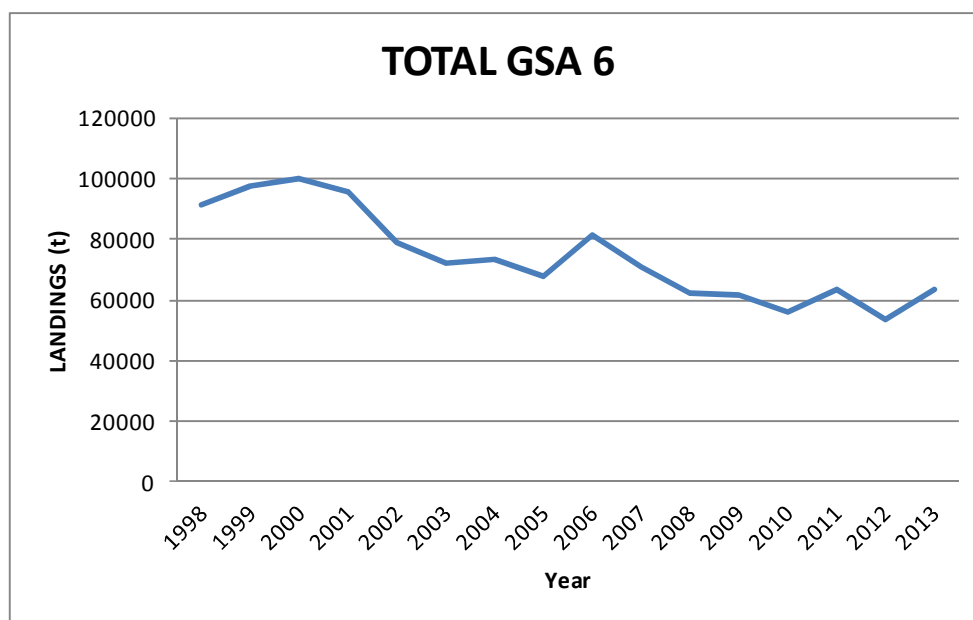


## **NORTH-WESTERN MEDITERRANEAN WATERS**

### **General description**

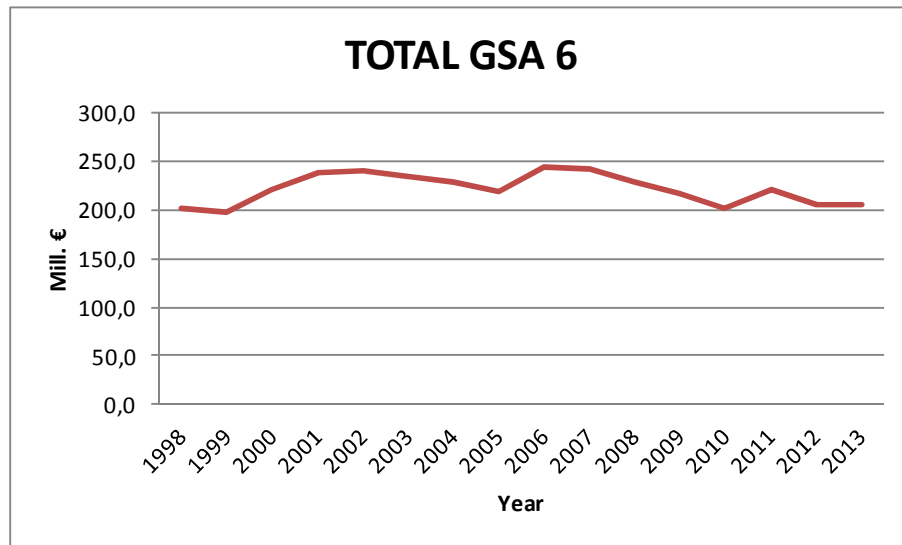
Although low primary production in the Mediterranean determines that fisheries are not of great importance from the point of view of catches, fishing has a long tradition, which combined with the diversity of habitats has led to the variety of fisheries that we can currently observe. Moreover, although the amount of catches is relatively moderate compared to other marine areas of high productivity, the fact that the Mediterranean coast is an area of great tourist importance means that, in general, the commercial value of the species caught be high.

For example, the total landings, accounting for all species in the GSA 6 show a decreasing trend in the period studied (1998-2013). Starting from a peak of nearly 100 000 t in 2000, slowly decreasing to 63 000 t in 2013, with an average of 75 000 t in the considered period.



**Figure 1.1** Total landings evolution in GSA 6 in the period comprised between 1998 and 2013.

Moreover, despite the decline in landings, economic volume generated by them at first auction shows greater stability in the same period, with an average total value of 221 million Euros per year.



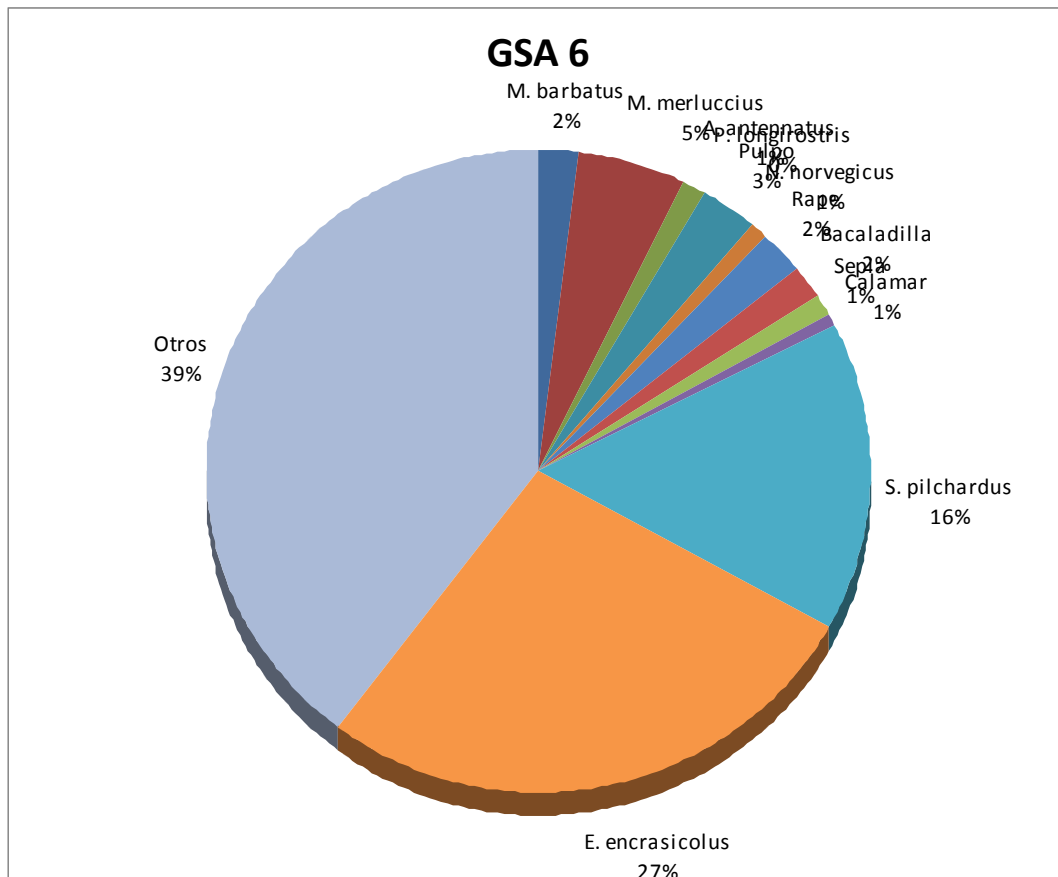
**Figure 1.2** Evolution of total value of landings in GSA 6 in the period comprised between 1998 and 2013.

### Species composition

In the case of pelagic fisheries target species are sardine (*Sardina pilchardus*) and anchovy (*Engraulis encrasicolus*). In the case of demersal trawl fisheries, hake (*Merluccius merluccius*), red mullet (*Mullus spp*), white shrimp (*Parapenaeus longirostris*), red shrimp (*Aristeus antennatus*), Norway lobster (*Nephrops norvegicus*), the octopus (*Octopus vulgaris*) and anglerfish (*Lophius spp.*) are the target species.

