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# **DATA COLLECTION FOR THE FISHERIES SECTOR**

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**PORTUGAL\_NP-PROPOSAL\_2011-2013**

Lisbon, September\_ 2010

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## **I. General framework**

The Portuguese Multiannual Data Collection Programme for 2011-2013, responds to the legal requirements laid down in the Council Regulation (EC) n°.199/2008 of 25<sup>th</sup> February 2008, the Commission Regulation (EC) n°.665/2008 of 14 of July 2008, and the Commission Decision 2010/93/UE of 18 of December 2009.

The aforementioned Multiannual Data Collection Programme was elaborated having in mind the SGRN Guidelines for the submission of National Programme.

## **II – Organisation of the National Programme**

### **II.A. National organisation and coordination**

#### **II.A.1. National Correspondent**

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DGPA, is also responsible for the coordination of the National Programme, and for gathering the data related with Economic variables (fleet, aquaculture and processing industry) and Transversal variables in Mainland.

#### **II.A.2. Participating Institutes**

There are five organisations/institutes involved in the planning and implementation of the Portuguese Program for the Collection of Fisheries Data.

##### **Instituto Nacional de Recursos Biológicos (INRB/L-IPIMAR)**

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IPIMAR is the Institute responsible for the collection of biological data under the DCF for the Mainland. It is also responsible for the provision of scientific advice for the fisheries sector in the Mainland.

##### **Secretaria Regional do Ambiente e Mar/Gab.Subsecretário Regional das Pescas (RAA)**

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RAA is responsible for gathering data related with Economic variables in the Autonomous Region of Azores.

**Departamento de Oceanografia e Pescas da Universidade dos Açores (DOP/UAc)**

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DOP is a department of the University of the Azores which is responsible for the collection of scientific data under the Data Collection Framework. DOP/UAc is also responsible for the provision of scientific advice for the fisheries sector of the Autonomous Region of the Azores.

**Direcção Regional de Pescas da Região Autónoma da Madeira (DRPM/RAM)**

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The collection of data from the fisheries sector of the Autonomous Region of Madeira, in the framework of this programme, is carried out by the Madeira Service Directorate of Fisheries Research (DSIP), which is a branch of the Regional Directorate of Fisheries of Madeira from the Environment and Natural Resources Secretary of the Regional Government of Madeira.

**II.A.3 National coordination**

The main aims of the National coordination meetings that are planned for the NP 2011-2013, are to assist the Institutes involved in overcome the technical and financial problems that could happen during the implementation of the National Programme.

**II.B International coordination**

See Table II.B.1 in file: Portugal\_NP-Proposal\_Tables\_2011-2013.

**II.C Regional coordination**

See the elements of regional coordination in the relevant NP Proposal sections.

### **III. Module of evaluation of the fishing sector**

#### **III.A - General description of the fishing sector**

The national fishing fleet is extremely diverse, differing between zones. This is related to the activities carried out and the fishing technology used in each zone. It is dominated in numbers by small wooden vessels, most of which are open decked. This reflects the fundamentally artisanal nature of the activity, which is nevertheless extremely important for a significant part of the coastal communities.

In terms of national distribution, the fishing fleet is distributed between 45 Registration Ports. Of these, 27 are Port Authorities and 18 are Maritime Delegations. On Mainland are located 32 of the main ports, 11 are in the Autonomous Region of the Azores and 2 are in the Autonomous Region of Madeira.

The national waters can be divided into three large fishing zones: the sub-area of the EEZ of the Mainland and those of the Autonomous Regions of the Azores and Madeira.

The sub-area of the EEZ of the Mainland has a narrow continental shelf and is located in a transitional area in terms of productivity. The sub-area is characterised by a great variety of species, none of which, however are abundant. On the Mainland, fishing activities are carried out on grounds close to the coast, and they exploit a small group of species (sardine, horse mackerel, mackerel, chub mackerel, hake, monkfish, silver scabbard fish, octopus and clams). Of these species, sardine is almost half of the total catch in this area.

The Autonomous Regions of the Azores and Madeira also have a narrow continental shelf. Given their oceanic nature, there is a reduced number of shoals of fish, and the island's platforms which make up the fishing zone are fairly irregular. In the Azores, the blackspot seabream is the most important demersal species, while in Madeira the black scabbard fish is the most important.

