



DEEPFISHMAN

**Case Study 3 c
Black scabbardfish in IXa**

Socio-economic study

**Institute of Economic Studies
University of Iceland**

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1 Introduction

Black scabbardfish (*Aphanopus carbo*) is generally considered to belong to a single stock in the northeast Atlantic and a recent preliminary brought strong support to this hypothesis (Longmore et al., 2010). However, for stock assessment and management purposes, two components are considered, the northern and southern. Fisheries in the northern areas (the West of the British Isles) and in the southern area (west of Portugal) are clearly different in technical and socio-economical terms. This case study will deal with the southern component only.

The fishing grounds for black scabbardfish cover three different areas of the Portuguese continental slope (A, B, and C on Figure 1). During the 1980s the main fishing grounds were in area A but in the 1990s the fishing area also included adjacent grounds in area C. Technological improvements in 2000 enabled vessels to explore area B, about 65 nautical miles (nm) north of areas A and C. In order to reduce steam time while exploring area B, the vessels started operating out of Peniche (Bordalo-Machado and Figueiredo, 2009).

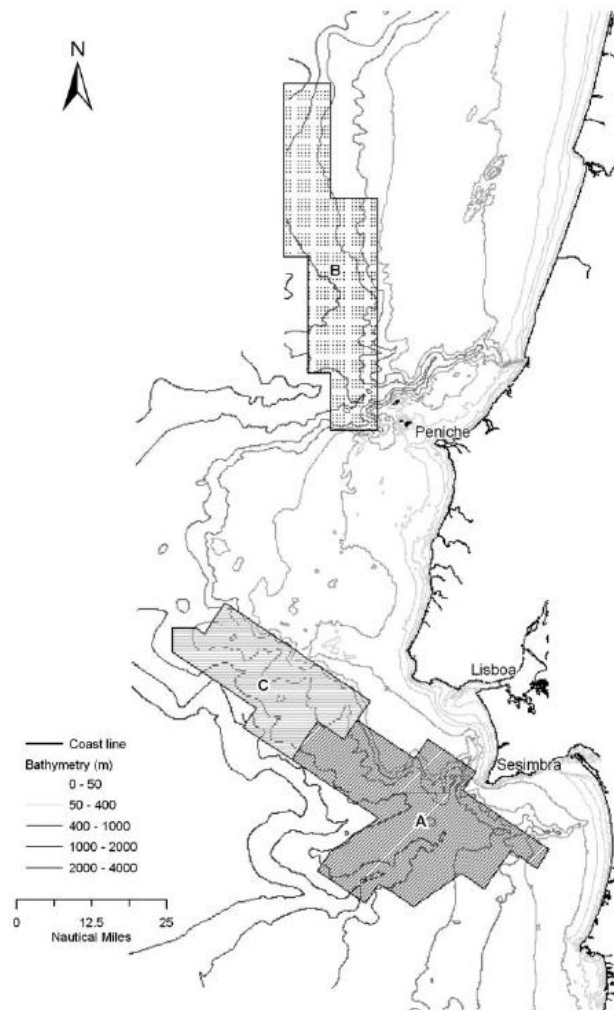


Figure 1 Fishing grounds A, B, and C off the coast of Portugal.
 Source: DEEPFISHMAN Case Study 3 C Report (2010).

2 History of the fishery

The Portuguese black scabbardfish fishery began in 1983 on the continental slopes off the coast within the Portuguese Exclusive Economic Zone. The Portuguese Fisheries Research Institute (IPIMAR) had previously conducted exploratory surveys in collaboration with the harvesting sector. These surveys involved searching for the fishing grounds and conducting preliminary biological studies on the stock, as well as experimenting with longline fishing (Bordalo-Machado and Figueiredo, 2009). Fishermen from the island of Madeira (Portugal) had extensive experience fishing with deep-sea longline gear (Leite, 1988) and took part in developing the fishery.

Most of the black scabbardfish catches in ICES area IX are taken by Portuguese vessels. Total harvests have fluctuated between 2,500 and 4,500 tons in the last 20 years, but have risen somewhat in recent years.

