

# Allocation of trips to metiers for the Spanish fleet operating in ICES areas under IEO data collection programme

Manuel Marín<sup>a</sup>, José Rodríguez<sup>b</sup> y José Castro<sup>a</sup>

<sup>a</sup>Instituto Español de Oceanografía, centro costero de Vigo. Avda. Beiramar, 37. 36202 Vigo.

<sup>b</sup>Instituto Español de Oceanografía, centro costero de Santander. Promontorio San Martín s/n, 39004 Santander

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## 1. Abstract

A need to understand and identify current practices used by Member States to allocate trips to metiers has arisen in recent years in experts groups related to European data collection work.

Spanish fleets operating in waters of the northeast Atlantic are classified into censuses, fisheries and metiers using their landings per fishing day recorded in the official fishing logbooks and first sale notes. The censuses classify the ships by fishing grounds; the fisheries are sets of trips in a certain fishing ground and the metiers are the groups of fishing operations targeting a species or group of species and they are classified according to the Decision of the Commission of November 6, 2008 (2008/949/EC).

This working document contributes to this discussion presenting the fisheries classification of the Spanish fleets operating in ICES waters and the methodologies used by the Spanish Institute of Oceanography (IEO) to identify metiers in these waters. Metiers are identified by the application of multivariate techniques (CLARA) to find homogeneous groups of catch profiles. The Spanish fleets operating in the ICES area totalize 33 metiers DCF.

## 2. Scope

The classification in metiers is done using as source of information the fishing logbooks, the landing declarations and the first sale notes.

The agreed definition of metier is a group of fishing operations targeting a similar (assemblage of) species, using similar gear, during the same period of the year and/or within the same area and which are characterised by a similar exploitation pattern (ICES 2003, 2004; Commission Decision 2008/949<sup>1</sup>). The collection of fishery data in sampling programs is usually associated with a fishing trip. So, catches, discards, efforts, etc. can be linked to variables of interest such as the gear used, the geographic area, the season and the target species using logbooks as source of information.

Council Regulation (EC) No 2847/93<sup>2</sup> established the obligation to complete a logbook along with a landing declaration for all vessels above of 10 meters' length overall. In addition, the regulations stipulated that Member States must present the first sale notes for all vessels, including those less than 10 meters in length overall. These requirements are currently in force under Council Regulation (EC) No. 1224/2009<sup>3</sup>.

The Spanish Administration classifies fishing vessels in censuses, fishing grounds and registration modalities. The "censuses" are lists of vessels by fishing grounds that together constitute the so-called "*Operational Fishing Fleet Census*" (CFPO, by its Spanish acronym); "fishing ground" refers to a geographical area subject to management or conservation measures, while the way of use of a particular gear is called "modality" (Castro *et al.*, 2011). The jurisdiction of the waters makes it possible to differentiate the fishing grounds of national waters from free or third countries waters. In this document, only the fleets whose activity is carried out in the Atlantic waters under Spanish national jurisdiction (except the Canary Islands fishing ground) and in EU waters within the scope of the International Council for the Exploration of the Sea (ICES) will be considered.

In Atlantic national waters, the Spanish Administration differentiates two fishing grounds: Northwestern-Cantabrian fishing ground (ICES Divisions IXa-North and VIIIc) and Gulf of Cádiz fishing ground (ICES Division IXa-South). In the first, there are six types of fishing modalities: bottom trawling, purse seine, set longline, set gillnet ("*volanta*" and "*rasco*") and minor-gear fleet (small scale fleet using a variety of gears and traps). The bottom trawl can be used with one or two boats (pairs). "*Volanta*" is a type of gillnet targeting hake (*Merluccius merluccius*) and "*rasco*" is another type of gillnet targeting monkfish (*Lophius* spp.). The modality of minor-gear fleet includes a variety of fishing gears targeting both demersal and

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<sup>1</sup> OJ L 346, 23.12.2008, p. 37-88

<sup>2</sup> OJ L 261, 20.10.1993, p. 1

<sup>3</sup> OJ L 343, 22.12.2009, p. 1-50

pelagic species. In the Gulf of Cádiz, there are three types of fishing modalities: bottom trawling, purse seine and minor-gear fleet. In this fishing ground the bottom pair trawl is not allowed and the minor-gear fleet include dredges, gillnets, trammel nets, hooks and traps.

In the EU waters –Subareas ICES VI, VII and Divisions VIIIabde and part of IXa— Spanish fleets operate with fishing licenses in the waters of the United Kingdom, Ireland, France and Portugal. In these fishing grounds the gears used are bottom trawl, purse seine (seasonally), gillnets and set longline.

