

PORTUGUESE FISHERIES IN PORTUGAL FOR THE PERIOD 1950- 1999. COMPARISON WITH ICES DATA

Louize Hill and Maria Lucilia Coelho¹

DRM, IPIMAR, Portuguese Fisheries and Sea
Research Institute, Avenida de Brasilia, 1449-006,
Lisboa, Portugal, E-mail: lhill@ipimar.pt

¹ Present address: Universidade de Algarve, Campos
de Gambelas, UCTRA, PT-8000 Faro, Portugal.

ABSTRACT

The Portuguese fishery in Portugal waters landed its greatest catches in the mid 1960s, and landings have remained lower but steady since then. Purse seines, targeting sardines (*Sardina pilchardus*), had the highest catches of all fisheries from 1950-1999. Fish and cephalopod trawls, crustacean trawls, and multi-gear vessels form the remaining fleets. During the 1990s, both the catch and value of most target species decreased slightly (except for octopus), due to decreasing fleet sizes in all fisheries. Official Portuguese catch statistics are compatible with ICES landing figures since the late 1980s. Prior to this period, Portuguese catch statistics are approximately 18% lower. We assume Portuguese discard rates are low. The Portuguese fishery is dominated by purse seines, which generally have low discard rates. This contrasts with Spanish fishery, which has a greater trawling fleet and is thus more likely to produce higher discard rates. Surprisingly, the biomass of shark discards in Portuguese fishery is probably quite high, as they form a substantial proportion of the trawling fisheries catches, and are nearly always discarded.

DESCRIPTION OF THE PORTUGAL FISHERIES

Fishing is a traditional, culturally important activity in Portugal, and is dominated by small, local fishing vessels. Over the past decade the number of vessels has decreased, but this has been compensated by an increase in power per vessel. In 1996, 98% of the fishing fleet was motorized - a 2% increase since 1986. Fishing vessels operate out of 32 ports in Portugal, distributed along the coast. The largest port is Aveiro, where 975 vessels are registered (Anon., 1998). Portuguese fisheries management is based on the European Union system, which includes TACs and quotas for some species, fishing area or

gear restrictions, minimum size requirements for captures, standard mesh sizes, and maximum percentages of incidental catches.

According to the 1991 population census, 20,114 people are employed in the fisheries sector; this represents less than 1% of the total employable population above age 12 (Anon., 1998). Of these workers, 97% are male, often having a low level of education, with 9% being illiterate, and 68% having only primary school education (Anon., 1998). Younger workers, however, tend to have a higher education level.

The most important Portuguese fisheries, in terms of landings and value, are listed in Table 1. Unless indicated otherwise, the information presented in this report is based on Anon. (1994, 1997, 2000a, b, 2001) and Parente (2000). In 1996, the total landing for the Portuguese fleet was 164,103 tonnes, of which 58% were caught by purse seines, 13% by trawls and 29% by multigear fleets. The purse seine fishery targets mainly sardines (*Sardina pilchardus*), but also captures Atlantic horse mackerel (*Trachurus trachurus*), chub mackerel (*Scomber japonicus*) and Atlantic mackerel (*Scomber scombrus*) in smaller quantities. Sardine is the most important species in terms of total landings in Portugal, and are much higher than those of Atlantic horse mackerel, with the second highest landings (Figure 1). During the period 1986 – 1996 sardine accounted for an average of 40% of total landings of all species in tonnage, but only 11% of the total value of all landings. Over the past decade the quantity of sardines landed has decreased by 16%, and this was associated with the decrease in the number of vessels and the corresponding 23% decrease in total capture by the purse seine fishery. However, attempts to bring the sardine price in line with that from other European countries since Portugal joined the EU has resulted in an increase in value.

There are two distinct trawl fisheries in Portugal. One targets fish and cephalopods, and the other crustaceans. Over the past decade the total fish landings by trawlers have decreased by 40%. This decrease may have been due to a reduction in the number of trawlers, or due to reduced catches. The main species caught by the trawl fishery targeting fish are Atlantic horse mackerel (35% of landings in 1996), Blue whiting (*Micromesistius poutassou*; 15%), octopus (10%) and European hake (*Merluccius merluccius*; 3%). Landings and value of both Atlantic horse mackerel and European hake have decreased by about 50%