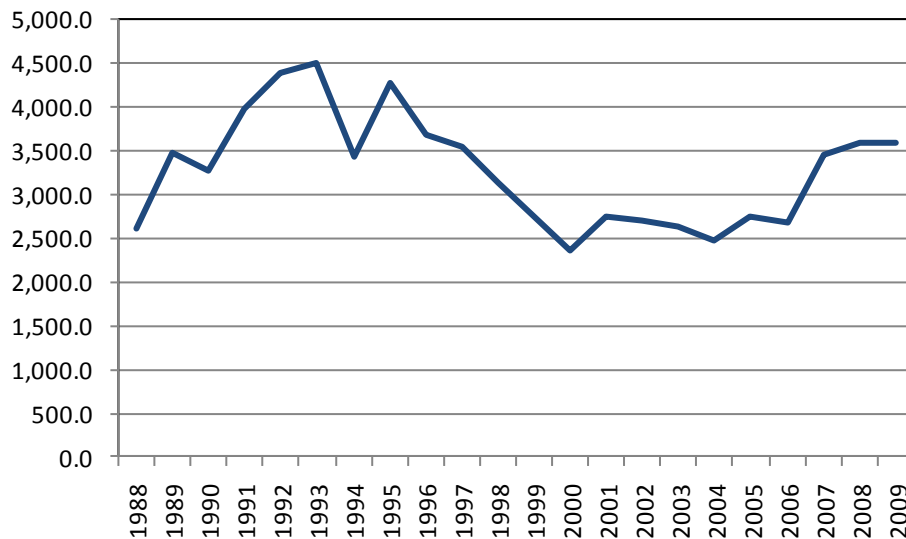


Figure 2 Black scabbardfish catches of the Portuguese fleet in ICES area IX during 1988-2009. Preliminary figures for the last year.
Source: DEEPFISHMAN Case Study 3 C Report (2010).

3 Management

The life cycle of the black scabbardfish is not known with certainty. Nevertheless, the population is understood to carry out an extensive migration throughout the northeast Atlantic and to have a moderate longevity (Bordalo-Machado et al, 2008; Longmore et al., 2010; Pajuelo et al., 2008; Vieira et al., 2009). ICES has conducted research on the black scabbardfish and concluded that there is no clear trend in the stock. However, no information is available before 1996. This scientific advice has been valuable for the European Common Fisheries Policy, responsible for managing the black scabbardfish stock.

Total allowable catches (TACs) for the years 2009 and 2010 were set in December 2008 by the COUNCIL REGULATION (EC) No 1359/2008. The TAC for black scabbardfish in ICES areas VIII, IX and X in the year 2009 is set at 3,600 tons, with Portugal allocated 3,561 tons, and the TAC for the years 2010 the TAC is set at 3,348 tons, with the Portuguese allocation 3,311 tons. The remaining TACs are split between Spain and France.

4 Fleet overview and ownership

When the fishery started, in the early 1980s, the fleet comprised small artisanal vessels which were on average 11 meters long, had a gross registered tonnage (GRT) of 17 tons and an engine power of 100 kW. In the early 1990s, the vessels became larger and more powerful, and in 2002 and 2003 still larger boats entered the fleet. By then the average vessel was 17 meters long, had a GRT of 45 tons and engine power of 310 kW. At present the fleet comprises 17 vessels, most of which have their home port in Sesimbra. The vessels are on average 17.5 meters long, a GRT of 43.3 tons and engine power of 237 kW.

Table 1 Summary statistics of the 17 vessels in the fleet in 2009.
Source: DEEPFISHMAN Case Study 3 C Report (2010).

	Mean	Min	Max	St. dev
Length (M)	17.5	12.8	24.5	3.8
GRT	43.3	-	-	26.5
Engine power (kW)	236.8	106.0	445.0	114.6

The distance from the homeports to the fishing grounds is about 105 km (or 57 nm). The main landing port is Sesimbra which is about 31 km, (17 nm), from the main fishing grounds. The fishermen in the fleet usually explore the same area all year round as well as the same fishing grounds within each area. Hence, fishermen do not compete for locations or directly for resources (Bordalo-Machado and Figueiredo, 2009).

