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## **Current situation of the Deep Water Fisheries exploited by Spanish fleets in the North and Northeast Atlantic: A review.**

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### **ABSTRACT**

Most of the deep-water fisheries exploited by the Spanish fleet may be considered as a by-catch in mixed fisheries. They are related to different sea areas Sub-Areas VI, VII, XII, Divisions VIIa,b; VIIc (Cantabrian Sea) and IXa (NW of Spain), using different gears (trawl, long-liner, gillnet). In recent years, new fisheries targeting deep-water species have been established as a result of the over-exploited state of the traditional stocks. These fisheries are mainly opportunistic and are subject to a great variability relying on the abundance, economic importance, season, and yields in relation to target species depletion. This review describes the deep fisheries of the North and Northeast Atlantic exploited by the Spanish fleet, gears, seasonal activity and their target species, as well as landings, by ports, of the most important species. In addition, traditional artisanal fisheries off the Cantabrian Sea coast and the South Atlantic region of Spain targeting certain species are also described.

Key words: Deep fisheries, Description, North Atlantic, Spain.

### **INTRODUCTION**

Until the 80's, the deep-sea species, according to their bathymetric distribution, were beyond the range of the traditional fishing methods. Vessels ventured into new fishing areas down to 1000 m, risking the loss of fishing gear and subsequent economic losses. Also, the appearance and state of the species caught made their introduction into the market difficult without prior processing or a reorientation towards other types of consumables, as in the case liver oils from shark. This meant that, as a general rule the fishing industry had to adopt a different technical, economic and legal approach to overcome these difficulties.

For these and other reasons, until recently, the deep-water fisheries in the North Atlantic have not been taken into consideration in Spain excluding some traditional and very local fisheries. However, the scarcity of other traditional resources or rather the licensing restrictions on fish species the TACs & Quotas system, have given rise to the search for new fisheries resources. This search has been basically two-fold: to profit better from the by-catches and to look for new fisheries, among others, in deeper waters.

Since 1990, Spanish commercial fleet fishes for deep-water species on both sides of the North Atlantic Ocean. In the Northwest Atlantic, the most important fishery is Greenland halibut (*Reinhardtius Hippoglossoides*) in terms of both economy and catches (Hopper A.G., 1995). Other teleosts and deep-water sharks are the main species caught in the Northeast Atlantic. This paper only describes these fisheries.

In the Northeast Atlantic, most of the deep-water fisheries must be considered as by-catches in mixed fisheries. They are related to different sea areas, Sub-Areas VI-VII, XII, Divisions VIIa,b, d, VIIc (Cantabrian Sea) and IXa (NW of Spain) (Figure 1), and different gears (trawl, long-liners, gillnets). Only in recent years have directed deep-water fisheries been established, more in an experimental way and/or restricted to a part of the year, when licences or yields in relation to target species are depleting. Due to the various peculiarities of these fisheries and to the relatively small importance of most of the species involved in comparison to the target species, the information is available for few fleets and species. In addition, traditional artisanal fisheries have been relatively important along the Cantabrian Sea coast and South Atlantic region of Spain, focusing on certain species.

In general, the deep-fisheries of the North and Northwest of Spain present high variability of the target species throughout the year. Also the target species are substituted by others according to the abundance, market price and catch in the seasonal and traditional fisheries. This hinders an accurate knowledge of the situation at any given moment (ICES, 1996, 1997).

This paper summarises the current status of knowledge on deep-water fisheries exploited by the Spanish fleet. Due to the peculiarities of these fisheries and the variety of data sources, the information provided here has to be considered mostly as an estimate of the real data.

## MATERIAL AND METHODS

The information presented here was obtained under the framework of the EC Fair Project entitled "Developing deep-water fisheries: data for their assessment and for understanding their interaction with and impact on a fragile environment related to deep-water species (CT 95/655).

The fishing activity of the Spanish fleet involved has been monitored by observers on board commercial vessels and visits to the most important harbours along the coast. The observers provided information on fishing areas, types of gear used, catches and fishing effort and biological information from the sampling program carried out over a period of a year and a half.

Periodical visits to the harbours and interviews with fishermen and vessel owners were conducted to know the changes that fleet suffer, (termination of activity due to lack of license, breakdown), as well as in their activity (beginning and end of the seasonal and traditional fisheries, etc.).

## RESULTS

The description of these fisheries is relatively difficult because of the variety of concerns, their opportunistic character, groups of species involved, boats, geographical areas, and catches landed in local markets, which are not easily accessible.

### *a) By-catch of deep-water species in mixed fisheries*

In Sub-areas VI-VII, Divisions VIIIab and Division VIIIc Spanish trawlers long-liners and gillnets fish deep-waters species mainly in the Celtic Sea, Porcupine Bank, Rockall Bank, Bay of Biscay and Cantabrian Sea, when fishing for hake, megrim, anglerfish and nephrops. A variable proportion of these deep-waters catches is discarded or landed as by-catch, depending on the price of the species on the market, the facilities processing them on board and the duration of the trips. In some ports, landings of similar species are usually sold all together depending on the local appreciation of the fish in the market. Because of this, it is difficult at present to have reliable information on exact landings by species.