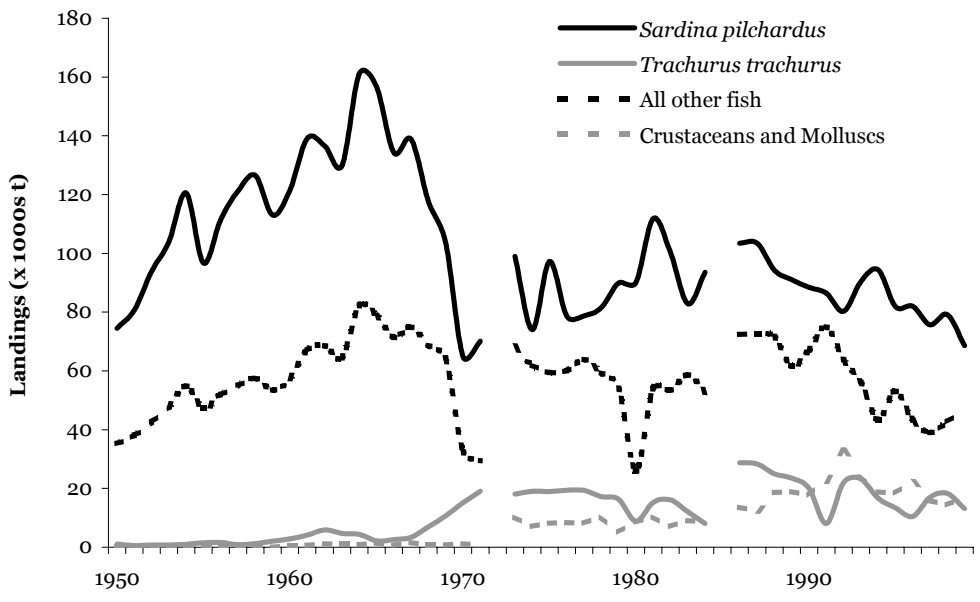


Figure 1. Landings by species or group of the Portuguese fisheries in ICES Area IXa, 1950-1999.

between 1986 and 1996. Conversely, octopus has shown a marked increase, both in terms of landings and value. Over the past decade there has been a 186% increase in landings and 100% price increase, thereby nearly quadrupling its value (Monteiro and Monteiro, 1997).

Although the trawl fleet that targets crustaceans is small, with only 30 registered vessels (reduced from 36 in 1995), it is a lucrative fishery. The main species captured are red shrimp (*Aristeus antennatus*) and deepwater rose shrimp (*Parapenaeus longirostris*). Crustaceans are considerably more expensive than other fisheries products. Therefore, although the quantity landed represents less than 1% of total landings, they account for almost 4% of the total value of landings (Cadima *et al.*, 1995).

The multigear fleet is made up of boats that are licensed to use several different gear types throughout the year. These boats operate in both coastal waters (smaller boats less than 9 m in length) and further offshore. The main gears used are gillnets, trammel-nets and longlines. The most important species in terms

of weight caught by the artisanal fishery is octopus. This species is caught by pots and traps and represents 11% of all captures. European hake only represents 5% of the weight landed, but is the most important in terms of value (11%). Nevertheless, the gillnet fishery is considerably less important than the trawl fishery; in 1999 it only represented 4% of all hake caught. It is, however, more selective than trawls and only catches a small size range of fish. The number of vessels in this fishery has also decreased over the past decade.

Table 1. Major Portuguese fisheries.

Target Species	Scientific name	Gear type
European pilchard / Sardine	<i>Sardina pilchardus</i>	Purse seine
Atlantic horse mackerel	<i>Trachurus trachurus</i>	Bottom trawl
Atlantic horse mackerel	<i>Trachurus trachurus</i>	Purse seine
European hake	<i>Merluccius merluccius</i>	Gillnet
European hake	<i>Merluccius merluccius</i>	Bottom trawl
Crustaceans	-	Bottom trawl
Octopus	<i>Octopus vulgaris</i>	Pots and traps
Octopus	<i>Octopus vulgaris</i>	Bottom trawl

CATCHES IN ICES AREA IXA BY PORTUGUESE FLEETS

Figure 2 shows the total Portuguese landings by fleet from 1950 to 1999 (data for 1972 and 1985 are lacking). Purse seines account for the greatest total landings of any gear type. Their landings decreased considerably in the late 1960s, and have increased somewhat during the 1970s and 1980s. Artisanal gears appeared in the data set in the mid 1970s. Records continue until 1984, after which they were recorded under multigear fleets. Trawler landings are relatively low and reached a maximum during the early 1970s.

COMPARISON WITH ICES DATA

Before the 1990s, the total landing estimates from official Portuguese data were on average 18.7% below the ICES landings estimates for the same area, with the greatest difference in the early 1970s (Figure 3). The ICES data do not show the substantial decrease in total landings in the late 1960s like the Portuguese data do. After 1990, the two data sources were more similar.