Although investments have been made in fishing vessels, the gear used has not changed much since 1984. The vessels use a horizontal bottom longline as their main fishing gear with alternating floats and weights at constant intervals along the main line. The number of hooks used on the fishing gear has increased from about 4,000 at the beginning of the fisheries to about 4,000-10,000 in 2004. Automatic line devices have not been introduced and little changes have been made to the fishing operations as such. (Bordalo-Machado and Figueiredo, 2009)

Fishing trips usually last 2-3 days, with vessels usually departing at dusk and steaming for 1-6 hours. Once they have reached the fishing grounds the fishermen deploy the prepared baited longline gear into the sea and mechanically haul in the longline gear set in the previous 24-48 hours (Bordalo-Machado and Figueiredo, 2009). Deploying the baited longline usually takes about 2 hours while hauling the previous longline takes about 8-15 hours (Bordalo-Machado et al, 2008).

The skippers of the vessels are usually also the owners. Extensive experience has been built up within the fishery as the majority of the vessels have been taking part in the fishery for more than 10 years with the same skippers. This experience has enabled the fleet to reduce preparation time and also gain a better understanding of the fishing grounds (Bordalo-Machado and Figueiredo, 2009).

The fishing gear is prepared on land which is quite labour intensive. By hand the gear must be disentangled, baited, and prepared into tubs for the operations at sea all. This labour intensive process of preparing the gear restricts the fleet to no more than three hauls a week (Bordalo-Machado and Figueiredo, 2009).

5 Labour

Those individuals taking part in the fishery can broadly speaking be divided into three categories; crew, land-based employees and processing works. The crews are responsible for all the operations at sea and sometimes the preparation of fishing gear, but preparing the longline is otherwise in the hands of land-based employees. There is one processing firm in Sesimbra for catches of black scabbardfish, where the catch is processed and packaged.

Table 2 Composition of workers in the black scabbardfish sector in 2009.
Source: DEEPFISHMAN Case Study 3 C Report (2010).

	Crew	Land-based	Processing		Total
			Males	Females	
Employees	121.0	112.0	25.0	16.0	274.0
Average age	48.0	51.0		42.0	
Average work experience	13.0	12.0		9.0	
Average experience in fisheries	32.0	51.0		9.0	

In 2009, there were 274 individuals employed by the fishery. The 17 vessels engaged in the fishery had a combined crew of 121, while further 112 employees were land-based. The crew of a typical vessel thus numbered seven, but the largest vessels had a crew of up to 10. The processing plant employed 25 men and 16 women. The overall share of women in the black scabbardfish workforce thus amounts to 6%.

Table 3 shows the composition of sea and land crew for 15 out of the 17 total vessels in the fleet. All of the workers presented in table 3 are men. Land crews tend to be as large as the sea crews because it is possible for some of the sea crew to prepare the fishing gear and hence reduce need for land staff (Bordalo-Machado and Figueiredo, 2009). The average number of workers per vessel is 16, half work at sea and the other half on land. The number of workers varies greatly among the vessels, one vessel only has six staff working at sea, the majority of vessels have between 15-20 staff working at sea and on land.

Table 3 Number of workers for 15 out of the 17 vessels in the fleet in 2009.
Source: DEEPFISHMAN Case Study 3 C Report (2010).

Vessel	Crew	Land-based	Total
1	7	9	16
2	8	7	15
3	8	6	14
4	8	9	17
5	8	10	18
6	9	6	15
7	6	0	6
8	9	6	15
9	9	11	20
10	10	9	19
11	7	6	13
12	8	10	18
13	6	9	15
14	7	8	15
15	8	9	17
Total	118	115	233
Average	7.9	7.7	

Wages are based on a share system, with approximately 40% of the sale of black scabbardfish shared amongst the crew.

As stated before, there were 274 individuals directly engaged in the fishery, but that does not take into account the number of dependencies. As revealed in Table 4, most of those directly involved in the fishery were married and had children and even grandchildren. All in all it is estimated that around 1,100 individuals depended to a large extent on the fishery for their livelihood. As Sesimbra had a total population of close to 38,000 in 2009, the black scabbard

fishery can be estimated to have been the mainstay of around 2.6% of the population. These figures do not take into account the number of individuals indirectly linked to the fishery.

Table 4 Overview of workers and family dependent on the black scabbardfish sector in 2009.
Source: DEEPFISHMAN Case Study 3 C Report (2010).