#### **Mainland**

##### **Fisheries in ICES sub-areas I, II, XII, XIV, NAFO Div. 1F and Sub-area 3**

The Portuguese fleet operating in the Irminger Sea, Norway and Svalbard (9 ships were in operation in 2008) also operated in the NAFO area (10 ships in 2008). This fleet uses bottom trawling techniques in the NAFO area, Norway and Svalbard (Div. IIa, b) and midwater trawling techniques in the Irminger Sea (Div. XII and XIVb) to targeting redfish. This long distance fleet is composed by 13 ships.

##### **Fisheries in ICES Sub-areas I and II (Norway and Svalbard) and international waters (Div.IIa)**

In 2008, the Portuguese nominal catches caught in Norway (Div I and IIa), Svalbard (Div. IIb) and International waters (Div.IIa) recorded 6,023 ton with a total number of 480 fishing days: 5,399 t (421 fishing days) proceeding from the traditional grounds of both

Divisions I and II and 624 t (59 fishing days) proceeding from the redfish pelagic fishery in the “Banana Hole” zone (international waters of Div. IIa).

For the period from 1993 till 2007 cod (*Gadus morhua*) is the most important species in the catches, with the exception of 1993 in Division IIa. In the recent years 60% of the fishing effort has been deployed in Norway zone (Division IIa), corresponding to a same percentage in catch allocation (not including the new fishery in the “Banana Hole” zone).

#### Sebastes Mentella fishery in ICES Div. XII, XIVb and NAFO Div. 1 F

The redfish Portuguese trawl pelagic fishery in the area started in 1994, at first in the Irminger Sea but now this fishery is wide spread till NAFO Divisions 1F, 2H, 2J and 3K. Redfish from the species *Sebastes mentella* essentially supports this fishery. The Portuguese nominal redfish catches recorded a peak in 1995 (5,125 t and 383 fishing days).

In 2008, the effort was 250 fishing days (deployed only in Div. XIVb) and the catches decreased to the level of 1994, the first year of this fishery (around 1800 ton) when the same amount of catches was caught in 136 fishing days.

From the available data of only two vessels the level of redfish rejected in 2008 was 0.6% of the catch

The Portuguese fleet operating in the ICES Div. XIVb, in 2008, was composed by 6 trawlers.

#### Fishery in the NAFO Sub-Area 3

In 2008, the Portuguese nominal catches proceeding from NAFO Regulatory Sub Area 3 remains stable and it have reached a similar value (13 004 t) that recorded since 2004.

The by-catch of cod has doubled, reaching the highest value of the last 9 years (except 2003). The by-catch of witch flounder also doubled. The catch of roughhead grenadier more than doubled, but kept at low level relatively recent years. The catch of skates and white hake remains stable at the same level of 2007. The by-catch yellowtail flounder fall by half and the by-catch of American plaice has fall around 20%.

Redfish continues to be by far the most important species in the Portuguese commercial catches from Sub Area 3, representing in recent years more than 50% of the overall catch. In 2008, Div. 3M has replaced Div. 3O like the most important ground for the redfish fishery (4774 t against 3457 t), but equal value of the total catches in each division (85%).

The Greenland halibut catches remains stable in all divisions, except in the Div. 3M, where the catches increased 100 ton. In Div. 3L, due to the continuously decrease in the catches of roughhead grenadier over recent years, the bulk of the catch is now represented by Greenland halibut and redfish (around 90%, the same level of the bulk Greenland halibut/roughhead grenadier in years before). In Div. 3N the relative weight of these two species has been declining from 76% in 1998 to 35% in 2004-2005, 11% in

2006 and fall to 4% in 2007-2008. In this division, the skates continue to be the most important fishery, with 60-70% of total catch in the last three years (37% in 2005).

In 2008 the fishing effort was 1163 fishing days in sub-area 3.

#### Fishery in the Mediterranean and Black Sea

In 2008, the Portuguese nominal catches totaled 41 tons, 80% of which was shrimp (*Dendrobranchiata*). There were 7 vessels operating in this area, ranging 7 to 167 GT. Vessels operating in this area operate mainly in the Atlantic Ocean. This means that these vessels are allocated to supra-region AREA27.

In 2008 the fishing effort was 218 fishing days.

#### Fishery in the WECAFC

Fisheries in this area are very sporadic. In 2007 there was only three vessels in the area, totaling 64 fish days and one vessel in 2008 totaling 10 fish days.