Benthic and demersal species are exploited by the semi-industrial trawler fleets as well as artisanal vessels. Artisanal fisheries are characterized by high diversity of species caught and by the absence of large monospecific stocks. Although the number of artisanal vessels is important in some areas with high social impact, catches account for only a very small part of the total. Overall, artisanal fishing is characterized by the diversity of fishing gears and caught species, the high market value thereof, almost no incidence of discards and the form of exploitation of resources, more selective and adapted to the seasonal changes of abundance. The dominant gears are fishing gillnets (trammel nets)

and entangle nets (monofilament nets). There are several varieties of trammel according to the target species as the common octopus (*Octopus vulgaris*), cuttlefish (*Sepia officinalis*), red mullet (*Mullus spp.*) or different species of sea bream.



**Figure 1.3.** Species contribution to the total landings in GSA 6, observed in 2013.

The main species are anchovy and sardine. Other small pelagic species, with lower economical value are also landed, but rarely they are target species and almost always represent a rather low percentage of the total landings: the Mediterranean mackerel and the horse mackerels (*Trachurus mediterraneus* and *T. trachurus*), the mackerel and the chub mackerel (*Scomber scombrus* and *S. japonicus*), and the gilt sardine (*Sardinella aurita*) are the most important ones.

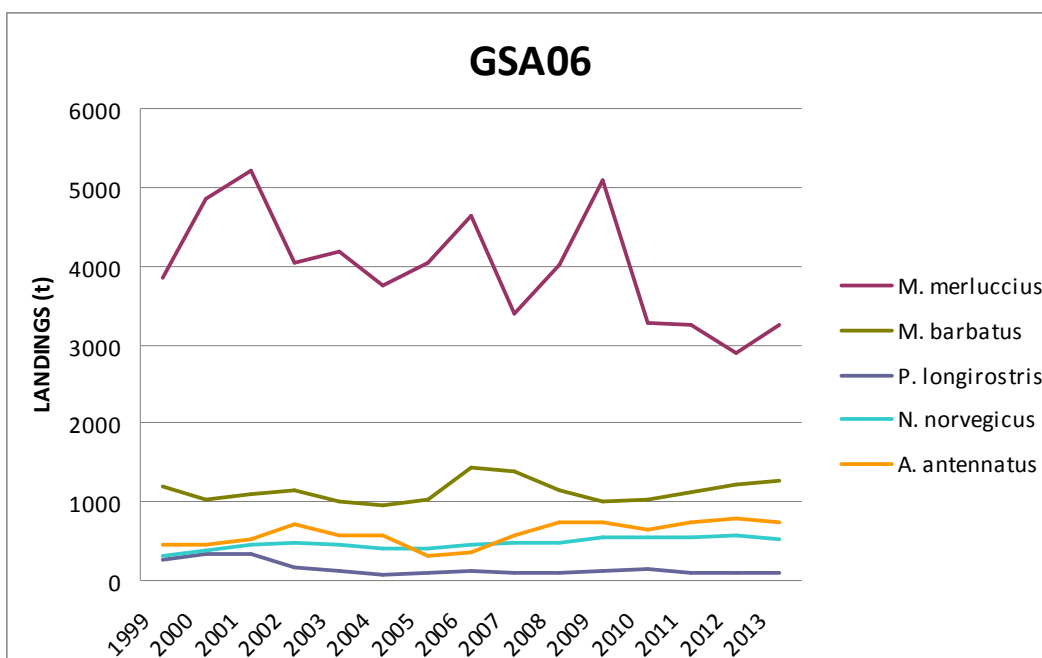
Most of the landings of demersal species come from the bottom trawl fleets. The multispecies nature of the bottom trawl fishery is evident if we consider that

catches can eventually identify more than 600 species from different taxonomic groups. Consequently, the proportion of discards is very high, up to 77% of species and 30-40% of the total weight caught. The exploitation extends to both the platform and the continental slope; the predominant species at landings vary with depth.

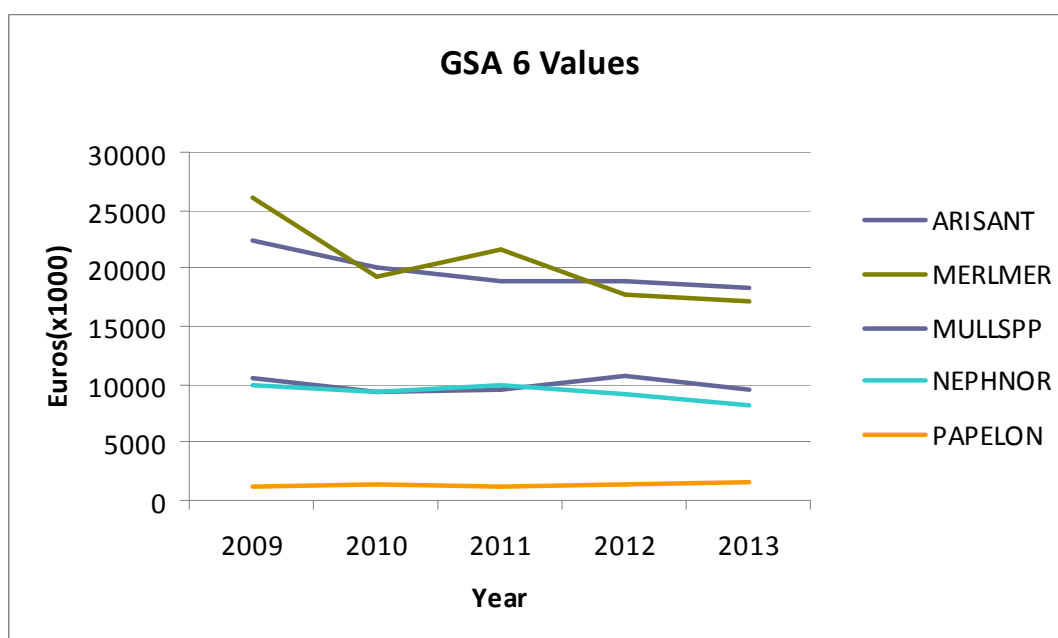
In the case of demersal species the fleet segmentation consists of three metiers:

1. Mixed Demersal species (typically vessels 6-18 meters), with a value of landings in 2009 of €33 million, with a net profit per vessel around €25.000. The employment on board was 642 FTE.
2. Mixed Demersal and red shrimps species, both taking place on the shelf and shelf break (typically vessels 18-24 meters and operating in the upper slope of continental shelf), the value of landings in 2009 was €97 million, with a net profit per vessel around €15.000. The employment on board was 1975 FTE in 2009.
3. Red shrimp fisheries operated on the slope up to 400 m depth (length category 24-40m). The value of landings in 2009 was €65 million, yielding significant losses. The employment on board was 987 FTE in 2009.

The Principal target species for the “Mixed Demersal” and “Mixed Demersal and red shrimps” fleet segments are Red mullets (*Mullus surmuletus*, *M. barbatus*); Octopus (*Octopus vulgaris*) Horse mackerels (*Trachurus trachurus*, *T. mediterraneus*); European hake (*Merluccius merluccius*); Monkfish (*Lophius piscatorius*) Anglerfish (*L. budegassa*); White shrimp (*Parapenaeus longirostris*) and Norway lobster, (*Nephrops norvegicus*). While for the “red shrimps” fleet segment the target species is the red shrimp (*Aristeus antennatus*).



**Figure 1.4.** Evolution of landings of the main demersal species in GSA 6 in the period comprised between 1999 and 2013.