Belonging to this by-catch, there are a group of species, which are traditionally more appreciated in the fish market: *Phycis spp.*, *Pagellus spp.*, *Molva spp.* For this reason, it is possible to present reliable data for this group of species (Table 1).

The main species from by-catches landed from these fisheries are: *Conger conger*; *Helicolenus dactylopterus*; *Hoplostethus mediterraneus*; *Polyprion americanus*; *Epigonus telescopus*; *Brosme brosme*.

### *b) Directed Fisheries on Deep-water species*

In 1991, a new fishery targeting deep-water species started in ICES Sub-areas VI-VII. Their main target species were deep-water sharks, but also some catches of *Phycis phycis*, *Molva dipterygia*, *Molva molva*, *Helicolenus dactylopterus*, *Beryx spp.* were obtained. The fleet comprised long-liners which had traditionally caught hake in these areas, but taking into account the problems in maintaining profitability and with the advent of the market for the livers of these sharks for the production of oils, the vessels began to fish for sharks in waters of depths greater than 1,000 metres (Iglesias, S. and Paz, J., 1995).

In Galicia (Northwestern Spain) the landings are mainly in the port of A Coruña. Almost all of the vessels involved operate under a foreign flag. The total landings and number of boats and fishing trips for this fishery, for the period 1991-1994 are shown in Table 2. Since 1995, the situation has changed and the Spanish long-liners focusing on the deep sea sharks, have left this fishery and they turned to the traditional fishery of hake. The reason for this may have been the fall in price of shark liver in recent years.

Since 1996, two long liners are devoted to fishing deep sharks in Divisions VIIIc, VIIIabd, and IXa, throughout the year. These long-liners are based at Fisterra and Avilés harbours, the other longliners are catching deep-sharks seasonally (mainly from October to March) and the important harbour is San Vicente de la Barquera.

These long-liners which have traditionally focused on hake, have modified their gear to shark fishing in waters about 900-1300 m in depth. The gear consists of a modified long-line (10 hooks per tipping), with a total of between 3000-4000 (Figure 2).

The sharks captured are a mixture of the species: *Deania calceus*, *Centrophorus squamosus*, *Centroscymnus coelolepis*, *Dalatias licha* and others. Their livers (one quarter to one fifth of the total body weight) are the major commercial item giving rise to their capture. The liver is retained to extract oil, the fins and the body are sold to the human consumer, and the skin, depending on the species, is used for leather purposes. The quantity of all deep-water sharks landed (skinned and gutted) for the period 1991-1997, in small ports of the North and North West of Spain, is shown in Table 3.

The discards are generally very small. The main species discarded are rays and grenadiers. Bycatch is also small and consists of Greater forkbeard (*Phycis blennoides*), (*Molva spp.*) and Black scabbard fish (*Aphanopus carbo*).

There is another deep-water longline fishery off the coast of northern Spain (ICES Division VIIIc). The target species change from an area to another so the long liners from Cantabrian Sea ports are mainly targeted on Greater forkbeard. However, in the ports in north-western Spain, the target species is variable (*Beryx splendens*, *P. blennoides*, *Pagellus bogaraveo*), depending on the market price. This fishery is also seasonal and mainly occurs in winter and spring. The by-catch of this fishery is mainly *Epigonus telescopus*, *Aphanopus carbo* and the landings are shown in Table 4.

A limited fishery, during the second part of the year, targeting deep-water Red crabs (*Chaecon affinis*) has developed since 1988 on the "Galician Bank" (ICES Division VIIIc and IXb). Big traps are used for this purpose, baited mainly with sardine, horse mackerel and occasionally mackerel. The lack of available data for 1990 and 1994 makes no possible to analyse the evolution of the fishery for the whole period 1989-1996. In general from 1989 till 1995, the landings trend to increase (Table 5). In 1995, only 2 ships in Galicia were operating, they were from "A Coruña" and "El Grove". In 1996, only one vessel remained, operating during the period of June-October and fishing on the slope of continental shelf at a depth of between 900-1300 m. This fleet consisted of small ships, with a crew of around 5 fishermen. The gear was a type of trap which is shown in Figure 3, the mean weight of the trap is 10 kg and the number of traps (nasas) used per trip was never less than 100 traps.

The discards in this fishery were very scarce and mainly *Bathynectes maravigna*, and occasionally *Cancer bellianus* and *P. blennoides*. Since 1997, activity has decreased and no current data on the activity of this fleet is available. We consider that the Red crab (*Chaecon affinis*) fishery has disappeared due to the fact that other species of crabs (*Maja squinado*) are imported and its sale on the market has more competitive prices.