In addition to these modalities, the Spanish Administration through the Fishing General Secretariat (SGP, by its Spanish acronym), grants temporary licenses for the use of seasonal resources in national waters and in free waters (albacore tuna, *Thunnus alalunga*).

### 3. Material

In both the EU data collection and ICES context, to provide estimates of the annual fishing activity of the Spanish fleet, it is necessary to disaggregate into measurable units such as the metiers. This task is only possible through the use of official fishery statistics, specifically fishing logbooks, landing declarations (integrated into the fishing logbooks), and first sale notes. In addition, the classification of the fleet in censuses by fishing grounds allows quick and easy extraction the official information from fishing logbooks and first sale notes. As a final complement to the integration of all information, a hierarchical database<sup>4</sup> nominates each fishing trip at the level of metiers DCF. Table 1 shows the structure of the database and the relationships between the different sources of information.

#### 3.1. Fishing logbooks (DP)

The fishing logbook records the daily activity of the fishing vessel; the element that identifies the fishing trip is a unique numeric key that distinguishes the different trips of the vessel. Fishing logbooks contain fishery information with a level of disaggregation determined by four variables: vessel, gear, day and statistical rectangle (ICES squares of 1° of longitude x 0.5° of latitude).

#### 3.2. Landing declarations (DD)

Landing declarations are the official declaration of the activity of the vessel with the landings of each species in live weight. It is a summary of the activity carried out during the fishing trip with the landings in port.

#### 3.3. First sales notes (NV)

The first sale notes record less information than the fishing logbook. The Fishing General Secretariat provides a database with information of the national vessel code (CFR), port of landing and place of sale with their respective dates, value (€) and live weight (kg) by species. Unlike fishing logbooks, there is no unique numeric key assigned to the fishing trip or fishing operation from which the landings come from.

#### 3.4. Operational Fishing Fleet Census (CFPO)

The CFPO allows us to know the technical characteristics of the vessels that are assigned to the fishing grounds and registration modalities. Each vessels is assigned into strata of length (or fleet segments defined by the DCF) on the basis of a homogeneous fishing activity and similar technical characteristics.

#### 3.5. Table of metiers classification (OFIDAT)

Table that classifies the fishing trips in metiers DCF. It is a hierarchical classification database of metiers that relates the information of the fishing activity with the metiers DCF. It is also the basic element for the extraction of weighting conglomerates (metier, area, month, port, etc.).

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<sup>4</sup> Table “OFIDAT”, acronym of *official data*.

## 4. Methodology

The methodology and subsequent hierarchical classification in metiers was developed along different national works (Punzón *et al.*, 2001; Bellido *et al.*, 2003; Castro and Punzón, 2005; Abad *et al.*, 2007; Castro *et al.*, 2007) partly based on some expert groups recommendations (ICES, 2003). From a legal framework perspective the system was finally conceived in 2009 in accordance to Commission Decision 2008/949<sup>5</sup>, and it's currently in accordance with regulation Commission Decision (EU) 2016/1251<sup>6</sup>.

The disaggregation of the fishing activity of the Spanish fleets in metiers DCF requires a series of previous steps: (i) the extraction of the relevant information from the fishing logbooks and the first sale notes; (ii) develop an *ad-hoc* database; (iii) identify the fishing trips and, (iv) the classification of each fishing trip in metier DCF.

### 4.1. Selection of relevant information

Grouping fishing trips into homogeneous sampling units present three problems: ensure that the sampling units are homogeneous (Cochran, 1977); define the fishing units with a similar exploitation pattern (metiers) and group the different fishing units into a hierarchical structure to enable handling and treatment at different levels of disaggregation. The analysis of the landings of a trip can be difficult when these landings result from a combination of gears and/or areas. A good candidate to solve this problem is the fishing operation or the haul. However, fishing logbooks do not currently record the catches at the haul level and, for that reason, the primary sampling unit is the fishing trip. In Spain, fishers can only use one fishing gear by trip. The fishing trip is identified in the logbooks with a unique numerical code (*Id\_trip*). Table 2 shows the fields selected from the fishing logbooks for the segmentation process in metiers DCF.

### 4.2. Matching fishing logbooks and sales notes.

The first sale notes do not provide an ID that relates them to the corresponding fishing trips in logbooks, so a matching process to link both sources of information is required. In order to achieve this objective, an algorithm has been developed that assigns the "*Id\_trip*" code from the fishing logbooks to the first sale notes. However, sometimes differences of one or several days are observed due to assignment errors or due to logistical and commercial issues (e.g. transshipments in ports other than the port of sale). To correct these discrepancies, the algorithm searches progressively for matching landing dates in a range of +/- 5 days. At the end of the process, all those records without "*Id\_trip*" are considered equally valid for the purposes of landing and effort calculations and they are also assigned an "*Id\_trip*". This identifier is numeric and consists of a correlative number whose first two digits correspond to the last two digits of the current year.