	Processing	Crew	Land-based	Total
Workers	41	121	112	274
Wives and husbands	25	99	90	214
Children	58	279	278	615
Total	124	499	480	1,103

6 Processing and markets

Catches are landed fresh and gutted. In recent years, the majority catches are bought by a single buyer, *ArtisanalPesca*, the local association of producers and ship owners, which is responsible for the processing and commercialization of the fish. The price of fish is set according to a pre-established contract between the buyer and fishermen. During the last decade black scabbardfish has developed into one of the main commercial deep-water species caught in Europe. The black scabbardfish caught and processed in Portugal is regarded as a higher quality fish than landings by French and Spanish trawlers because the fish is landed whole with the skin still on. French and Spanish vessels use trawls and this fishing method rips the skin of the fish. In addition, these vessels freeze their catches aboard.

Black scabbard fish is sold as fresh whole fish, fresh and frozen fillets, and frozen fish steaks. The fish is mainly sold within the national market, approximately 60-70% is sold to large distribution chain stores and about 10% to the local market. Moreover, about 10-15% of the fish is sold to the frozen products market.

In Portugal mainland Sesimbra is the main landing port. In the years 2006-2008, landings at Sesimbra amounted to half of total landings in Portugal.

Table 5 Total landings and value for both Sesimbra and Portugal, 2006-2008.
Source: DEEPFISHMAN Case Study 3 C Report (2010).

	2006		2007		2008	
Area	Sesimbra	Portugal	Sesimbra	Portugal	Sesimbra	Portugal
Volume (tons)	2656	5446	3421	6378	3591	6710
Value (€ '000)	7056	13755	10003	17803	10612	18021

Landings in Sesimbra and average prices received in the years 2006-2008 (€ per kg) are shown in Figure 3. Prices have fluctuated between €2.0-3.0, and do not appear to have been too greatly affected by variations in landings.

The monthly price (right axis) of the black scabbardfish is shown in figure 3 as well as total landings (left axis). The price of the fish has mainly fluctuated in price range of 2.5-3.0 €/kg.

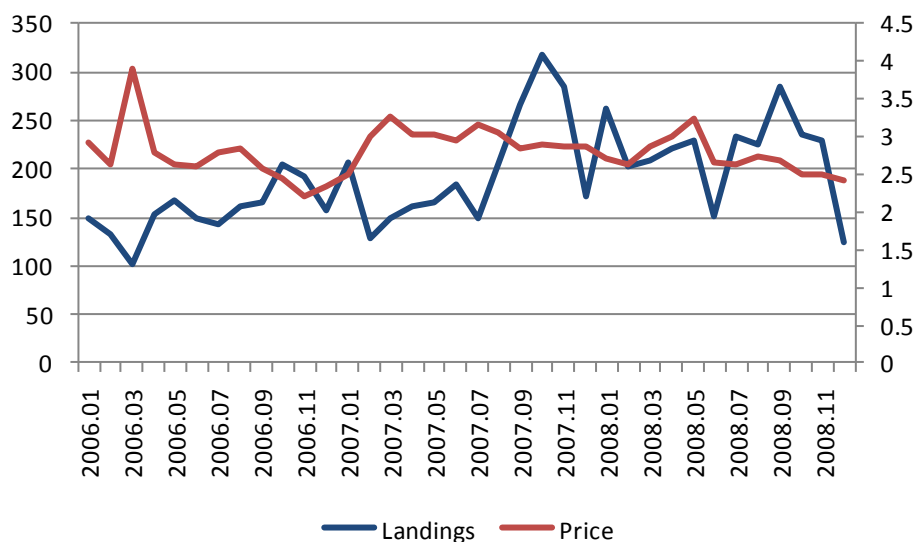


Figure 3 Total landings in tons (left axis) and average price in € per kg (right axis).
Source: DEEPFISHMAN Case Study 3 C Report (2010).

7 Financial performance

During the period 2006-2008, the black scabbard fishery was always operated with a profit. Both costs and revenues increased by 150% from the previous year in 2007 and 2008.

Table 6 presents revenues, costs, and profits for the years 2006-2008 for ArtesanalPesca, the local association of producers and ship owners.

Table 6 Financial performance of ArtesanalPesca, 2006-2008.
Source: DEEPFISHMAN Case Study 3 C Report (2010).

	Revenue	Costs	Profits
2006	1,669	1,394	274
2007	4,308	4,254	54
2008	10,985	9,612	1,372

Some vessels have applied for subsidies from the European Union in order to modernize their vessels. These subsidies are intended for the purchase of technical equipment such as radios and also for plastic materials in which to increase the storage quality of fish.

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