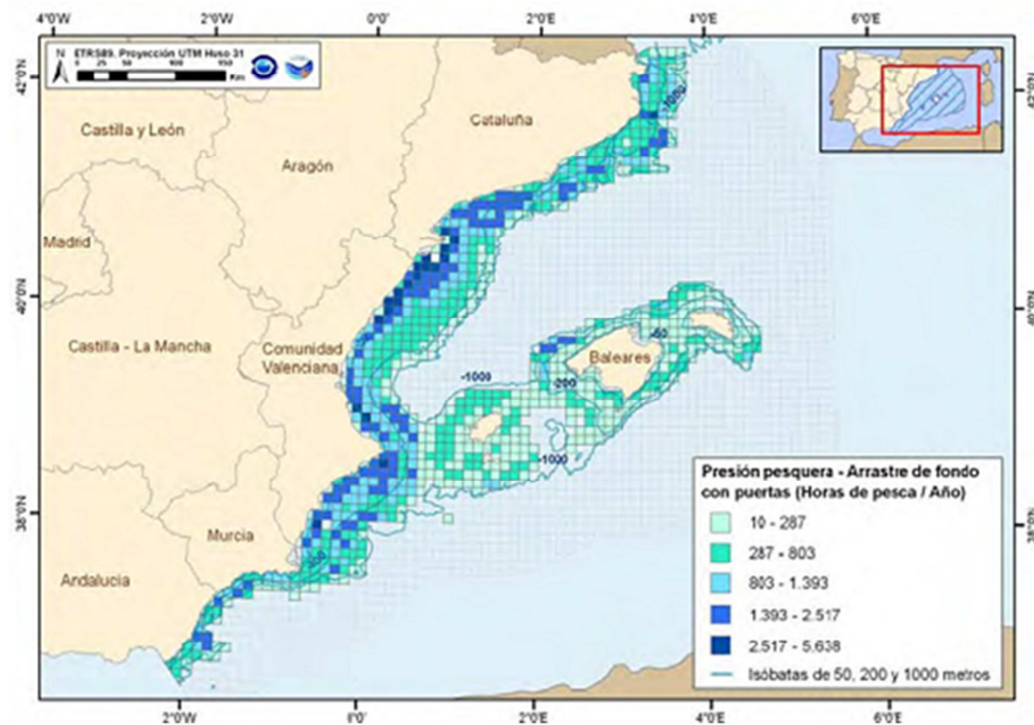


**Figure 1.5.** Evolution of economic value of the main demersal species in GSA 6 in the period comprised between 2009 and 2013.

Economically, the red shrimp is the most important species in the trawl fishery, contributing between 30 and 50% of the total incomes for the trawl fleet. However the contribution in weight is lower, between 5 and 20% depending on the area.

## Fishery

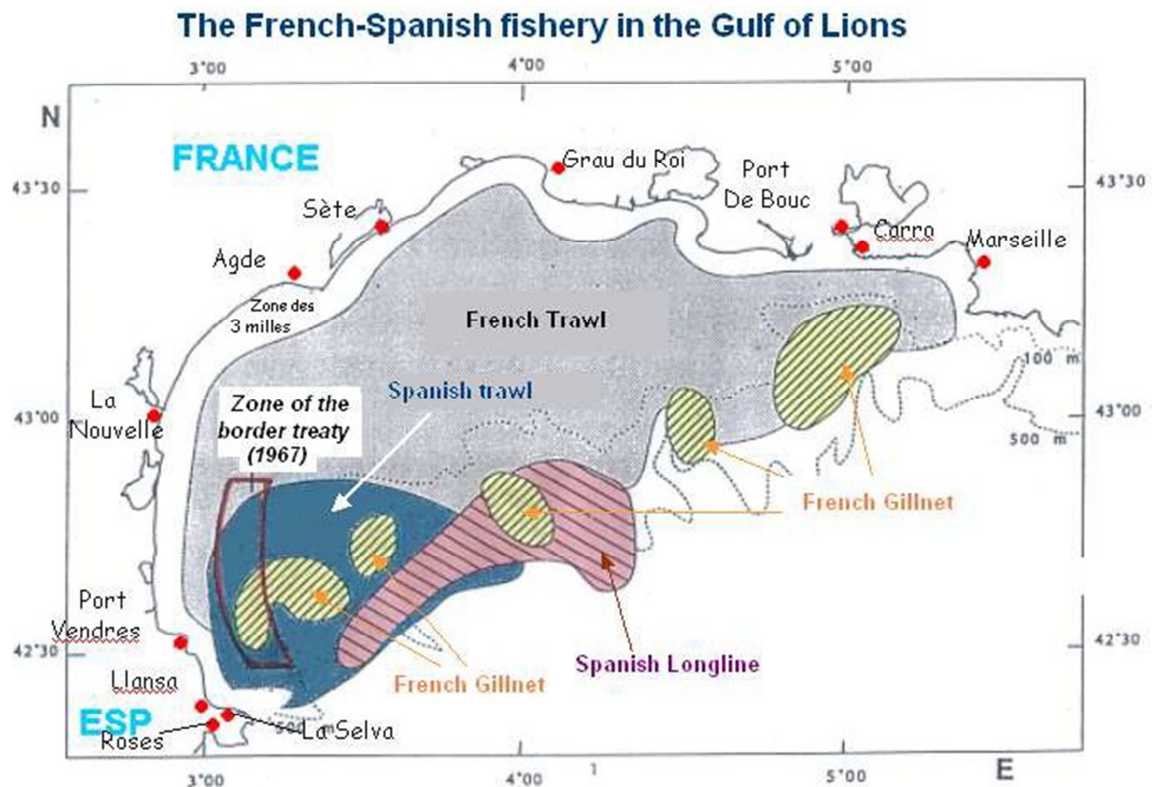
The trawl fleet previously undertook daily trips, although some vessels are able to undertake trips lasting between two and four days. The number of hauls in a single daily trip is between 1 and 5. In average the number of sea days by boat is between 100 and 190 days, but typically around 140-160 days.



**Figure 1.6.** Spatial distribution of the cumulated effort (total hours by year) for the OTB fleet in GSA 6.

Discard rates for target species such as red shrimp, white shrimp, mullets and octopus are very low, typically less than 10% for fish species and lower for the two shrimp species (<2%). One species of the group of octopuses (*Eledone moschata*) have been one high sporadic discard. Discards of mullet and red mullet in Spanish Mediterranean waters are quite inexistent due to their high market value.

The Gulf of Lions supports fisheries that include bottom and pelagic trawls, purse seines, gill nets and longlines, and is furthermore an important spawning area for many pelagic and demersal species. The demersal fisheries are multi-species and multi-gears fisheries. The marine living resources of the Gulf of Lions are a “shared stock” which is essentially exploited by French and Spanish fishing boats. The main part of the fishing grounds exploited by these boats cover the entire continental shelf from the coastline to the 200 metres isobath, with an area of some 14 000 square kilometres covered by sandy deposits. This particular geomorphology has been conducive to the development of trawling there. Off the French coasts, the Spanish fishing activity was confined at first in a restricted zone included between 6 and 12 miles, from the French-Spanish border up to Cap Leucate (the so called "zone of the border treaty" 1967-68). At the beginning of the 80s this activity extended offshore and to the east of the continental shelf.



**Fig.1.7-** The fishing sectors of the various components of the French-Spanish fleet

## The fleet

The fishing activities (métiers) considered for reporting catch and effort data in the GSA 06 are shown in the following table:

Gear Group	Metier	Target species
Bottom otter trawl	OTB-DES	Demersal species
	OTB-DWS	Deep water species
	OTB-MDD	Mixed demersal and deep water species
Trammel nets	GTR-DES	Demersal species
Pots and Traps	FPO	Demersal species
Surrounding nets	PS-SPF. Purse seine	Small pelagic species
	PS-LPF. Purse seine	Large pelagic species
Longlines	LLD. Drifting longline	Large pelagic species
	LLS. Set longline	Demersal species

According to the more recent data of the Spanish Ministry Fleet register, the total fleet in the GSA06 accounts for a total of 1313 vessels. The fleet is composed mainly by artisanal vessels between 6 and 12 m of Overall length (LOA), and trawlers between 18 and 24 m of Overall length (Table 1.2.1).