### 4.3. Metier identification: methodology

The objective is to identify groups of vessels with similar technical characteristics (gear) and similar exploitation patterns. There are several methodologies to achieve this objective, however, in ICES waters, multivariate statistical techniques are used. Through these techniques the metiers are inferred using catch profiles. There are two relevant factors to consider when using these techniques: (i) the large volume of information, since the appropriate multivariate method must have a high capacity for analysis; (ii) ensure that it must provide an index that can be used objectively in the analysis and reproducible by any user.

In 2003, an ICES study group agreed on a common methodological basis applicable to the identification of metiers of European fleets: "*Study Group for the Development of Fishery-based Forecasts*" (SGDFF) (ICES, 2003). This group recommended the use of multivariate analysis techniques on catches, landings or on the sale value of the landed species. Cluster analysis (Hair *et al.*, 1999) is an appropriate methodology that allows searching groups of common catch profiles. This methodology consists in searching of homogeneous groups, so that the objects belonging to the same group resemble each other,

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<sup>5</sup> OJ L 346, 23.12.2008, p. 37–88

<sup>6</sup> OJ L 207, 1.8.2016, p. 113–177

maximizing the differences with respect to the objects belonging to other groups. CLARA (*Clustering Large Applications*, Kaufman and Rousseeuw, 1990) is an algorithm that allows working with large data sets. CLARA randomly samples smaller subgroups within the original data set, to which they are assigned, and applies the PAM (*Partitioning Around Medoids*) algorithm. The PAM function is more robust than other techniques because it minimizes a sum of dissimilarities instead of a sum of squares of distances (called "*centroid*"), which makes it more robust with respect to outliers (Kaufman and Rousseeuw, 1990). The characteristic object of the cluster obtained is the "*medoid*" that would be the central point with respect to which the distances of the other objects of the same cluster are minimum and, at the same time, the distances are maximum with respect to other objects of other clusters.

#### 4.4. Metier identification: protocol

The procedure for the identification of metiers has the following steps:

##### (i) Creation of a trip matrix by registration modalities

The trip matrix groups the activity of each vessel by fishing trip selecting the fishing modalities and putting special attention that there are no duplicate values. The catch values (kg/€) are converted into relative values (%) with respect to the total trip.

##### (ii) Application multivariate analysis (CLARA) to the trip matrix in percentages

In the application of the CLARA algorithm, a series of combinations of sample size are tested with different numbers of groups of samples. In this way the results of each combination are analyzed. By comparing their respective silhouette values (SC), the one with the highest coefficient is chosen (Castro, J. *et al.*, 2010; 2011). Since the input data are relativized to percentages, the Euclidean distance is used as a measure of dissimilarity between the objects (Holley and Marchal, 2004). According to Kauffman and Rousseeuw (1990) a cluster structure is found when the SC coefficient is greater than 0.5; with some structure of cluster when the SC takes values between 0.25 and 0.50 and without cluster structure when it is less than 0.25. The statistical programming language R (R Core Team, 2017) and the "cluster" package (Maechler *et al.*, 2017) are used for the analysis.

##### (iii) Identification of metiers DCF

Significant clusters obtained from the CLARA analysis ("Metier IEO", table 3), are confirmed by their catch profile. Catch profiles are characterized by being represented by one or a small number of species and offer information on the degree of specialization of the vessels. Once the metiers are assigned to the fishing trip, spatial and temporal analysis of the captures and associated efforts are carried out to confirm their consistency not only at the statistical analysis level but also due to their persistence over time. For this purpose, prior knowledge of the fisheries is also useful and it may even be necessary to implement confirmatory interviews directed at the industry.

Furthermore, since the matrix of fishing activities of the DCF contemplates the segmentation of vessels by length category (LOA), a threshold of 50% of fishing trips has been established from which it is considered that the vessel has a high degree of specialization in an activity (gear group and length category) (table 4).

##### (iv) Regrouping "Metier IEO" to metier DCF

"Metier IEO" is a higher degree of segmentation beyond those required by the DCF. In most cases the CLARA analysis determines the metier IEO however for those trips whose modality is univocal with the mesh used, the assignment of the metier DCF is done directly (step "v" of this procedure). "Metier IEO" are useful to obtain index (effort, CPUE, etc) for specific fisheries or for more generic levels such as DCF metiers when they are regrouped at such level. Table 4 shows the entire hierarchical identification structure of the Spanish metiers and the analytical identification method.