Since 1982, a fishery focusing on red Seabream (*P. bogaraveo*) has been established in the South of Spain (Gulf of Cadiz, ICES Div. IXa). This deep water fishery is only based on artisanal long-liners from Tarifa harbour (SW of Spain) operating in Spanish waters of ICES Div. IXa practically throughout the year (Sobrino et al, 1995). This fishery is quite important since the landings in recent have been increasing in the last years and the high price reached in the market. The fleet in 1993 consisted of 70 vessels characterised by their small dimensions, by the short duration of their trips (one-day) and the size of crew, 3-4 persons. The average values are: length overall = 9.1 m.; Engine power = 62 HP and GRT = 6 t. The gear is a type of deep long-line called "Voracera" (Anon, 1994). The composition of the catches is mainly *P. bogaraveo* and occasionally *Brama brama*. Since 1997, the fleet has increased to 98 vessels in Tarifa and 15 vessels in Algeciras harbours. The landings are presented in Table 6.

### *c) New Directed Fisheries on Deep-water species.*

The new directed deep-water fishery, established in Bay of Biscay (ICES Divisions VIIIa,b,d) began in 1996 and continues at present with the same characteristics of the fleet. The great diversity of vessel dimensions (length: 9-32 m), engine power (70-900 HP) and GRT (14-264 t.) depends on the distance from the ports to the fishing area. The landings from 1996 and 1997, the number of vessels and trip duration are presented (Table 7). The catch data for different species in this fishery are registered differently according to the target species of each vessel. The skipper records the target species with a name and as "Others" are recorded the untargeted species. Because of this, the group "Others" presents higher values.

In the second half of 1996, five trawlers with conventional deep-water trawl gears, started a new deep-fishery in the Northeast of ICES Subarea XII, in an area called Hatton Bank. This fishery is a multispecific, highly diversified fishery and the fleet involved is characterised by overall lengths of between 47-67 m and engine power of between (800-2000 HP). The estimated catches from 1996 and 1997 and discards by species are shown in Table 8.

In 1997, three trawlers began to fish on the slope of Galicia continental shelf (NW of the Spain, ICES Divisions IXa) sporadically in an isolated way. The deep hauls are carried out when the catches of the traditional fishery come down. The effort and catches of these small trawlers (HP<500) which are pioneers in the fishing in deep-waters of the continental slope are small. Table 9 shows the catches and effort from 1997 year in the period January-August.

## **DISCUSSION**

Generally, it may be said the deep-sea Spanish fisheries are basically opportunistic, are characterised by their seasonality and small catch volumes. Target species change from one season to another in the year depending on the abundance of other species with a commercial value and on the constrictions on fish licences in terms of TACs and Quotas systems.

In years when hake catch presents low volumes, the long-liners dedicated to this fishery in the Cantabrian sea (ICES Divisions VIIIc), redirect their activity to deep-water species, i.e., Great forkbeard (*Phycis blennoides*) or deep-water sharks. In this sense, these fisheries develop with more or less intensity according to the good results of the traditional fisheries (mainly hake fishery) or the duration of the seasonal fisheries throughout the year (tuna fishery in summer, mackerel fishery in spring, etc.).

Likewise, due to the narrow continental shelf off the North and Northwest of the Spanish coast, the fishing of deep species is quite accessible for most ships on the Cantabrian coast. This originates the scattering of a great variety of ships with different lengths and target species, along the numerous and small harbours of the coast. Thus, from one day to other the target species can change according to the weather conditions, market price, etc.

The description of the deep-water fisheries associated with the Sub-areas VI-VII and Divisions IXa, VIIIabd, VIIIc, is difficult since they comprise different groups of target species, different types of vessel, a wide geographical area and catches landed in local markets which are not always easily accessible. Thus, the catch data for different species is registered differently depending on the target species. So the statistics shows groups of non-target species classified under "Others", so that the group of "Others" presents very high values and covers various species in each port and year.

This situation makes further control necessary (interviews with the skippers, fish sellers, vessel owners) at all the harbours along the coast, to know the changes in the target species of the fleet at each harbour.

All this affects the dates of landings of deep species, showing high fluctuations annually, and even monthly, according to the circumstances outlined above. In conclusion, the deep-fisheries developed in the North and Northeast of Spain are "jokers" or alternative fisheries that make it possible to continue fishing when the traditional fisheries fail.

In addition, responding to the expansive nature of these deep-fisheries, and due to the fall in catches in the traditional fisheries and the licence restrictions for certain fleets, experimental campaigns are underway in Galician Waters. In this regard, since 1996, some experimental fishing surveys have begun in deep waters of the continental slope in Galician waters (Piñeiro et al 1997) and on the "Galician Bank" (ICES Division VIIIc, IXa and IXb). The purpose has been to explore the sources in deep Galician waters trying to identify the species community and to know the yield of the most important species. The surveys were conducted at different times of the period 1996-1998 and with different gears (bottom trawl and long line) and the depth range explored was between 500-1300 m.

The most abundant species caught on the continental slope, by order of importance, were: *D. calceus*, *T. scabrus*, *G. melastomus* and *T. cristulata*. In the Galician Bank, the yields of deep-water sharks (*C. squamosus*, *C. granulosus* and *C. coelolepis*) were higher those from Teleosts (*B. splendens* and *M. moro*).