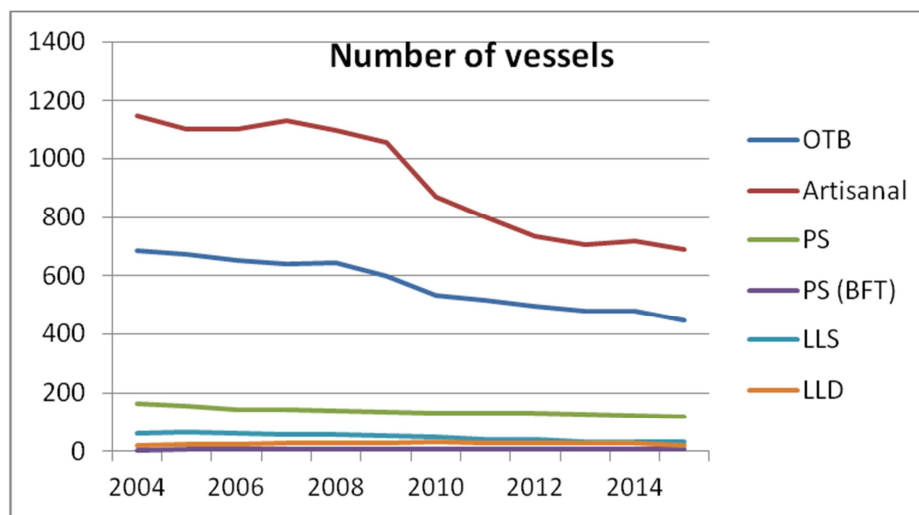


**Table 1.2.** GSA06 Mediterranean fleet. Source of data: Spanish Ministry fleet register (January 2015)

	Vessel Length	Nº vessels	Average GT	Average LOA	Average Kw
<b>Artisanal fleet</b>	VL<06	57	0.96	5.36	13.23
	VL0612	533	3.78	8.79	52.38
	VL1218	97	11.10	13.23	95.27
	VL1824	-	-	-	-
	VL2440	2	197.75	27.00	570.00
	<b>Total</b>	<b>689</b>	<b>5.14</b>	<b>9.18</b>	<b>56.88</b>
<b>Otter bottom trawl</b>	VL0612	15	8.35	10.33	47.20
	VL1218	111	24.15	15.56	99.11
	VL1824	215	58.95	21.10	262.05
	VL2440	107	99.28	25.54	430.43
	<b>Total</b>	<b>448</b>	<b>58.27</b>	<b>20.43</b>	<b>254.70</b>
<b>Purse seine</b>	VL0612	3	5.97	10.64	87.00
	VL1218	36	27.12	16.25	236.78
	VL1824	59	46.26	20.78	307.04
	VL2440	20	76.07	25.20	379.70
	<b>Total</b>	<b>118</b>	<b>44.45</b>	<b>19.89</b>	<b>292.33</b>
<b>Purse seine (BFT)</b>	VL2440	4	228.19	36.31	1175.75
	VL>40	2	349.80	43.43	1622.00
	<b>Total</b>	<b>6</b>	<b>268.73</b>	<b>38.68</b>	<b>1324.50</b>
<b>Set longline</b>	VL0612	21	4.29	9.01	75.05
	VL1218	10	14.39	13.29	140.50
	VL1824	1	33.69	18.00	270.00
	<b>Total</b>	<b>32</b>	<b>8.36</b>	<b>10.63</b>	<b>101.60</b>
<b>Drifting longline</b>	VL1218	16	14.95	13.97	89.12

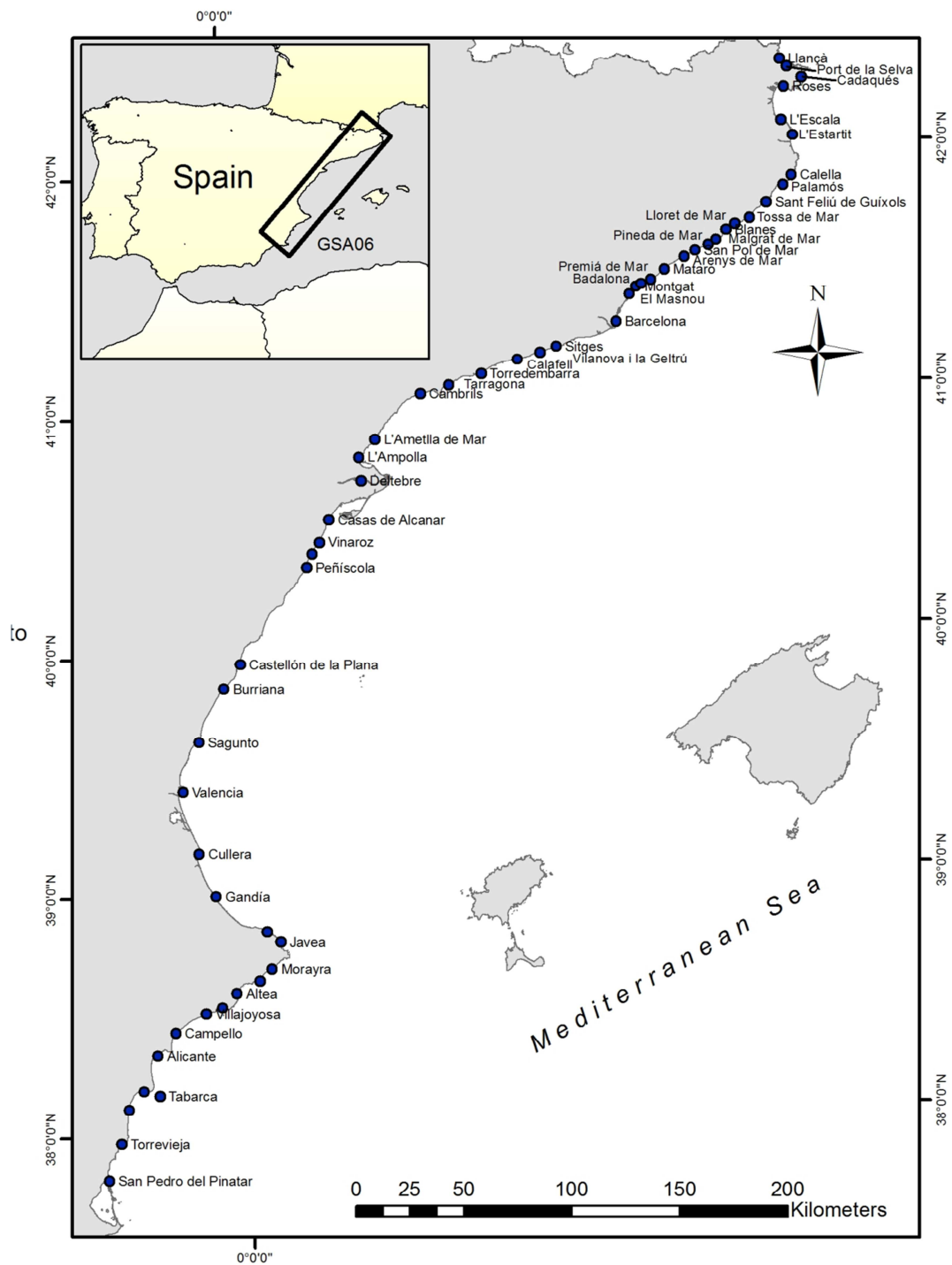
VL1824	4	47.76	19.40	225.75
<b>Total</b>	<b>20</b>	<b>21.51</b>	<b>15.06</b>	<b>116.45</b>
<b>TOTAL</b>	<b>1313</b>	<b>28.33</b>	<b>14.24</b>	<b>153.62</b>

The number of vessels in this area has been continuously decreasing in the last decade, from more than 2080 vessels in 2004 to 1313 in 2015. The biggest reductions have taken place in the set longliners, the artisanal fleet and the bottom trawlers. Also the purse seine fleet has been continuously decreasing, from 164 vessels in 2004 to 118 in 2015. The number of drifting longliners and the purse seine for bluefin tuna is constant in this years (Figure 1.2.1).



**Figure 1.8.** Evolution of the number of vessels in the GSA06. OTB: Bottom otter trawl; Artisanal: artisanal fleet; PS: purse seine; PS (BFT): purse seine for bluefin tuna; LLS: set longline; LLD: drifting longline.

The fleet is distributed in 54 ports along the coast, while 28 of them have less than 15 operative vessels. As concerns the number of vessels, the main harbours in the GSA06 are San Carlos de la Rápita, Santa Pola, Vilanova I la Gertrú, San Pedro del Pinatar, Ametlla de Mar and Blanes (Tab. 1.2.2).