##### (v) Assignment of metiers at level 6 DCF

DCF metiers are obtained regrouping the metiers IEO. Specific assignments are shown in Table 4.

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Annex I: tables

Tabla 1. Integration design of the official databases and the hierarchical metiers DCF. Notes: *CFR*, Community Fleet Register code; *Sampling\_stratum*, Spanish sampling stratum DCF.

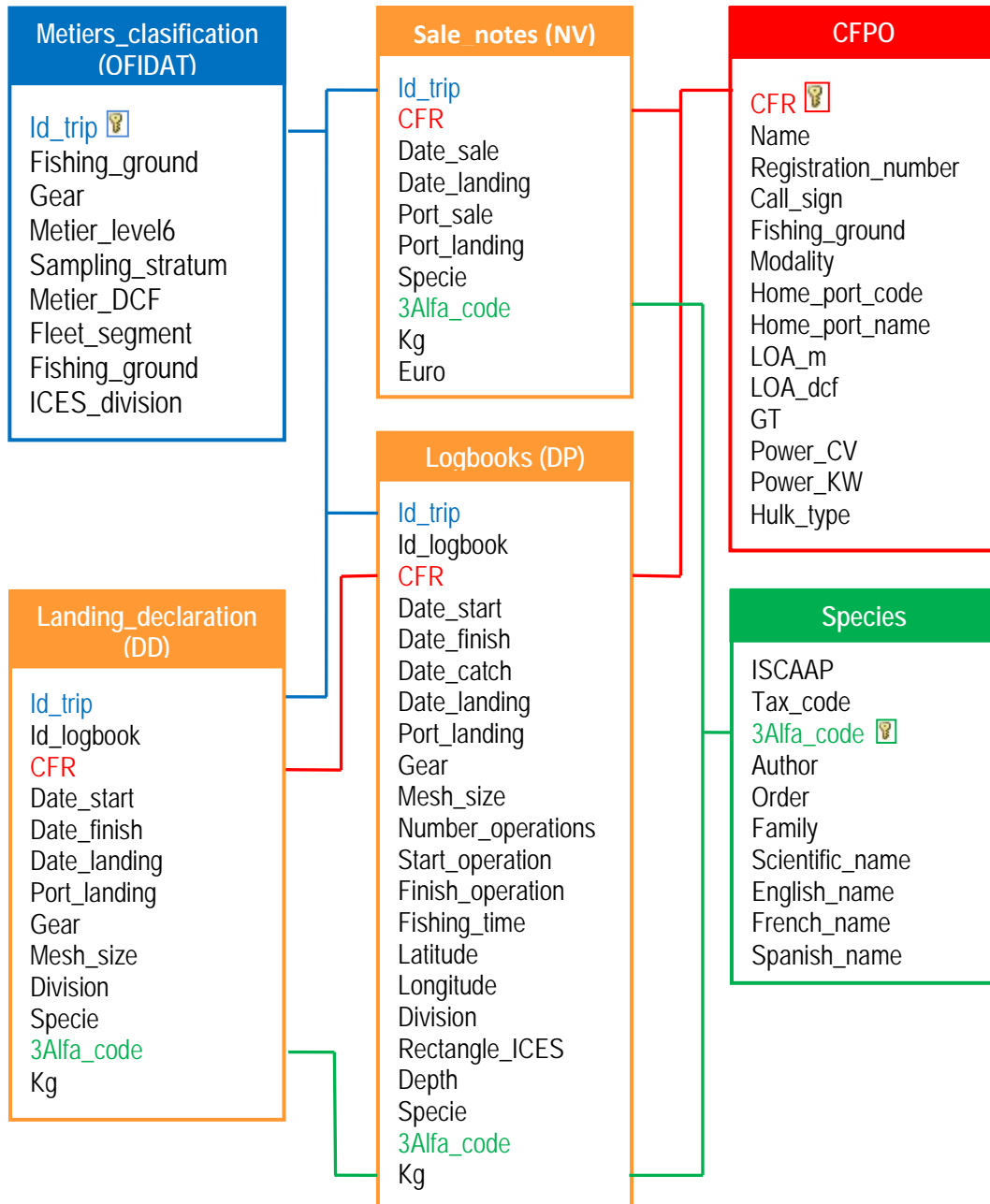




Table 2. Description of the fields selected from the logbooks.