Since the beginning of the exploitation of these fisheries in the 1980s, progress have been made in gaining knowledge of the fishing grounds, areas of distribution of deep water species and their biology, but new research programmes are necessary on the environmental influence in their behaviour, their interactions and the physiology of these species.

Finally, it must be said that although these fisheries are expanding, many of which being established fisheries, there is still insufficient information available to make an assessment of fisheries for deep-sea resources (ICES, 1998). Further data would be necessary to know the status of the stocks and the catch possibilities of the more commercially interesting species from the viewpoint of responsible fishing. However, thanks to information gathered during the EC FAIR Project (Deep water fisheries, CT 95/655) and the work carried out under "the ICES Study Groups on the biology and Assessment of Deep-sea fisheries resources", at the moment, it is possible to advise, with a precautionary approach, on some of the most important deep water stocks in the North Atlantic.

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## REFERENCES

- ANON (1994). Las Artes de Pesca en el Litoral Gaditano. De. Diputación Provincial de Cádiz. 307 pp.
- HOPPER A.G. (1995) .Deep-Water Fisheries of the North Atlantic Oceanic Slope. Kluwer Academic Publishers. Printed in the Netherlands
- IGLESIAS S AND J. PAZ (1995). Spanish North Atlantic Deep-water fisheries; in A.G. Hopper (de.), Deep -Water Fisheries of the North Atlantic Oceanic Slope
- ICES (1996). Report of the Study Group on the Biology and Assessment of Deep-Sea Fisheries Resources. C.M. 1996/Assess: 8.
- ICES (1997). Report of the Study Group on the Biology and Assessment of Deep-Sea Fisheries Resources. C.M. 1997/Assess: 17.
- ICES (1998). Report of the Study Group on the Biology and Assessment of Deep-Sea Fisheries Resources. C.M. 1998/ACFM:12.
- PIÑEIRO, C.G<sup>a</sup>., J.M. CASAS, R. BAÑON, A. SERRANO, A. CALVIÑO (1997). Resultados de la Acción Piloto de Pesca Experimental en el Talud de la Plataforma Gallega (Noroeste de la Península Ibérica). Datos Resúm. Ins. Esp. Oceanogr., Núm. 3, pp57.
- SOBRINO I., JIMENEZ M.P., RAMOS F., BARO J. (1994). Descripción de las Pesquerías Demersales de la Region Suratlantica Española. Inf. Tec. Inst. Esp. Oceanogr. v: 151, pp: 79.

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The first of the year was a very dry one, and the crops were much affected.

The second of the year was a very wet one, and the crops were much affected.

The third of the year was a very dry one, and the crops were much affected.

The fourth of the year was a very wet one, and the crops were much affected.

The fifth of the year was a very dry one, and the crops were much affected.

The sixth of the year was a very wet one, and the crops were much affected.

The seventh of the year was a very dry one, and the crops were much affected.

The eighth of the year was a very wet one, and the crops were much affected.



Table 1 .- Spanish landing (in tonnes) of *Phycis spp.*, *Molva spp.* and *Pagellus spp.* as by-catch of the Deep-water fisheries obtained in ICES Sub-Areas VI+VII, Divisions VIIIab and Division VIIIc in the period 1990-1997.