**Figure 1.9** – Fishing ports location along the GSA 6 coast.

**Table 1.3.** - Ports and number of vessels by fleet. Source of data: Spanish Ministry fleet register (January 2015)

Port	Artisanal	OTB	PS	PS (BFT)	LLS	LLD	Total
Altea	5	10	2				17
Ametlla de Mar	19	21	7	6	1	1	55
Arenys de Mar	31	14	7			1	53
Barcelona	1	13	21				35
Benicarló	10	19					29
Blanes	22	18	6		4	4	54
Burriana	17	7	5			1	30
Calpe	5	15					20
Cambrils	9	17	4				30
Castellón	16	16	14			3	49
Cullera	33	14			2		49
Denia	13	17	1			2	33
Gandía	40	6					46
Jávea	8	6	4				18
La Escala	14		6		2		22
Palamós	14	25	4		5	1	49
Peníscola	14	25			1		40
Roses	23	19	6		4		52
San Carlos de la Rápita	41	46					87
San Pedro del Pinatar	54	1	1				56
Santa Pola	51	29					80

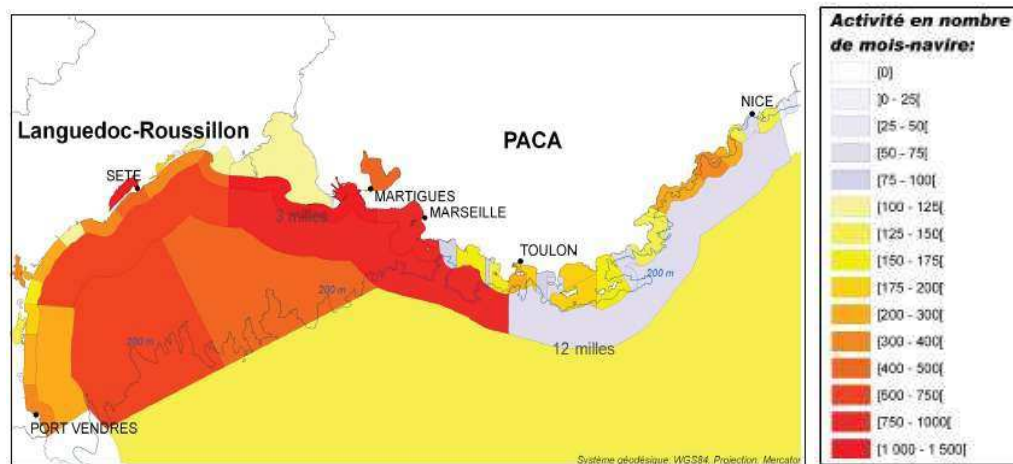
<b>Tarragona</b>	10	31	9		1	1	52
<b>Valencia</b>	13	5					18
<b>Vilanova i la Geltru</b>	30	22	9		7	3	71
<b>Villajoyosa</b>	11	29					40
<b>Vinaroz</b>	19	10	3				32
<b>Others (28 minor ports)</b>	166	13	9		5	3	196
<b>TOTAL</b>	<b>689</b>	<b>448</b>	<b>118</b>		<b>32</b>	<b>20</b>	<b>1313</b>

The boats exploiting the marine resources of the Gulf of Lions (GSA 7) are mainly based in the French ports of Sète and Le Grau du Roi which group more than 60 % of the boats and insure about 70 % of the halieutic production of the Gulf of Lions and in the Spanish ports of Roses and Port de la Selva. (42). In 2010, 220 boats were involved in the demersal fishery: 111 French bottom trawlers, 67 French gillnetters, 27 Spanish bottom trawlers and 15 Spanish long-liners (tab.1), while 14 French purse seiners and 6 Spanish ones where fishing small pelagics in 2007-2008. Both fleets are subject to the rules of the EC Common Fisheries Policy, concretely to the management framework established by Council Regulation No 1967/2006 concerning management measures for the sustainable exploitation of fishery resources in the Mediterranean Sea.

Country	Gear	Target sp.	nº of boats	Contribution
FR	Trawl	Demersal	111	50,45%
FR	Gillnet	Demersal	67	30,45%
SP	Trawl	Demersal	27	12,27%
SP	Longline	Demersal	15	6,82%

**Tab.1.4-** Composition of the French-Spanish fleet in 2010

French trawlers are the main component of the fleet exploiting the marine resources of the Gulf of Lions. This fleet can be divided into two main components, one (around 50 boats) directed to the catch of small pelagic species (mainly anchovy *Engraulis encrasicolus* and sardine *Sardina pilchardus*), the other characterised by the exploitation of a great diversity of demersal species.



Activité 2006 des navires de pêche de la région Languedoc-Roussillon © Ifremer, Juillet 2008

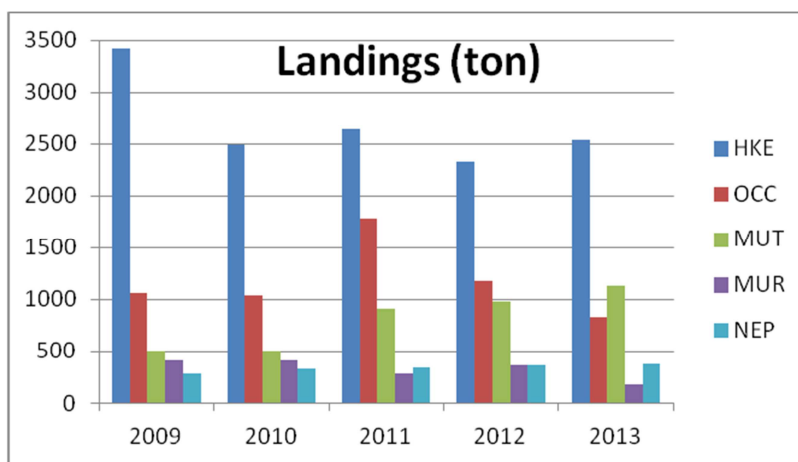
**Fig.1.10-** Spatial distribution of the activity of the French fleet in 2006

## Main fisheries in GSA 6

Following the DCF criteria (EU, 2010), landings, effort and economic value of landings could be the criteria to select the main métier in an area. Applying this criteria, the main métier in the GSA06 will be bottom otter trawl targeting demersal species, bottom otter trawl targeting deep water species, purse seine targeting small pelagics, set longline targeting demersal species, trammel net targeting demersal species and gillnet targeting demersal species (Spanish National programme 2011-2013).

### Bottom otter trawl targeting demersal species

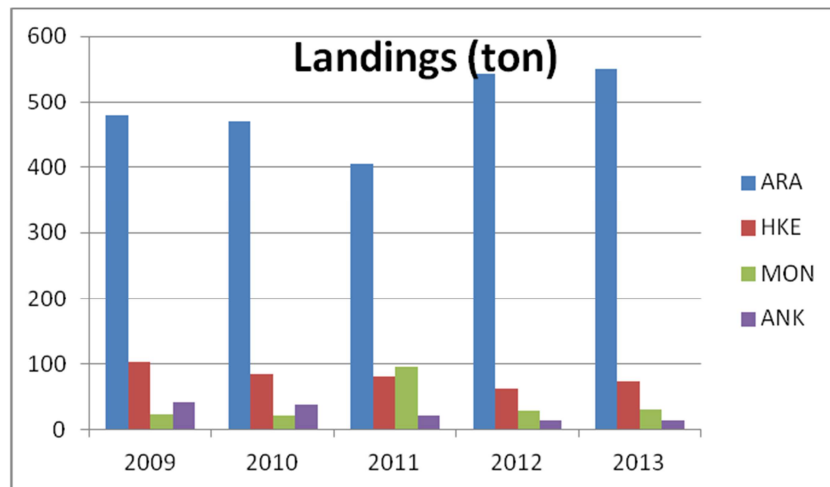
*Merluccius merluccius*, *Mullus barbatus*, *Mullus surmuletus*, *Nephrops norvegicus* and *Octopus vulgaris* are the most commercially valuable species in the area and are an important component of a species assemblage that is the target of the bottom trawling fleets operating near shore.



**Figure 1.11.** Landings of the target species in the métier OTB\_DEF. Source of data: Mediterranean data call 2014

### Bottom otter trawl targeting deep water species

*Aristeus antennatus* is the only target species of this métier. The bycatch is composed by *Lophius spp* and *Merluccius merluccius*.



**Figure 1.12.** Landings of the target species in the métier OTB\_DWS. Source of data: Mediterranean data call 2014

#### Purse seine targeting small pelagics

*E. encrasicholus* is the main target species of the purse seine fleet in Northern Spain, due to its high economic value. Catches in the period 1990-2012 has been highly variable (mean average value of 11500 tons), with a minimum of 2800 tons in 2007. Higher catches occurred in the period 1990-94, with values between 17000 and 22000 tons. The years with higher landings are usually correlated with a success of recruitment.