Field	Data	Description	Value
Id_trip	Integer	A primary key with values that are unique throughout a table	Last two digits of the actual year + sequential numbers
CFR	Integer	European fleet registry code	Country code + numeric
Date_start	Date/time	Trip start date and time	dd/mm/yyyy hh:mm
Date_finish	Date/time	Trip finish date and time	dd/mm/ yyyy hh:mm
Date_catch	Date/time	Catch date and time	dd/mm/ yyyy hh:mm
Date_landing	Date/time	Landing date and time	dd/mm/ yyyy hh:mm
Month	Integer	Month code	Range from 1 to 12
Port_landing	Character	Landing port	Name of port
Gear	Character	Name of the fishing gear	National name
Dimension1	Integer	Length of nets, lines, etc.	Meters or centimetres
Dimension2	Integer	Height of panels, number of hooks, etc.	
Dimension3	Integer	Number of nets, number of lines, etc.	
Mesh_size	Integer	Mesh size of the codend, hook size, etc.	Millimetres
Start_operation	Date/time	Start operation date and time	dd/mm/ yyyy hh:mm
Fishing_time	Double	Soaking time	hh
Number_operations	Integer	Number of sets	Number by day
Latitude	Double	Latitude	Decimal degrees
Longitude	Double	Longitude	
Division	Character	ICES Division	ICES coding
Rectangle_ICES	Character	Statistical rectangle	ICES coding
Depth	Integer	Fishing depth	Soaking depth
Specie	Character	Scientific name	FAO-ASFIS
3Alfa_code	Character	3 Alfa code from FAO	
Kg	Double	Weight by specie retained onboard	Fish live weight

Tabla 3. List of metiers and technique used for identification.

Fishing ground	Modality	Ug <sup>7</sup>	Metier IEO	Description	Metier DCF	Analytical method
1 (VIIIc and IXa-north)	Trawl	OTB10	OTB11	Otter trawl targeting mix-species	OTB_DEF_>=55_0_0	CLARA
			OTB12	Otter trawl targeting horse mackerel	OTB_MPD_>=55_0_0	
			OTB13	Otter trawl targeting Atlantic mackerel		
		PTB10	PTB11	Pair trawl targeting blue whiting	PTB_MPD_>=55_0_0	CLARA
			PTB12	Pair trawl targeting hake		
			PTB13	Pair trawl targeting Atlantic mackerel		
	Purse seine	PSX10	PSX11	Purse seine targeting sardine	PS_SPF_0_0_0	CLARA
			PSX12	Purse seine targeting horse mackerel		
			PSX13	Purse seine targeting anchovy		
			PSX14	Purse seine targeting Atlantic mackerel		
			PSX15	Purse seine targeting Atlantic chub mackerel		
			PSX1X	Purse seine targeting mix-species		
	Set longline	LLS10	LLS11	Set longline targeting hake	LLS_DEF_0_0_0	CLARA
			LLS12	Set longline targeting european conger		
			LLS13	Set longline targeting pollack		
			LLS14	Set longline targeting seabass		
			LLS15	Set longline targeting forkbeard		
			LLS1X	Set longline targeting mix-species		
	"Volanta"	GNS11	GNS11	Gillnet ("volanta") targeting hake	GNS_DEF_80-99_0_0	DIRECT
	"Rasco"	GNS12	GNS12	Gillnet ("rasco") targeting monkfish	GNS_DEF_>=100_0_0	DIRECT
	Small scale	BET10	BET10	Gillnet targeting mix-species	GNS_DEF_60-79_0_0	CLARA
			XE10	Drifting gillnet targeting sardine	GND_SPF_<40_0_0	
		DRB10	DRB10	Dredge targeting clams	DRB_MOL_0_0_0	CLARA
			DRH10	Dredge targeting common cockle		
		FPO10	FPO11	Traps targeting octopus	FPO_MOL_0_0_0	CLARA
			FPO12	Traps targeting fishes	FPO_FIF_0_0_0	
			FPO13	Traps targeting crustaceans	FPO_CRU_0_0_0	
		GTR10	GTR10	Trammel nets targeting mix-species	GTR_DEF_60-79_0_0	DIRECT
		LHP10	LHP11	Hand line targeting albacore	NO_ICES*	CLARA
			LHP12	Hand line targeting mackerel	LHM_SPF_0_0_0	
			LHP13	Hand line targeting hake	LHM_DEF_0_0_0	
			LHP14	Hand line targeting squid	LHM_CEP_0_0_0	
			LHP1X	Hand line targeting mix-species	LHM_DEF_0_0_0	
		LTL10	LTL10	Trolling lines targeting albacore	NO_ICES*	DIRECT
		PAL10	PAL11	Set longline targeting hake	LLS_DEF_0_0_0	CLARA
			PAL12	Set longline targeting conger		
			PAL13	Set longline targeting pollack		
			PAL14	Set longline targeting seabass		
			PAL15	Set longline targeting greater forkbeard		
			PAL1X	Set longline targeting mix-species		
RAC10		RAC11	Purse seine targeting sardine	PS_SPF_0_0_0	CLARA	
		RAC12	Purse seine targeting horse mackerel			
		RAC13	Purse seine targeting anchovy			
	RAC14	Purse seine targeting Atlantic mackerel				
	RAC15	Purse seine targeting Atlantic chub mackerel				
	RAC1X	Purse seine targeting mix-species				
RECSP	RECSP	Others methods (e.g., commercial dive fisheries...)	RECSP**	DIRECT		
SDN10	SDN10	Danish seining targeting common cuttlefish	SDN_MCF_<55_0_0	DIRECT		
TBB10	TBB10	Beam trawls targeting scallops	TBB_MOL_<55_0_0	DIRECT		