| <i>Phycis spp.<sup>a</sup></i> |       |           |         |        | <i>Molva spp.</i> |        |           |         |        | <i>Pagellus spp.<sup>a</sup></i> |       |           |         |       |
|--------------------------------|-------|-----------|---------|--------|-------------------|--------|-----------|---------|--------|----------------------------------|-------|-----------|---------|-------|
| VI, VII                        | Trawl | Long Line | Gillnet | Total  | VI, VII           | Trawl  | Long Line | Gillnet | Total  | VI, VII                          | Trawl | Long Line | Gillnet | Total |
| 1990                           | 903.4 | 468.2     |         | 1371.6 | 1990              | 1358.4 | 2164.0    |         | 3522.4 | 1990                             | 14.7  | 58.7      |         | 73.4  |
| 1991                           | 636.6 | 316.4     |         | 953.0  | 1991              | 964.2  | 1250.2    |         | 2214.4 | 1991                             | 8.6   | 21.3      |         | 29.9  |
| 1992                           | 387.4 | 357.1     |         | 744.5  | 1992              | 926.1  | 977.1     |         | 1903.2 | 1992                             | 3.1   | 14.9      |         | 18.0  |
| 1993                           | 363.2 | 460.6     |         | 823.8  | 1993              | 457.8  | 819.8     |         | 1277.5 | 1993                             | 1.3   | 9.0       |         | 10.3  |
| 1994                           | 618.2 | 383.8     |         | 1002.0 | 1994              | 678.7  | 969.7     |         | 1648.4 | 1994                             | 0.8   | 8.5       |         | 9.3   |
| 1995                           | 252.9 | 317.3     |         | 621.2  | 1995              | 250.3  | 981.8     |         | 1340.3 | 1995                             | 1.0   | 1.1       | 2.5     | 4.6   |
| 1996                           | 696.8 | 622.9     |         | 1319.6 | 1996              | 403.7  | 1599.8    |         | 2003.5 | 1996                             | 2.4   | 21.9      |         | 24.3  |
| 1997                           | 259.6 | 1.22      |         |        | 1997              | 1533.5 |           |         |        | 1997                             |       |           |         |       |
| VIIIab                         | Trawl | Long Line | Gillnet | Total  | VIIIab            | Trawl  | Long Line | Gillnet | Total  | VIIIab                           | Trawl | Long Line | Gillnet | Total |
| 1990                           | 45.6  | 10.5      |         | 56.1   | 1990              | 147.2  | 115.4     |         | 262.6  | 1990                             | 13.8  | 45.6      |         | 59.4  |
| 1991                           | 4.6   | 17.2      |         | 21.8   | 1991              | 60.7   | 89.9      |         | 150.6  | 1991                             | 2.4   | 25.7      |         | 28.1  |
| 1992                           | 21.0  | 21.1      |         | 42.1   | 1992              | 29.8   | 141.6     |         | 171.4  | 1992                             | 1.4   | 11.3      |         | 12.6  |
| 1993                           | 44.4  | 5.4       |         | 49.8   | 1993              | 1.5    | 92.8      |         | 94.2   | 1993                             | 1.1   | 33.0      |         | 34.2  |
| 1994                           | 85.1  | 15.8      |         | 100.9  | 1994              | 57.8   | 19.5      |         | 24.2   | 1994                             | 1.6   | 1.4       |         | 3.0   |
| 1995                           | 37.5  |           |         | 37.5   | 1995              | 28.8   | 59.1      |         |        | 1995                             |       |           |         |       |
| 1996                           | 20.4  | 36.8      |         | 57.2   | 1996              | 23.7   | 144.1     |         |        | 1996                             |       |           |         |       |
| 1997                           | 22.5  | 26.9      |         |        | 1997              | 17.4   | 68.3      |         |        | 1997                             | 0.1   | 22.3      |         |       |
| VIIIc                          | Trawl | Long Line | Gillnet | Total  | VIIIc             | Trawl  | Long Line | Gillnet | Total  | VIIIc                            | Trawl | Long Line | Gillnet | Total |
| 1990                           | 88.1  | 68.4      | 5.2     | 161.7  | 1990              | 0.5    |           |         | 0.5    | 1990                             | 67.1  | 126.8     | 27.0    | 220.8 |
| 1991                           | 26.7  | 58.5      | 0.7     | 85.8   | 1991              | 30.7   | 121.5     |         | 152.2  | 1991                             | 9.6   | 66.3      | 20.3    | 96.2  |
| 1992                           | 60.9  | 58.3      | 0.7     | 119.9  | 1992              | 4.0    | 119.9     |         | 123.9  | 1992                             | 7.7   | 70.8      | 27.8    | 106.4 |
| 1993                           | 255.7 | 79.4      | 1.7     | 336.8  | 1993              | 0.6    | 44.3      | 0.1     | 45.0   | 1993                             | 7.4   | 98.2      | 31.8    | 137.3 |
| 1994                           | 178.7 | 37.9      | 2.4     | 219.1  | 1994              | 0.0    | 0.1       | 0.0     | 0.1    | 1994                             | 5.3   | 83.6      | 38.8    | 127.7 |
| 1995                           | 131.5 |           |         | 243.6  | 1995              | 2.1    | 6.5       |         | 8.6    | 1995                             | 9.1   | 85.3      |         | 94.4  |
| 1996                           | 112.1 | 15.1      |         | 127.2  | 1996              | 6.5    | 18.7      |         | 25.2   | 1996                             | 0.2   | 8.4       |         | 8.6   |
| 1997                           | 76.9  | 54.4      |         |        | 1997              | 54.2   | 141.2     |         |        | 1997                             | 1.2   | 21.5      |         |       |

a Main catches of *Pagellus sp.* might be considered as *P. bogaraveo*.

b Main catches of *Phycis spp.* might be considered as *Phycis blennoides*.

Table 2.- Landings (in kg) of the long-line Fishery in La Coruña Port from 1991 to 1994 in ICES Subarea VI and VII.

| SPECIE / YEAR         | 1991    | 1992    | 1993    | 1994   |
|-----------------------|---------|---------|---------|--------|
| Deeper sharks         | 168.401 | 330.883 | 234.049 | 45.879 |
| Total number of boats | 10      | 12      | 11      | 11     |

Table 3.- Landings (in kg) of Sharks in Cantabrian Sea and Galicia, North-west of Spain ports for the period 1991-1997 in ICES Division IXa, VIIIc and VIIIab.

| PORT / YEAR          | 1991   | 1992   | 1993    | 1994    | 1995               | 1996 <sup>a</sup> | 1997    |
|----------------------|--------|--------|---------|---------|--------------------|-------------------|---------|
| LA CORUÑA            |        | 35.430 | 49.215  | 100.670 |                    |                   |         |
| CARIÑO               | 20.991 | 7.652  | 101.308 | 101.881 | 53.927             | 89.697            |         |
| BURELA               | 10.437 |        | 24.194  | 896     |                    |                   |         |
| FISTERRA             |        |        |         |         | 2.669 <sup>a</sup> | 34.356            |         |
| ONDARROA             |        |        | 16.0931 | 81.436  | 73.057             |                   |         |
| S. V. DE LA BARQUERA |        |        |         |         |                    | 213.081           | 433.003 |
| VIGO AND MARIN       |        |        |         |         |                    |                   | 50.618  |
| Total landings       | 31.428 | 43.082 | 335.648 | 284.883 | 129.653            | 337.134           | 483.621 |

a Landings for December.

b Landings from January to July.