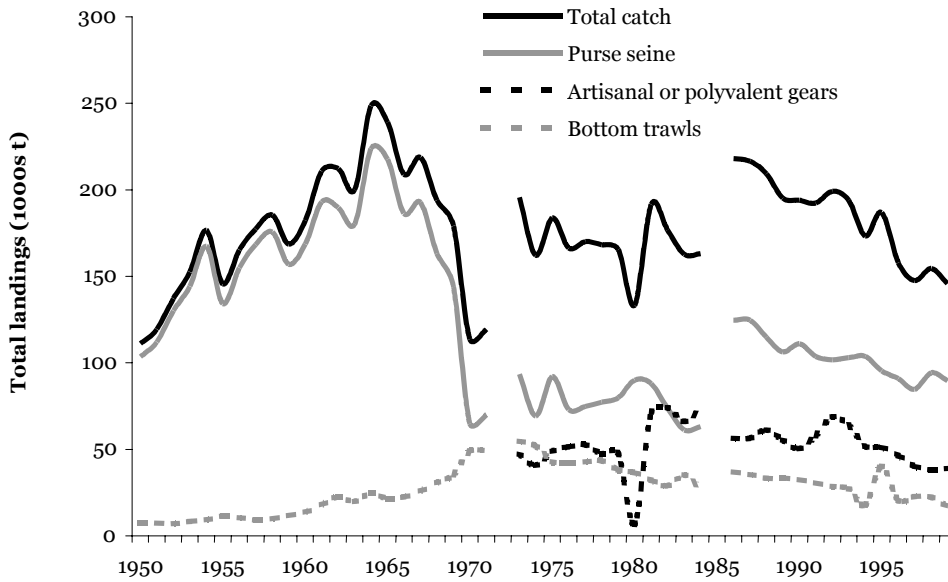


Figure 2. Total landings by fleet of the Portuguese fisheries in ICES Area IXa, 1950-1999.

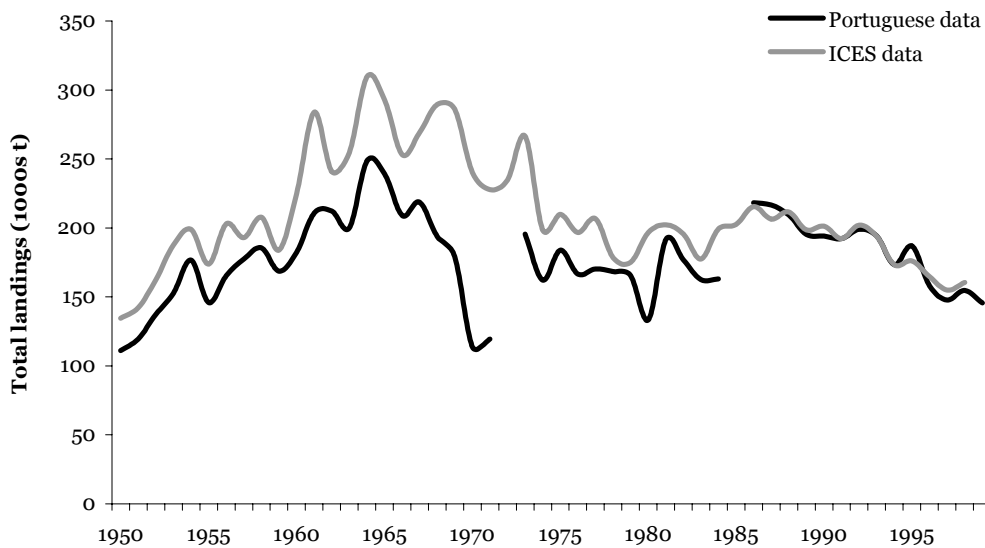


Figure 3. Comparison of total landings of Portuguese fleets between official Portuguese data and ICES data in Area IXa, 1950-1999.

DISCARDS

Except for the last few years, no discard data are available. However, these recent estimates seem suspect (there are some negative values) and are not species specific. Moreover, for some of the small scale fisheries, we do not even know what species are caught, let alone the quantities of each. Work is in progress to fill these gaps. However, we assume that discards in Portugal are relatively low, because the fisheries are mixed, targeting various species, and most fish are valuable, so will be landed.