\* Metiers allocation for other projects (ICCAT)

\*\* There is no DCF metier for this group of fishing trips

<sup>7</sup> This hierarchical level is necessary to establish a connection between the fleets and their fishing activity.

Continuation

Fishing ground	Modality	Ug	Metier IEO	Description	Metier DCF	Analytical method	
2 (IXa-south)	Trawl	OTB20	OTB21	Otter trawl targeting Norway lobster	OTB_MCD_>=55_0_0	>10% NEP	
			OTB22	Otter trawl targeting mix-species		DIRECT	
	Purse seine	PSX20	PSX21	Purse seine targeting sardine	PS_SPF_0_0_0	CLARA	
			PSX22	Purse seine targeting anchovy			
			PSX23	Purse seine targeting Atlantic mackerel			
			PSX24	Purse seine targeting Atlantic chub mackerel			
			PSX2X	Purse seine targeting mix-species			
	Small scale	DRB20	DRB20	Dredges targeting clams	DRB_MOL_0_0_0	DIRECT	
		FPO20	FPO20	Traps targeting octopus	FPO_MOL_0_0_0	DIRECT	
		GNS20	GNS20	Gillnets targeting mix-species	GNS_DEF_50-59_0_0	DIRECT	
		GTR20	GTR20	Trammel nets targeting mix-species	GTR_DEF_50-59_0_0	DIRECT	
		HMD20	HMD20	Mechanized dredges targeting striped venus	HMD_MOL_0_0_0	DIRECT	
		LLS20	LLS21	LLS21	Hand line targeting seabream	LHM_DWS_0_0_0	CLARA
			LLS22	LLS22	Set longline targeting silver scabbardfish	LLS_DWS_0_0_0	
LLS2X	LLS2X		Set longline targeting mix-species	LLS_DEF_0_0_0			

Fishing ground	Modality	Ug	Metier IEO	Description	Metier DCF	Analytical method	
5 (VI, VII and VIIIabde)	Trawl	OTB50	OTB51	Otter trawl targeting megrims	OTB_DEF_70-99_0_0	DIRECT	
			OTB52	Otter trawl targeting hake	OTB_DEF_100-119_0_0		
			OTB53	Otter trawl targeting Norway lobster	OTB_DEF_100-119_0_0		
			OTB54	Otter trawl targeting hake (ICES VIa)	OTB_DEF_100-119_0_0		
			OTB55	OTB55	Otter trawl targeting mix-species (ICES divisions VIIIabd)	OTB_DEF_>=70_0_0	DIRECT
				OTB55	Otter trawl targeting pelagic and demersal fishes (ICES divisions VIIIabd)	OTB_MPD_>=70_0_0	
				OTB55	Otter trawl targeting small pelagic fish (ICES divisions VIIIabd)	OTB_SPF_>=70_0_0	
				OTB55	Otter trawl targeting cephalopods and demersal fishes (ICES divisions VIIIabd)	OTB_MCF_>=70_0_0	
			OTB56	OTB56	Otter trawl targeting monkfish (ICES divisions VIIIabd)	OTB_DEF_>=70_0_0	DIRECT
			PTB50	PTB50	Pair trawl targeting hake (ICES divisions VIIIabd)	PTB_DEF_>=70_0_0	DIRECT
	Fixed fishing gear	LLS50	LLS51	Set longline targeting hake	LLS_DEF_0_0_0	CLARA	
			LLS52	Set longline targeting european conger	LLS_DEF_0_0_0	CLARA	
			LLS53	Set longline targeting forkbeard	LLS_DEF_0_0_0	CLARA	
			LLS5X	Set longline targeting mix-species	LLS_DEF_0_0_0	CLARA	
GNS50	GNS50	GNS50	Gillnet targeting hake (ICES divisions VIIbcjk)	GNS_DEF_120-219_0_0	DIRECT		
		GNS50	Gillnet targeting hake (ICES divisions VIIIabd)	GNS_DEF_>=100_0_0			
6 <sup>8</sup> (VIIIabde)	Fixed fishing gear	LLS60	LLS61	Set longline targeting hake (ICES divisions VIIIabd)	LLS_DEF_0_0_0	CLARA	
			LLS62	Set longline targeting european conger (ICES divisions VIIIabd)	LLS_DEF_0_0_0	CLARA	
			LLS63	Set longline targeting forkbeard (ICES divisions VIIIabd)	LLS_DEF_0_0_0	CLARA	
			LLS6X	Set longline targeting mix-species (ICES divisions VIIIabd)	LLS_DEF_0_0_0	CLARA	
		GNS60	GNS60	Gillnet targeting hake (ICES divisions VIIIabd)	GNS_DEF_>=100_0_0	DIRECT	
7 (IXa-Portugal)	Trawl	OTB70	OTB71	Otter trawl in the northern of parallel 39°N (in waters under Portugal jurisdiction)	OTB_DEF_>=55_0_0	DIRECT	
			OTB72	Otter trawl in the southern of parallel 39°N (in waters under Portugal jurisdiction)	OTB_MCD_>=55_0_0	DIRECT	
	Set longline	LLS70	LLS70	Set longline targeting Atlantic pomfret (in waters under Portugal jurisdiction)	LLS_DEF_0_0_0	DIRECT	