Table 4.- Landings (in kg) for the long-line *Phycis blennoides* fishery in Northern Spain (Cantabrian Sea ports), in ICES Division VIIIc.

| SPECIES                    | 1996    | 1997    |
|----------------------------|---------|---------|
| <i>Phycis blennoides</i>   | 199.481 | 171.379 |
| <i>Epigonus telescopus</i> | 364     |         |
| <i>Aphanopus carbo</i>     | 321     |         |

Table 5.- Landings (in kg) of Deep-Water Red Crab (*Chaecon affinis*) in Northern Galician ports for the period 1989-1996 in ICES Division VIIIc, IXb.

| PORT / YEAR | 1989             | 1991             | 1992              | 1993               | 1995              | 1996              |
|-------------|------------------|------------------|-------------------|--------------------|-------------------|-------------------|
| MUXÍA       | -                | -                | 4499 <sup>a</sup> | 80                 | 6424 <sup>a</sup> | 4923 <sup>e</sup> |
| CEDEIRA     | 912 <sup>b</sup> | 19               | -                 | -                  | -                 | -                 |
| CORUNA      | -                | -                | -                 | 11381 <sup>e</sup> | -                 | -                 |
| BURELA      | -                | 384 <sup>d</sup> | -                 | -                  | -                 | -                 |
| TOTAL       | 912              | 403              | 4499              | 11461              | 6424              | 4923              |

a Jul -Sept  
b Oct

c Jul -Nov  
d Nov-Dec

e May-Aug

Table 6.- Landings (in tonnes) by quarter of Red Seabream (*Pagellus bogaraveo*) obtained in Gulf of Cadiz\* in the period 1993-1997.

| YEARS | 1 <sup>st</sup> | 2 <sup>nd</sup> | 3 <sup>rd</sup> | 4 <sup>th</sup> | TOTAL |
|-------|-----------------|-----------------|-----------------|-----------------|-------|
| 1993  | 163             | 291             | 130             | 180             | 765   |
| 1994  | 130             | 332             | 211             | 181             | 854   |
| 1995  | 98              | 211             | 115             | 77              | 502   |
| 1996  | 185             | 201             | 128             | 145             | 659   |
| 1997* | 101             | 272             | 82              | 613             | 516   |

\* Landings from Algeciras harbour (15 vessels) are not registered.

Table 7.- Landings (in Kg) of the long-line fishery in ICES Division  
VIIIabd. 1996 and 1997.

| SPECIES                                      | 1996    | 1997    |
|--|---------|---------|
| <i>Phycis spp.</i>                           | 37.710  | 77.278  |
| <i>Mora moro</i>                             | 13.870  | 30      |
| <i>Pagellus bogaraveo</i>                    | 20      | 240     |
| <i>Helicolenus dactylopterus</i>             | 2.722   | 9.488   |
| <i>Conger conger</i>                         | 13.816  | 6.230   |
| <i>Trachyscorpia cristulata</i>              | 2.524   | 14.990  |
| <i>Squalus acanthias</i>                     | 80.200  | 98.580  |
| <i>Centrophorus squamosus</i>                | 136.626 | 142.556 |
| <i>C. coelolepis</i> + <i>Deania calceus</i> | 36.455  | 38.123  |
| <i>Galeus melastomus</i>                     |         | 26.350  |
| <i>Molva molva</i>                           | 70.649  | 186.499 |
| <i>Polyprion americanus</i>                  | 33.401  | 31.677  |
| <i>Molva dypterygia</i>                      | 805     | 14.063  |
| <i>Beryx decadactylus</i>                    | 774     | 2.535   |
| <i>Raja spp.</i>                             | 1.320   |         |
| <i>Beryx splendens</i>                       | 5.405   | 17.748  |
| <i>Aphanopus carbo</i>                       |         | 1.060   |
| <i>Hoplostethus atlanticus</i>               |         | 21.775  |
| Others                                       | 150.331 | 809.650 |
| Number of Vessels                            | 32      | 27      |
| Number of days                               | 1.563   | 1.236   |

Table 8.- Estimated total catches, discards (in tonnes) and yields (kg/hour) of the main species  
caught in Hatton Bank by the spanish fleet in 1996 and 1997 (ICES Subarea XII).