For example, the semi-pelagic longline fishery in southern Portugal operates in deeper waters, targeting larger individuals of hake that are of high commercial value and never discarded (Erzini *et al.*, 1998). Conversely, discard levels of hake from Portuguese trawlers are likely higher, if they are similar to discard rates in Spanish trawlers: in 1994, when 42% of Spain's hake landings in Areas VIIIc and IXa were landed by trawlers, the hake discard rate was 7% of the total trawler landings by weight (Anon., 1999). In 1997, when trawlers landed 60% of Spanish hake landings, the hake discard rate from trawlers was estimated at 27% (Anon., 1999). The proportion of Portuguese hake landings by trawlers in the same area and the same years, however, was lower than those of Spain (26% of hake landings in 1994 and 38% in 1997; Anon., 1999). Thus, although the discard rates of hake by Portuguese trawlers are likely similar to the hake discard rates of Spanish trawlers, we might expect the hake discard rate of the entire Portuguese fishery to be lower than that of Spain, as a smaller proportion of hake are landed by trawlers.

In a study off the Southern Portuguese coast from May 1996 – June 1997, shark discards constituted 15.5% of the total catch by weight of all species caught in crustacean trawls or fish trawls (Costa and Borges, 1998). The most frequently discarded species was *Scyliorhinus canicula* (Scyliorhinidae) (5.1% of total catch by weight), which is occasionally included in commercial captures, as a limited market exists for it (Costa and Borges, 1998). All other shark species caught are always discarded due to their low commercial value, so that their proportion of capture equals their proportion discarded. These included *Galeus melastomus* (Scyliorhinidae, 3.6% of the total catch by weight of all species), *Hexanchus griseus* (Hexanchidae, 3.3%), *Etmopterus spinax* (Squalidae, 2.4%), *Etmopterus pusillus*

(Squalidae, 0.8%) and *Dalatias licha* (Squalidae, 0.3%) (Costa and Borges, 1998).

Sharks were caught from late winter through late summer during the study (Costa and Borges, 1998). No sharks were caught by purse seines or trammel nets during the study. The longline fishery, fishing further off the coast of Southern Portugal, catches large *G. melastomus* individuals, and these are of some commercial value (Erzini *et al.*, 1998). As shark discards represent a considerable proportion of the total catch in weight, they are potentially valuable commercial species and could be important as a by-catch if a market were developed for them (Costa and Borges, 1998).

REFERENCES

- Anon. 1994. EC Report of the Southern hake task force. Lisbon, Portugal, 10-14 October 1994. 34 pp.
- Anon. 1997. Review of the state of world fishery resources: marine fisheries. 2. Northeast Atlantic. FAO Fisheries Circular N^o.920 FIRM/C920. 6 pp.
- Anon. 1998. Pescas em Portugal 1986–1996. Instituto Nacional de Estatística (INE), Direcção Geral das Pescas e Aquacultura, Lisboa. 280 pp.
- Anon. 1999. Working group on the assessment of southern shelf demersal stocks. ICES CM 1999/ACFM:4, Part 3/3. 696 pp.
- Anon. 2000a. Economic performance of selected European fishing fleets. Annual report 2000. Promotion of common methods for economic assessment of EU fisheries. Concerted action (FAIR PL97-3541). Doc. N^o. 14. 212 pp.
- Anon. 2000b. Report from the working group on the assessment of mackerel, horse mackerel, sardine and anchovy. ICES CM 2000/ACFM:5. 546 pp.
- Anon. 2001. Report of the working group on the assessment of Southern shelf demersal stocks. ICES CM 2001/ACFM:05. 786 pp.
- Cadima E., Figueiredo M. and Beddington J. 1995. Bioeconomic evaluation of the crustacean fishery of south of Portugal. FAR Contract N^o MA-3-738. 119 pp.
- Costa, M.E. and Borges, T.C. 1998. Shark discards from the Southern Portuguese coastal fisheries. ICES CM 1998/BB:15 Fisheries Assessment Methods. 20 pp.
- Erzini, K., Goncalves, J.M.S., Bentes, L., Lino, P.G. and Ribeiro, J. 1998. The hake semi-pelagic ('pedra-boia') longline fishery in Algarve (southern Portugal) waters: catch composition, catch rates, discards, hook selectivity, and inter-annual variability. ICES CM 1998/O:2 Theme Session (O) on Deepwater Fish and Fisheries. 12 pp.
- Monteiro, E. and Monteiro, C. C. 1997. A gestão das pescarias em Portugal: problemas e perspectivas. p 73-85. I Encontro Internacional de Vilamoura sobre Pescas. 3-4 Nov. 1997, Vilamoura, Portugal. Editor C.C. Monteiro. 147 pp.
- Parente, J. 2000. Frota costeira de cerco. Análise das dimensões e de alguns parâmetros de exploração, numa perspectiva global e regional. Relat. Cient. Tec. Inst. Invest. Pescas Mar. N^o 50, 49 pp.