#### Bottom Trawl Fishery in Div. IXa

The bottom trawl fishery comprises two fleet components e.g., the trawl fleet catching demersal fish (65-mm mesh size) and the bottom trawl fleet directed at crustaceans ( $\geq 55$  mm mesh size for shrimps and above 70 mm for Norway lobster). In 2008, 99 vessels operated in this fishery, 30 of which were licensed for crustaceans. The catches of bottom trawl fishery represents 12 % of the total landed in Div. IXa (Portuguese coast).

The trawl fleet targeting fish (hake, horse mackerel, axillary sea breams, pouting, octopus, squids, blue whiting) operates off the entire Portuguese coast mainly at depths between 100 and 250 m, while the fleet targeting crustaceans (Norway lobster and rose shrimp) operates mainly in the Southwest and South in deeper waters, from 100 to 750 m.

Trawl fishing effort in Portuguese continental waters has been recorded since 1950 until present as hours or days fished. It can be seen that effort increased until the early 1970s, and has since then decreased to levels similar to those of the 1950s (ICES Advice, 2006. Volume 7).

#### Artisanal Fishery in Div IXa

The artisanal fishery is composed of a large number (around 7500) of small boats, operating mainly inshore and using a variety of gears as gillnets and trammel nets (the majority), purse seine, beam trawls, longlines, traps, pots and dredges. A large number of these boats (overall length less than 12 meters) are licensed for more than one type of gear.

Often it is used several different gears in the same trip. Depending of the species availability this fishery use also different gears by season. The main species landed are hake, pouting,

sole, cuttlefish and anglerfish from gillnets and trammel nets, sardine, horse mackerel and mackerel from purse seine, hake, conger, skates and black scabbardfish from longlines, octopus from traps and pots, bivalves from dredges and coastal shrimps from beam trawl.

The large number of small boats (< 12 m) involved in this fishery has a mean GRT of 2 and an average of 15 KW engine power.

The artisanal fishery represents 43% and 58% in weight and value, respectively, of the total commercial species landed in 2008.

#### Purse-seine fishery in Div IXa

The purse-seine fishery, the most important in landings volume, is composed of around 130 purse seines with a total catch of 74 778 t in 2008. This fleet targets mainly sardine, which constitutes 82% of their landings in 2008, using a mesh size of 16 mm. Other target species are horse mackerel and Spanish mackerel.

Sardine is the basis of this fishery in Portugal and represents an important source of income for local economies (ICES Advice, 2008. Volume 7).

#### The black scabbardfish long-line fishery in Div. IXa

The Portuguese deep-water longline fishery targets Black scabbard fish (*Aphanopus carbo*) and the fleet is composed by 17 vessels. All vessels from this fleet are registered at Sesimbra harbour that is also the base for their fishing activities. Fishing grounds are located in a limited area at hard grounds along canyon slopes off Sesimbra, South of Lisbon.

Portuguese dogfish (*Centroscymnus coelolepsis*) and leafscale gulper shark (*Centrophorus squamosus*) are the main by-catch species and before the recently introduced EU fishing restrictions their landings represented an important additional income.

The black scabbardfish fishery started in 1983 at grounds around Sesimbra port, following some exploratory surveys conducted by IPIMAR in close collaboration with the fisheries sector. These surveys involved searching for fishing grounds for the species and experimental longline fishing. Fishermen from Madeira with extensive experience in deep-sea longline fishing have greatly contributed to these experiments.

#### The Swordfish Fishery in Atlantic Ocean

There is a drifting pelagic longline fishery in Atlantic Ocean, targeting swordfish but catching a considerable amount of other highly migratory species such as sharks and tuna. The fleet is composed of 66 vessels with a mean GRT of 62,8 MT, an average of 239,5 kW engine power and a mean overall length of 19 meters. The main landing ports for swordfish in Portugal mainland are Sesimbra (24% of the total catch in 2008) and Peniche (76% the total catch in 2008). However, the majority of the catch is landed in foreigner ports, namely Vigo (Spain), taking advantage of better commercial prices and market.

### The Surface Longline Fishery in Indian Ocean

In 2008 the Portuguese longline fishery in Indian Ocean (East and West) comprised 26 vessels, ranging from 187 to 764 GT. Target species are Swordfish and Blue shark.

In the same year, this fleet activity's outcome was a total catch of around one thousand tonnes. From those, about 76% were Swordfish and Blue shark, approximately 407 and 428 tonnes, in that order.