<sup>8</sup> The Spanish administration maintains a specific census for vessels under 100 GRT

## Continuation

Id	Metier DCF	Definition	Description
1	DRB_MOL_0_0_0	Dredges targeting molluscs	Dredges targeting molluscs and bivalves in the ICES divisions IXa and VIIIc
2	FPO_CRU_0_0_0	Traps targeting crustaceans	Traps targeting crustaceans in the northern of the ICES division IXa
3	FPO_FIF_0_0_0	Traps targeting fishes	Traps targeting fishes in the northern of the ICES division IXa
4	FPO_MOL_0_0_0	Traps targeting cephalopods	Traps targeting cephalopods in the ICES divisions IXa and VIIIc
5	GNS_DEF_50-59_0_0	Gillnets targeting demersal fishes with mesh size between 40 y <60 mm	Gillnets of the small-scale fleet in the southern of the ICES division IXa
6	GNS_DEF_60-79_0_0	Gillnets targeting demersal fishes with mesh size between 60 y <80 mm	Gillnets (" <i>betas</i> ") of the small-scale fleet in the northern of the ICES division IXa
7	GNS_DEF_80-99_0_0	Gillnets targeting demersal fishes with mesh size between 80 y <100 mm	Gillnet (" <i>volanta</i> ") in the northern of the ICES division IXa
8	GNS_DEF_>=100_0_0	Gillnets targeting demersal fishes with minimum mesh size of 100 mm	Gillnet (" <i>rasco</i> ") in the northern of the ICES division IXa and ICES divisions VIIIabd
9	GNS_DEF_120-219_0_0	Gillnets targeting demersal fishes with mesh size between 120 y <220 mm	Gillnet in ICES subarea VII
10	GTR_DEF_50-59_0_0	Trammel nets targeting demersal fishes with mesh size between 40 y <60 mm	Trammel net in the southern of the ICES division IXa
11	GTR_DEF_60-79_0_0	Trammel nets targeting demersal fishes with mesh size between 60 y <80 mm	Trammel net in the northern of the ICES division IXa
12	HMD_MOL_0_0_0	Mechanized dredges targeting molluscs	Mechanized dredges in the southern of the ICES division IXa
13	LHM_CEP_0_0_0	Hand line targeting cephalopods	Hand line targeting squid in the northern of the ICES division IXa
14	LHM_DEF_0_0_0	Hand line targeting demersal fishes	Hand line targeting hake in the northern of the ICES division IXa
15	LHM_DWS_0_0_0	Hand line targeting deep-sea fish	Hand line (" <i>voracera</i> ") targeting seabream in the southern of the ICES division IXa
16	LHM_SPF_0_0_0	Hand line targeting small pelagic fish	Hand line targeting mackerel in the northern of the ICES division IXa
17	LLS_DEF_0_0_0	Set longline targeting demersal fishes	Set longline in Iberian and Community waters
18	LLS_DWS_0_0_0	Set longline targeting deep-sea fish	Set longline targeting silver scabbardfish in the southern of the ICES division IXa
19	OTB_DEF_>=55_0_0	Otter trawl targeting demersal fishes with minimum mesh size of 55 mm	Otter trawl targeting demersal fishes in the northern of the ICES division IXa (included Portugal waters)
20	OTB_DEF_>=70_0_0	Otter trawl targeting demersal fishes with minimum mesh size of 70 mm	Otter trawl in the ICES divisions VIIIabd
21	OTB_DEF_70-99_0_0	Otter trawl targeting demersal fishes with mesh size between 70 y <100 mm	Otter trawl targeting flat fishes in Community waters
22	OTB_DEF_100-119_0_0	Otter trawl targeting demersal fishes with mesh size between 100 y <120 mm	Otter trawl targeting hake in Community waters
23	OTB_MCD_>=55_0_0	Otter trawl targeting demersal fishes and crustaceans with minimum mesh size of 55 mm	Otter trawl in the southern of the ICES division IXa (included Portugal waters)
24	OTB_MCF_>=70_0_0	Otter trawl targeting cephalopods and fishes with minimum mesh size of 70 mm	Otter trawl in the ICES divisions VIIIabd
25	OTB_MPD_>=55_0_0	Otter trawl targeting pelagic and demersal species with minimum mesh size of 55 mm	Otter trawl targeting in the northern of the ICES division IXa
26	OTB_MPD_>=70_0_0	Otter trawl targeting pelagic and demersal species with minimum mesh size of 70 mm	Otter trawl in the ICES divisions VIIIabd
27	OTB_SPF_>=70_0_0	Otter trawl targeting small pelagic fishes with minimum mesh size of 70 mm	Otter trawl in the ICES divisions VIIIabd
28	PS_SPF_0_0_0	Purse seine targeting small pelagic fishes	Purse seine in the ICES divisions IXa and VIIIc
29	PTB_DEF_>=70_0_0	Pair trawl targeting demersal fishes with minimum mesh size of 70 mm	Pair trawl in the ICES divisions VIIIabd
30	PTB_MPD_>=55_0_0	Pair trawl targeting mix pelagic and demersal species with minimum mesh size of 55 mm	Pair trawl in the ICES division IXa
31	SDN_MCF_<55_0_0	Danish seining targeting molluscs and fishes	Danish seining in the northern of the ICES division IXa
32	TBB_MOL_<55_0_0	Beam trawl targeting molluscs with minimum mesh size of 55 mm	Beam trawl in the northern of the ICES division IXa
33	GND_SPF_<40_0_0	Drifting gillnet targeting sardine	Drifting gillnet (" <i>xeitor</i> ") in the northern of the ICES division IXa