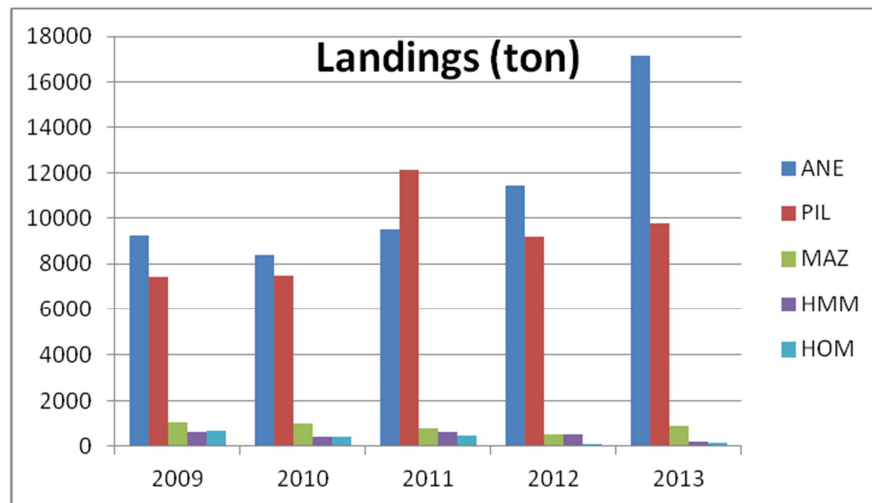
Sardine, even if with a lower price than anchovy, was an important support for this fishery until 2009 as it was the most fished species. In the period 1990-2012 sardine landings showed a decreasing trend, from 53000 t in 1994 to 9000 t in 2012. The whole period yearly average is 30000 tons.

The fishery is active throughout all the year, but the activity is higher in summer. In December and January there is the seasonal closure of the fishery. The main fishing grounds for anchovy are located in the Ebro Delta and the Rosas Bay, those for sardine are distributed throughout all the area.

Several species with a lower economical value are also caught, however they represent a low percentage of landings: the most abundant ones are *Trachurus* spp. *Scomber* spp. and *Sardinella aurita*.

The percentage of total discard (all species) in the purse seine fleet in GSA 6 ranges from 1% to 5%, depending of the year (pilot study 2003 and 2004 respectively). Discards are mainly composed of species with low or without economic value, like *B. boops* and *S. aurita*.



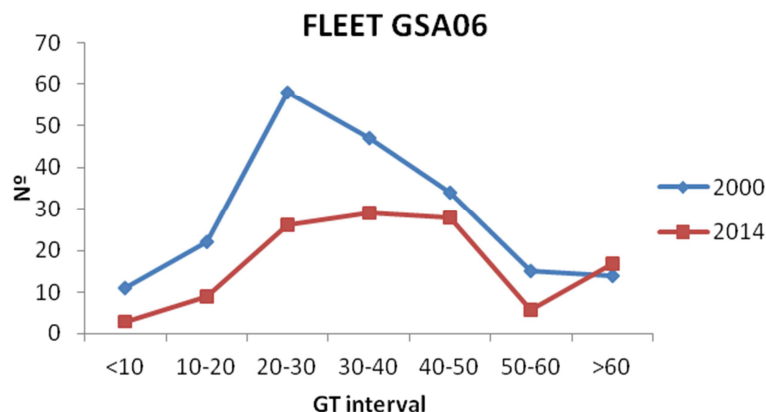


**Figure 1.13.** Landings of the target species in the métier PS\_SPF. Source of data: Mediterranean data call 2014

The current fleet of GSA 6 (Northern Spain) in 2014 is composed by 118 units, with an average GT of 39.5 (Table 3). Also in this area the purse seine fleet has been continuously decreasing in the last two decades, from 222 vessels in 1990 to 118 in 2014. Between 2000 and 2014 has been lost 48.6% of the boats smaller than 40 GT (Fig. 9).

**Table1.4..** Mediterranean Spanish small pelagic fleet LOA interval. Source of data: Spanish Ministry fleet register (2014). PS = purse seine.

Metier	Vessel Length	nº vessels	Average GT	Average LOA	Average kW
PS	VL0612	3	6.7	10.6	87
	VL1218	37	25.6	16.3	236.9
	VL1824	59	40.9	20.9	308.9
	VL2440	19	67.8	25.3	381.3
<b>Total</b>		118	39.5	19.9	292.3



**Figure1.14.** Fleet GSA06 2000 and 2014 by GT interval.

The fleet is distributed in 19 ports in GSA 6. As concerns the number of vessels, the main harbours in the GSA 6 are Barcelona, Castellón, Tarragona y Vilanova (Table 4). This table shows the average technical characteristics for each of the ports from the North to the South ones.

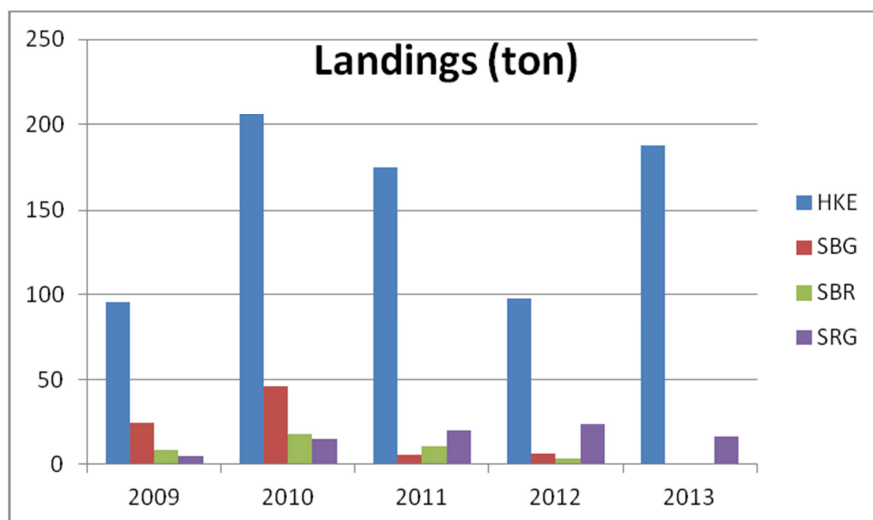
**Table 1.5.** Ports, number of vessels and technical characteristics of the small pelagic fleet in GSA06.

GSA 06 2014		GT			Kw			LOA	
Port	Vessels	Total	Mean	SD	Total	Mean	SD	Mean	SD
Roses	6	254.0	42.3	21.5	1920.0	320.0	130.6	20.1	5.5
L'Escala	6	97.9	16.3	7.8	971.0	161.8	82.5	15.2	2.3
Palamós	4	119.8	29.9	5.8	907.0	226.8	55.7	16.4	1.5
San Feliú de Guisols	4	146.5	36.6	17.3	1196.0	299.0	68.7	19.4	1.4
Blanes	6	188.9	31.5	5.2	1306.9	217.8	60.4	19.7	2.0
Arenys de Mar	7	304.8	43.5	18.3	2450.0	350.0	57.7	20.8	3.4
Barcelona	21	795.3	37.9	14.6	6457.5	307.5	81.5	19.5	2.8
Vilanova i la Geltrú	9	283.4	31.5	16.0	2430.0	270.0	97.7	17.9	3.2
Tarragona	9	384.1	42.7	13.4	2628.0	292.0	81.0	19.4	2.9
Cambrils	4	133.1	33.3	5.5	1182.0	295.5	84.3	17.5	2.0
Ametlla de Mar	7	279.8	40.0	10.7	2379.0	339.9	142.4	20.7	1.2
Vinaroz	3	173.0	57.7	22.8	1337.0	445.7	23.8	23.5	1.4
Castellón	14	756.6	54.0	22.9	4740.0	338.6	108.2	23.2	3.1
Burriana	5	309.4	61.9	19.3	1859.0	371.8	96.5	24.5	2.1
Denia	1	20.6	20.6		120.0	120.0		15.5	
Javea	4	127.7	31.9	15.4	870.0	217.5	121.8	19.2	4.8
Altea	2	103.5	51.7	21.0	550.0	275.0	233.3	25.2	1.5
Torrevecija	5	156.2	31.2	18.0	896.0	179.2	57.4	17.9	5.0
San Pedro del Pinatar	1	31.93	31.93		295	295		18.9	
Total	118	4666.6	39.5	18.2	34494.5	292.3	107.1	19.9	3.7

### Set longline targeting demersal species

Target species: *Merluccius merluccius*

Bycatch: *Sparus aurata* (SBG), *Pagellus bogaraveo* (SBR), *Diplodus spp* (SRG)