Over 85% of total catch in the fishing area were landed in African ports while none of the remaining fraction came into national ports.

### **Autonomous Region of the Azores (Div. X)**

The Azorean fishing fleet consists of about 700 vessels being all included in the polyvalent segment. Under the DCF, Azores plans to sample all the fleet segments according to the métiers selected. Every Azorean fishing, data collection and sampling activity is concentrated in the ICES Sub-area X, where vessels are committed to demersal, pelagic, deep-water, tuna and other highly migratory fishes (Table III.A.1).

The demersal and tuna fisheries have a high economical value in the Autonomous Region of the Azores. The deep-water fishery for demersals in the Azores is a multispecies and multigear fishery, where several types of hooks and lines gears are used by the local fleet. The dynamic of the demersal fishery seems to be dominated by the dynamic of the main target species, the blackspot seabream (*Pagellus bogaraveo*). However, others commercially important species are also landed and the target species seems to change seasonally according abundance, species vulnerability and market. The fishery is clearly a typical small scale one, predominating small vessels, <12m (90% of the total fleet) using mainly traditional bottom longline and several types of hand lines. The ecosystem is a seamount type with fishing operations occurring in all available areas (coastal and seamounts within the Azorean EEZ) until 1000 m depth, catching species from different assemblages, mostly on the 200-600 m strata (intermediate strata where the most commercially important species occur).

Statistical information on fish landings shows a decrease in captures in the Autonomous Region of the Azores over recent years. The average of captures landed in the region for the 90's was 16,200 tonnes, whereas the quantity landed in 2009 was 9,450 tonnes. The observed decrease is mostly due to tuna captures, which in this year were about half that of the average for the past decade.

Fishing activities in the Autonomous Region of the Azores can be divided into 4 main categories:

- (i) – a fishery targeting horse and chub mackerel which uses small vessels, normally less than 12.5m in length, and which uses purse seine nets. In 2007 this fishery represented 10% of the total fish landed, e.g.: 1155 tonnes of horse mackerel and 351 tonnes of chub mackerel;

- (ii) – a pole and net fishery which targets tuna, and is carried out between March/April and September/October, and which uses vessels that vary in length between 15 and 30m. Tuna catches are highly variable from year to year, but the 9200 t caught in 2007 represented more than 55% of the total catch. The main tuna species are: bigeye tuna (*T. obesus*) skipjack tuna (*K. pelamis*) and albacore (*T. alalunga*).
- (iii) - a fishery targeting demersal species, which uses vessels of less than 22m in length, and that uses bottom set long line and various hand-held instruments. In 2007, 4900 tonnes were landed, which represents 31% of total landings;
- (iv) - a fishery targeting swordfish using pelagic longlines. This fishery is carried out mainly between May and December, using vessels which vary between 12 and 30 m in length.

These fisheries are all inter-related, since the same vessel can carry out two or more types of fishing activity at different times of the year.

### **Autonomous Region of Madeira (CECAF 34.1.2)**

The bio-geographical conditions and geomorphology of the archipelago of Madeira, e.g. narrow (almost absent in some zones) insular shelf, oligotrophic waters and steep incline of the slope, have always imposed severe limitations on fishing, since the small biomass of the populations of the available fishing species, particularly in the neritic zone (to a depth of around 200m) forced the Madeira fishing fleet, operating mostly around the islands of Madeira, Porto Santo, Desertas and Selvagens and seamounts inside the Madeira Economic Exclusive Zone (CECAF 34.1.2), to concentrate on exploiting deepwater and/or migratory resources.

The greater relative importance in this sector belongs to the fishery of a deep-water resource *Aphanopus* spp targeting the capture of two sympatric benthopelagic species the black scabbard fish *Aphanopus carbo* Lowe, 1839 and the intermediate scabbardfish *Aphanopus intermedius* Parin, 1983. These species are captured with drifting long lines at the meso and bathypelagic zones. Also important is the fishery of the large migratory pelagic species (Tuna), captured by bait boats using pole and line. The dominant species in this group are: *Thunnus obesus* (Lowe, 1839), big eye tuna, and *Katsuwonus pelamis* (Linnaeus, 1758), skipjack tuna, among others.