| Species                                 | 1996        |         |         | 1997        |         |         |
|---|-------------|---------|---------|-------------|---------|---------|
|   | Total catch | Discard | kg/hour | Total catch | Discard | kg/hour |
| <i>Centroscymnus spp</i> <sup>(1)</sup> | 534         | 1.6     | 79.7    |             |         |         |
| <i>Centroscymnus coelolepis</i>         |             |         |         | 555.0       | 2.1     | 65.7    |
| <i>Coryphaenoides rupestris</i>         | 1136        | 68.8    | 179.2   | 1800.3      | 80.4    | 221.7   |
| <i>Molva dypterygia</i>                 | 367.9       |         | 54.7    | 410.7       | 1.5     | 48.6    |
| <i>Aphanopus carbo</i>                  | 252.9       | 69.4    | 47.9    | 98.4        | 0.6     | 11.7    |
| <i>Alepocephalus bairdii</i>            | 230.3       | 31.9    | 39.0    | 1158.0      | 22.5    | 139.1   |
| <i>Alepocephalus spp</i>                |             |         |         | 2534.0      | 105.6   | 311.1   |
|   | Hours/hauls |         |         | Hours/hauls |         |         |
| Effort surveyed                         | 2241/405    |         |         | 2828/509    |         |         |
| Effort estimated                        | 6723/1215   |         |         | 8484/1527   |         |         |

(1) mainly *C. coelolepis*

Table 9.- Landings (in kg) of the trawl fisheries in ICES Division IXa from the period January – August, 1997.

| Species                                  | Landing (Kg) |
|--|--------------|
| <i>Galeus melastomus</i>                 | 1375         |
| <i>Deania calceus</i>                    | 3183         |
| <i>Trachyrhynchus scabrus</i>            | 2814         |
| <i>Phycis spp + Mora moro</i>            | 94.5         |
| <i>Trachyscorpia cristulata echinata</i> | 1161.5       |
| <i>Helicolenus dactylopterus</i>         | 43           |
| <i>Hoplostethus mediterraneus</i>        | 600          |
| Number of vessels                        | 3            |
| Number of days                           | 12           |
| Hauls number                             | 18           |

Figure 1.- Map showing different areas of deep fisheries exploited by spanish fleet