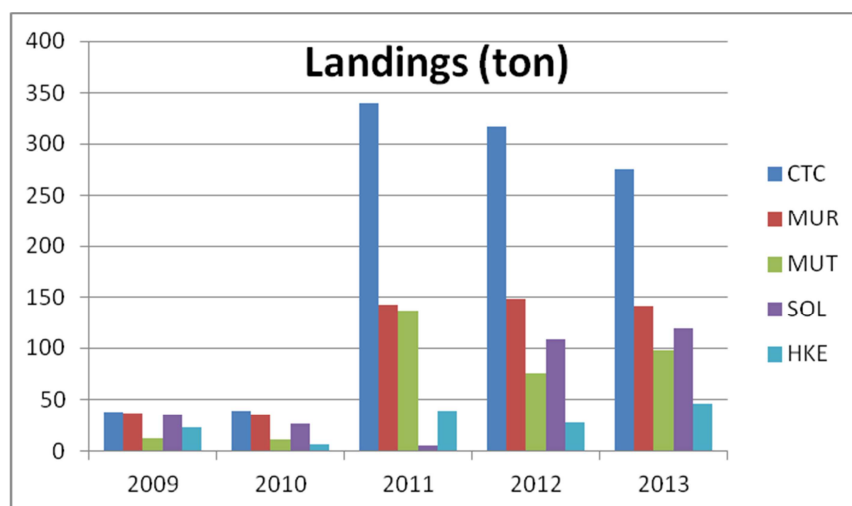


**Figure 1.15.** Landings of the target species in the métier LLS\_DEF. Source of data: Mediterranean data call 2014

### Trammel net targeting demersal species

Target species: *Sepia officinalis* (CTC), *Mullus surmuletus* (MUR), *Solea solea* (SOL)

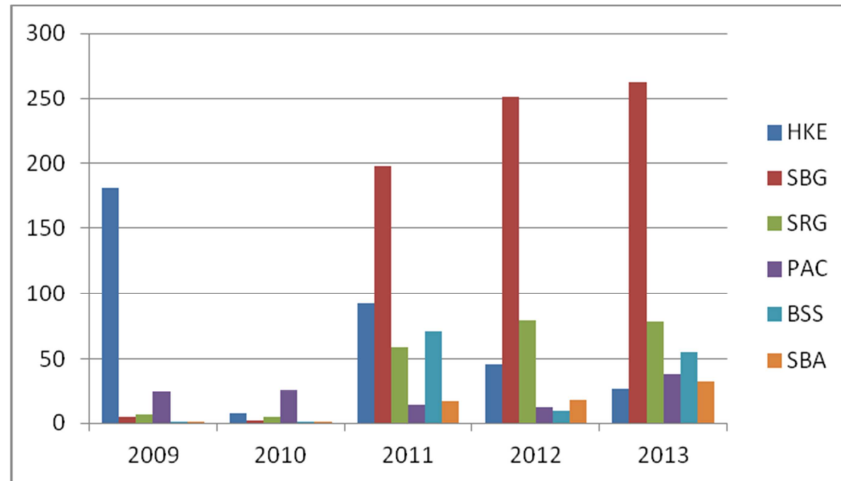
Bycatch: *Mullus barbatus*, *Merluccius merluccius*



**Figure 1.16.** Landings of the target species in the métier GTR\_DEF. Source of data: Mediterranean data call 2014

### Gillnet targeting demersal species

Target species: *Merluccius merluccius*, *Sparus aurata* (SBG), *Diplodus spp* (SRG), *Pagellus erythrinus* (PAC), *Dicentrarchus labrax* (BSS), *Pagellus acarne* (SBA)



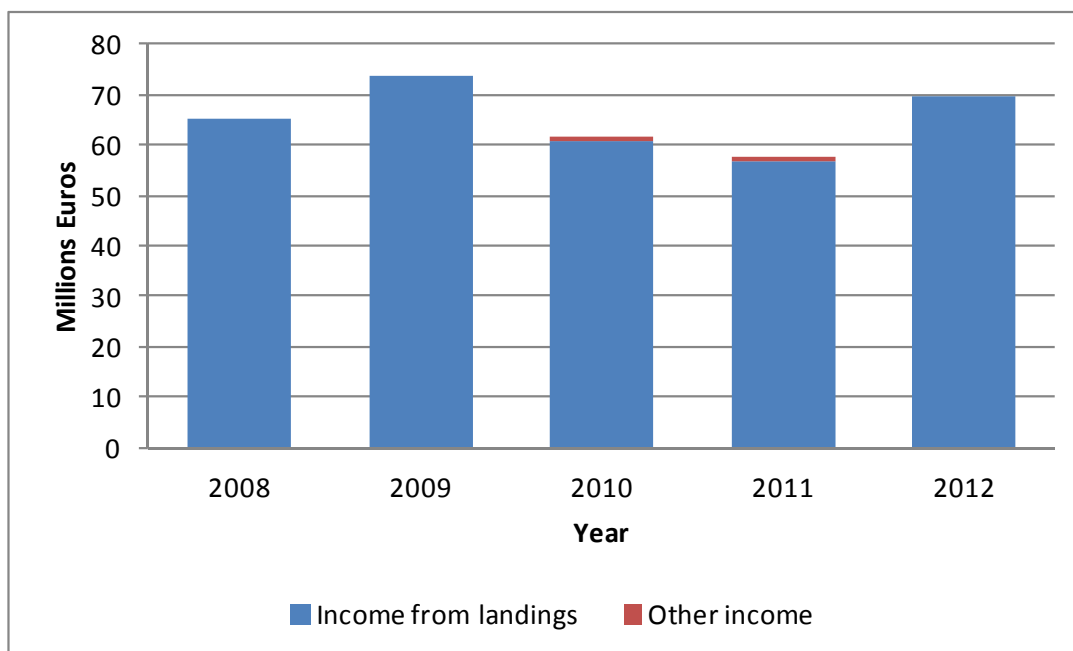
**Figure 1.17.** Landings of the target species in the métier GNS\_DEF. Source of data: Mediterranean data call 2014

## ECONOMIC PERFORMANCE

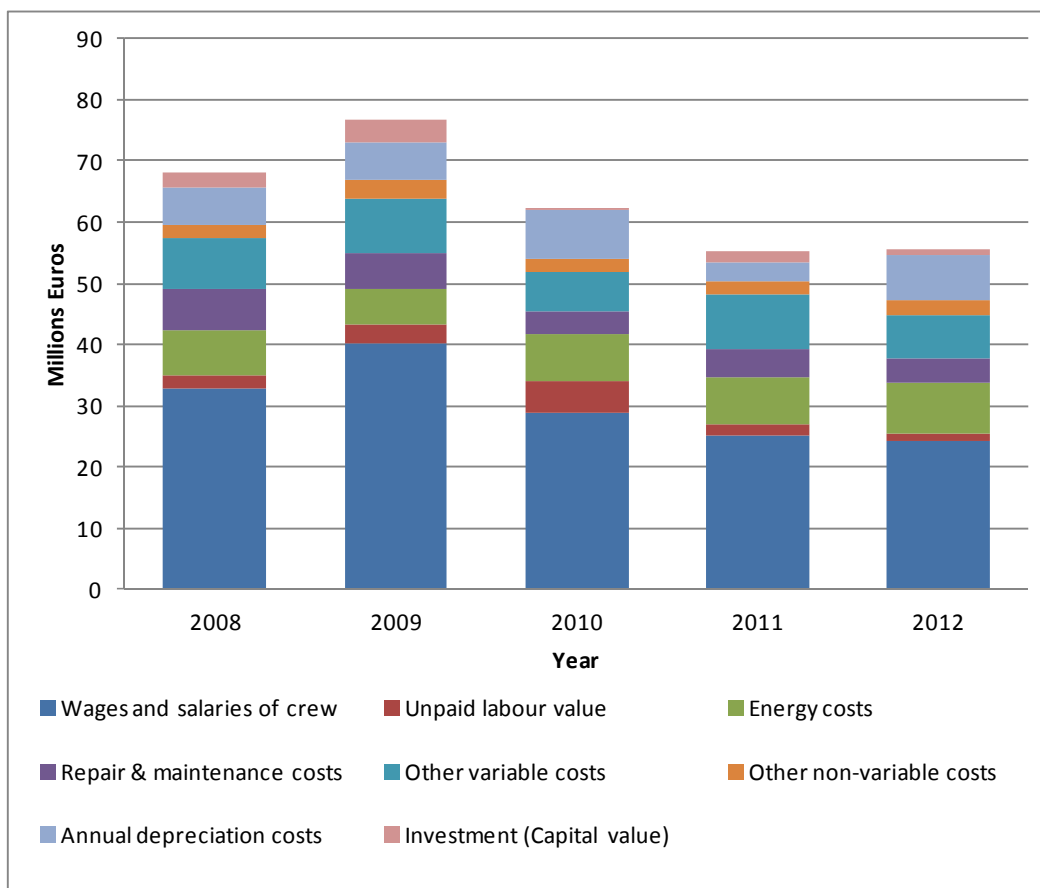
The total weight landed by the Spanish fleet in 2012 was 871 thousand tonnes of seafood, corresponding to €1.9 billion in landed value. There was also an increase in recreational catches, increasing 51% in 2012. The majority of catches (in weight) are from the distant-water fleet, 53% of the total catches, whereas only 9% of the catches are from the Mediterranean Sea (area 37).