Tabla 4. Specialization: number of fishing vessels by length (LOA) and gear categories.

		LOA (m)						
		VL0010	VL1012	VL1218	VL1824	VL2440	VL40XX	
		< 10	10- <12	12- <18	18- <24	24- <40	> 40 m	
Fishing gear categories	DFN	Gillnets and trammel nets	DFN0010 (number of vessels)	DFN1012 (number of vessels)	DFN1218 (number of vessels)	DFN1824 (number of vessels)	DFN2440 (number of vessels)	DFN40XX (number of vessels)
	DRB	Dredges	DRB0010 (number of vessels)	DRB1012 (number of vessels)	DRB1218 (number of vessels)	DRB1824 (number of vessels)	DRB2440 (number of vessels)	DRB40XX (number of vessels)
	DTS	Trawls	DTS0010 (number of vessels)	DTS1012 (number of vessels)	DTS1218 (number of vessels)	DTS1824 (number of vessels)	DTS2440 (number of vessels)	DTS40XX (number of vessels)
	FPO	Pots and Traps	FPO0010 (number of vessels)	FPO1012 (number of vessels)	FPO1218 (number of vessels)	FPO1824 (number of vessels)	FPO2440 (number of vessels)	FPO40XX (number of vessels)
	HOK	Hooks	HOK0010 (number of vessels)	HOK1012 (number of vessels)	HOK1218 (number of vessels)	HOK1824 (number of vessels)	HOK2440 (number of vessels)	HOK40XX (number of vessels)
	PGO	Others polyvalent gears	PGO0010 (number of vessels)	PGO1012 (number of vessels)	PGO1218 (number of vessels)	PGO1824 (number of vessels)	PGO2440 (number of vessels)	PGO40XX (number of vessels)
	PGP	Polyvalent gears	PGP0010 (number of vessels)	PGP1012 (number of vessels)	PGP1218 (number of vessels)	PGP1824 (number of vessels)	PGP2440 (number of vessels)	PGP40XX (number of vessels)
	PSX	Purse seine	PSX0010 (number of vessels)	PSX1012 (number of vessels)	PSX1218 (number of vessels)	PSX1824 (number of vessels)	PSX2440 (number of vessels)	PSX40XX (number of vessels)
TBB	Beam trawl	TBB0010 (number of vessels)	TBB1012 (number of vessels)	TBB1218 (number of vessels)	TBB1824 (number of vessels)	TBB2440 (number of vessels)	TBB40XX (number of vessels)	