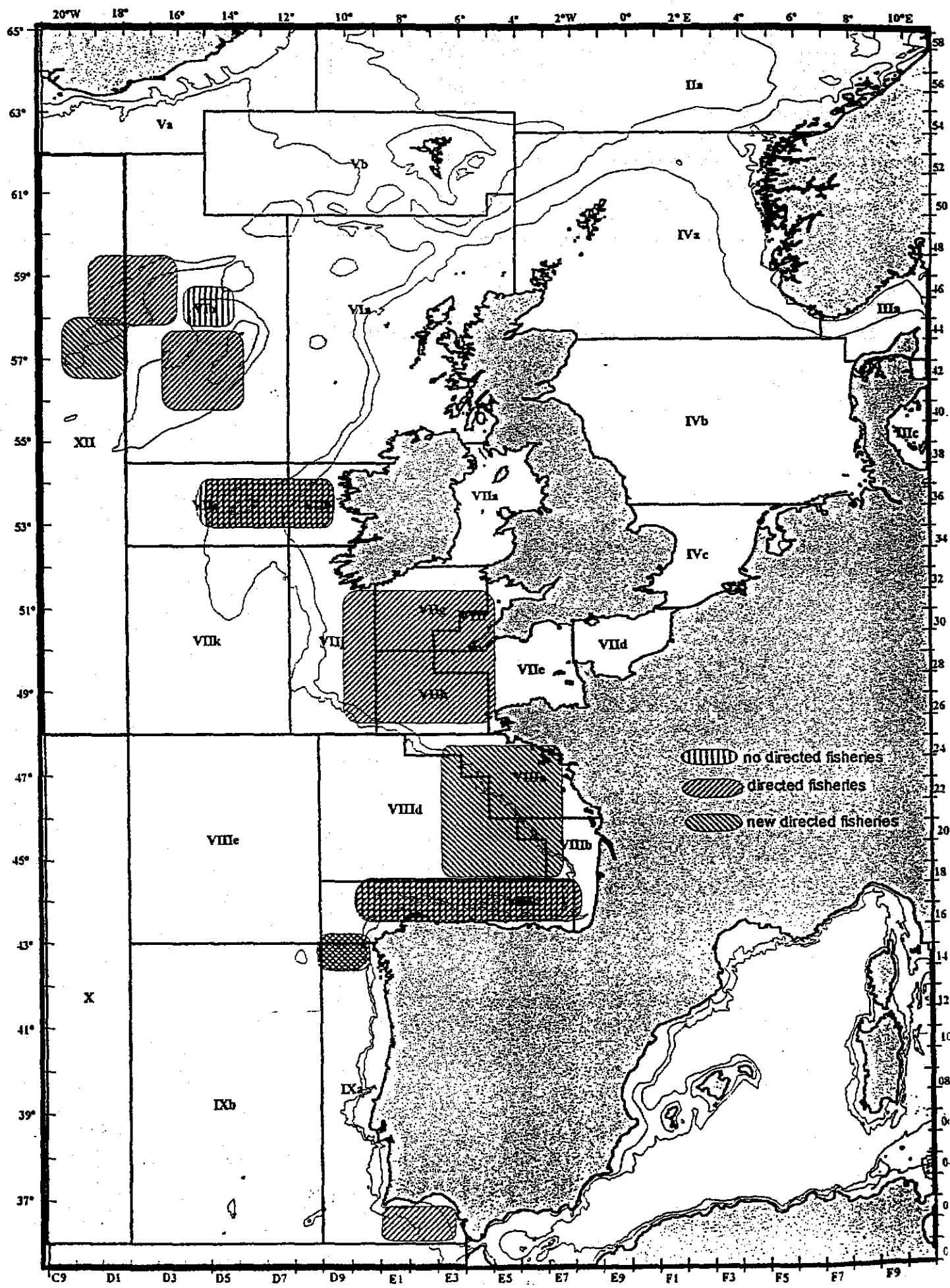


Figure 2.- Longline scheme of deep-water sharks fishery.

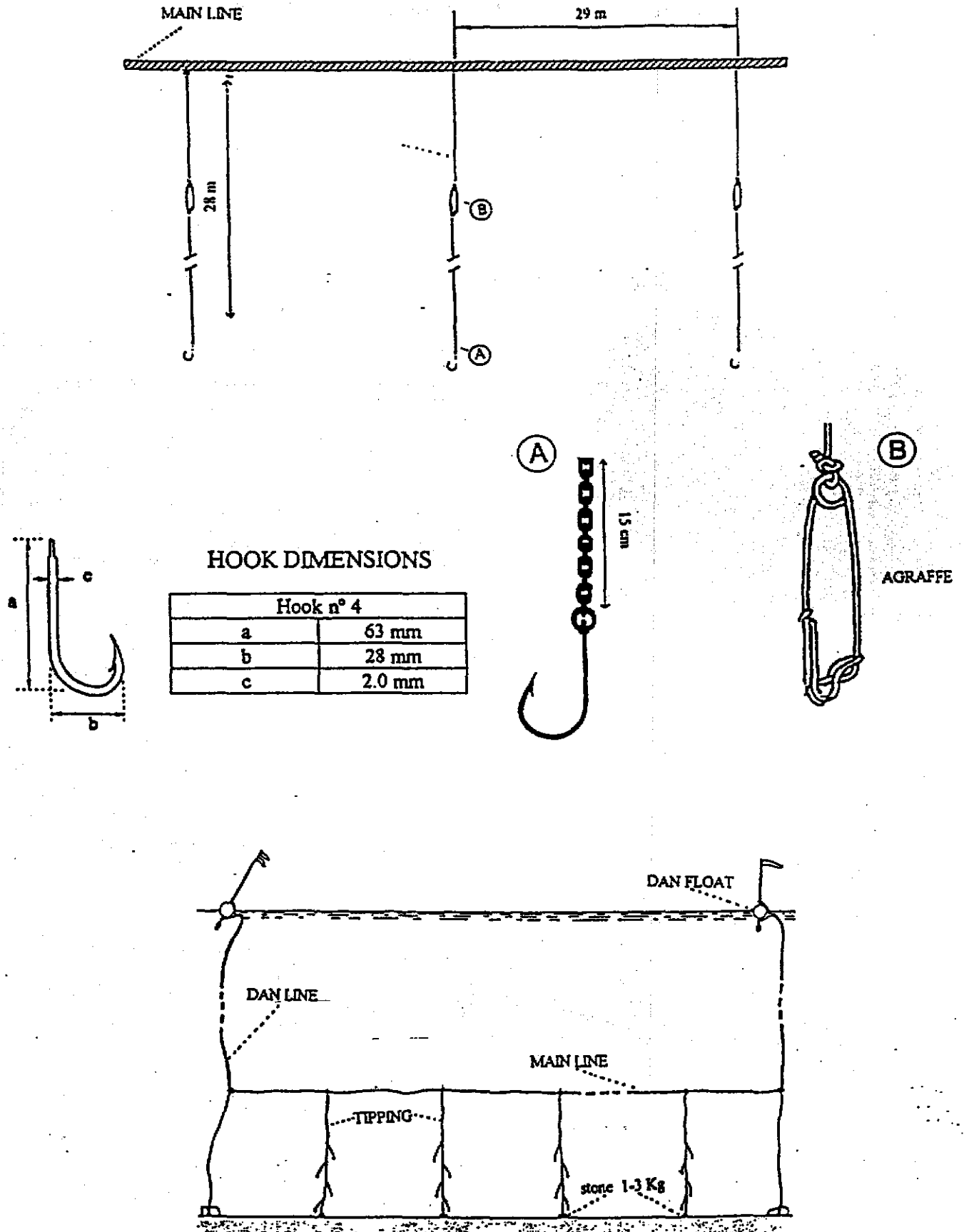


Figure 3.- Pot Scheme of deep-water red crab fishery.