In the case of the Mediterranean, the information gathered shows a low level of disaggregation. In fact, the data refer to the total area FAO 37 without dividing the corresponding GSA's (1, 5 and 6). Nor is there a fine division between métiers, although it appears disaggregated between major arts.

The amount of income generated by the Mediterranean Spanish fleet in 2012 was €293.6 million. This consisted of €293.5 million in landings value and €0.1 million in non-fishing income. The Spanish fleet's income decreased 4% between 2011 and 2012, caused by the small scale fleet that suffered a 31% decrease in income. The reduction on small scale fleet's income was a result of a reduction in the number of vessels. On the other hand, purse seine fleet's income increased 20%. Total operating costs incurred by the Mediterranean fleet in 2012 equated to €281.7 million, amounting to 94% of income. Crew and fuel costs were the two major fishing expenses in 2012 representing 30% and 23% of total income respectively.



**Figure 1.18.** Spanish Mediterranean purse seine fleet main economic performance trends for the period 2008-2013.



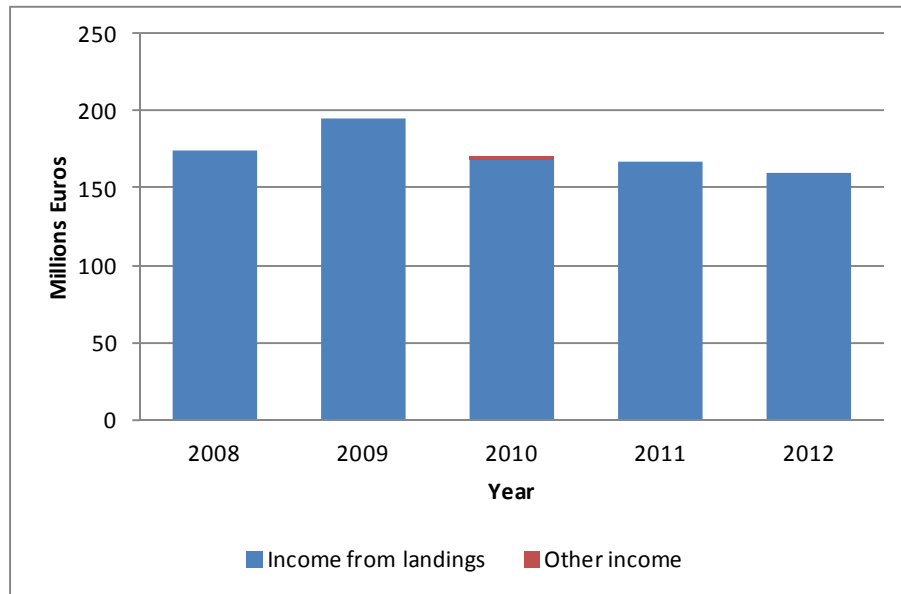
**Figure 1.19.** Spanish Mediterranean purse seine fleet main economic performance trends for the period 2008-2013.

In 2012, according to the official statistics of the Ministry for Agriculture, Food and Environment (<http://www.magrama.gob.es>), the Spanish fishing fleet decreased the number of vessels in order to bring it in balance with the resources. This trend is also reflected in the reduction of engine power and gross tonnage. Between 2011 and 2012, the size of the fleet (measured by vessel tonnage) reduced 5%, which particularly affected the small scale fleet. Profitability of the fleet improved in 2012 motivated by operating cost reductions, but specifically in crew and energy expenses. The number of inactive vessels increased a 39% in 2012, another factor contributing to improved profitability in the sector.

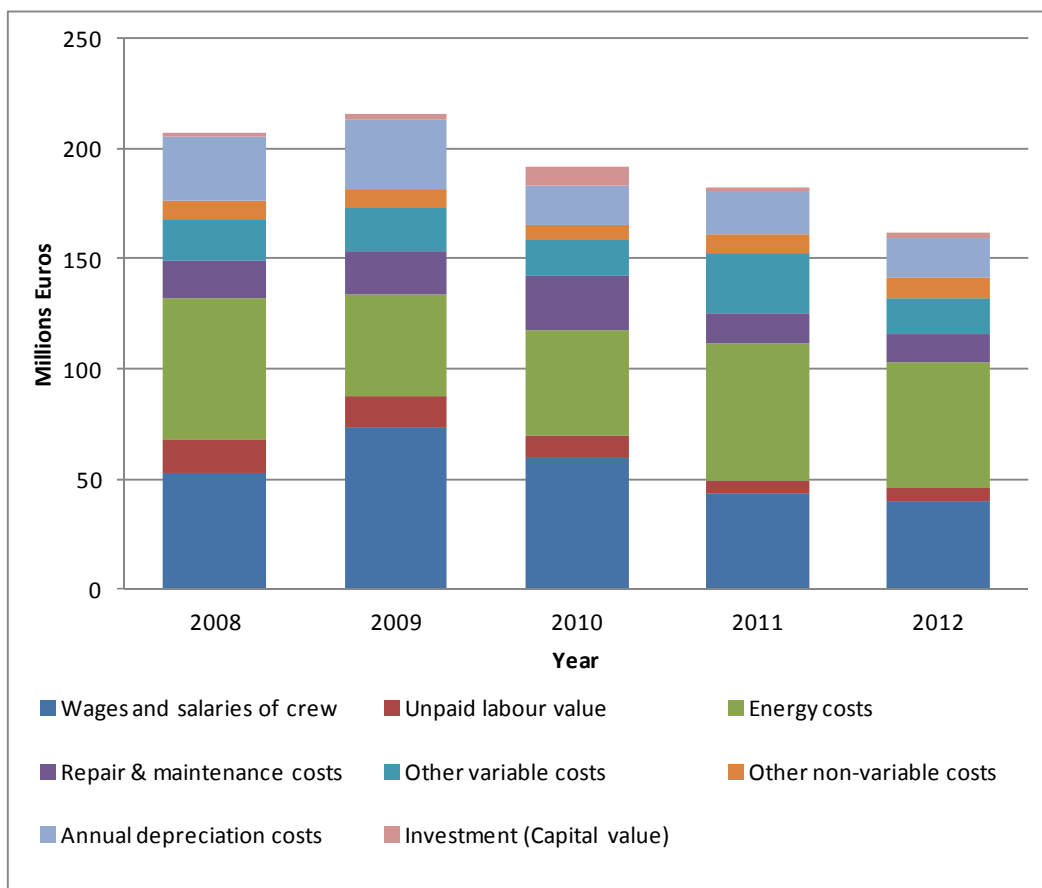
Effort data and landings data was only provided for the years 2012 and 2013 (value of landings provided only for 2012). Data collection for Spain is difficult due the size and complexity (by fishing areas and technology) of the Spanish fishing fleet.

The inter-annual variation in the composition of the small and large-scale fleets is in part due to the methodology used to define each type of fishing technology. Small-scale vessels are defined as vessels less than 12 m using non-towed

gears. If from one year to the next, a vessel with 12 m or less changes its main gear type (used in more than 50% of the fishing effort in a given year) from a passive gear (e.g. HOK - hook) to an active gear (e.g. PS – Purse seine), it will no longer be defined as small-scale but instead as a large-scale vessel.



**Figure 1.20.** Spanish Mediterranean trawl fleet main economic performance trends for the period 2008-2013.



**Figure 1.21.** Spanish Mediterranean trawl fleet main economic performance trends for the period 2008-2013.