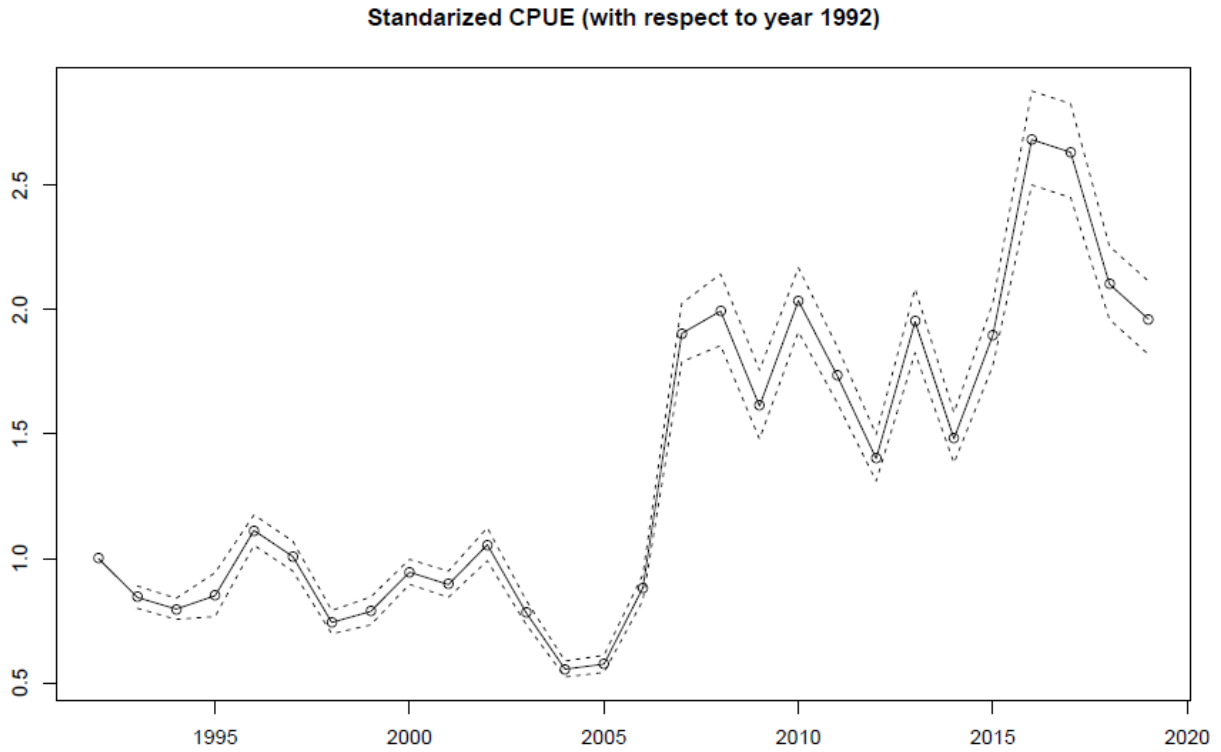


Figure 1. Spanish fleet standardized CPUE with model presented by Gonzalez-Costas and Gonzalez-Troncoso (2009) update with the 2019 data.