On a decreasing scale of commercial importance, we find the small coastal pelagic species (locally called “ruama”), notably: *Trachurus picturatus* (Bowdich, 1825) (horse mackerel) and *Scomber colias* Gmelin, 1789 (chub or common mackerel), mostly caught by purse seiners.

Despite their small commercial importance, when compared to the species mentioned above, the demersal fish species even so have an important role in the socio-economic context of fishing in Madeira. These species, which have a high commercial value, are fished using multi-specific techniques by a number of small boats mostly operating with bottom long lines, traps and hand lines.

In general, the Madeira fisheries, from out of a total of about a hundred marine fish species unloaded in the Madeira and Porto Santo fishing peers, mostly relays in the 6 fish species

specifically mentioned above. Concerning other marine species, the captures of crustaceans are almost negligible but there is also a small, in terms of unloadings, but fairly important fishery in terms of value and fishing effort, of gastropod molluscs (limpets) carried out by small boats through scuba diving in the sub tidal zone.

### **III.B Economic variables**

#### **Baltic Sea, North Sea, Eastern Arctic, North Atlantic and NAFO areas**

##### **Mainland**

Having in mind what is established on Chapter III (Module of evaluation of the fishing sector), A (Collection of Economic Variables), 2(Disaggregation levels), point 3: *“In cases where a vessel operates in more than one supra region as defined in Appendix II, Member States shall explain in their national programme to which region the vessel is allocated.”*, the economic data related with the vessels who operates in the Mediterranean and in the WECAFC, are allocated to the Baltic Sea, North Sea, Eastern Arctic, North Atlantic and NAFO areas, supra region, because that is where they mostly operates.

#### **III.B.1 – Data acquisition**

##### **(a) Definition of variables**

Ever since the former DCR legislation entered in force, namely the provisions lay down in article 6° of Council Regulation 1543/2000, Portugal started the collection of economic data on the fishing fleet. Most of the variables were collected running an annual survey, supported by a stratified random sampling methodology.

Variables to be collected are those identified in Appendix VI of Commission Decision 2010/93/UE.

Variables such as “**Capital costs**” and “**Capital value**” will be estimated according to methodology proposed by the study N°.FISH/2005/03, “Evaluation of the capital value, investments and capital costs in the fisheries sector”.

Variables related with employment, FTE and FTH will be estimated in accordance with Study Fish/2005/14.

We should point it out that the treatment of data on income doesn’t include the value from leasing out quota or other fishing rights, because trade of fishing rights is not allowed.

##### **(b) Type of data collection**

Table III.B.3, presents a resume of different type of data collection per variable and fleet segment. National estimates will be based on census operations, such as fleet registry, sales notes or even logbooks, this for vessels larger than 10 meters, and for the purpose of collection economic variables, based on questionnaires.

### **(c) Target and frame population**

For most of the variables, excluding those where it comprehend estimates for inactive vessels, the target population and frame population are different. The criteria to distinguish between both are the annual permit to operate. Vessels included on frame population are all vessels with annual permit, regardless of the level of utilisation.

Total vessels at 1 January 2010, was about 7273 vessels, and licensing vessels during 2009 was of 4337.

### **(d) Data Sources**

Data sources used for the estimation of economic variables are logbooks, sales notes and surveys carried out following a stratified random sampling strategy. Each of those sources has as basic unit for the data collection: the vessel. Though the first two sources are census like and the last one is a sample, both relate to the same universe, i.e. the fleet registered on the 1<sup>st</sup> January of the reference year, therefore the matching of sources is assured.

Table III.B.1 lists the sources foreseen, in 2009 and 2010, for each variable as well as the method used to fix sampling dimension.

### **(e) Sampling frame and allocation scheme**

Several adjustments were made since the beginning, mainly to overcome problems of non answer rate and lack of dimension to produce reliable estimates. Small scale fisheries, as a result of the activity characteristics - polyvalent vessels, owners without organized legal account - revealed themselves as the most difficult fleet segment to obtain accurate estimates from. Portugal intends to maintain the same methodology applied until now, benefiting from the experience gained in the past. Nevertheless, in order to comply with new demands and to obtain more accurate estimates, Portugal proposed a new fishing fleet segmentation. This segmentation foresees strata for witch Portugal is collecting data for the first time. Therefore it is not possible to support clustering with statistical evidence. Nonetheless, all the strata clustered were analyzed in terms of activity and target species, in order to assure the most correct criteria was used.

Allocation of vessels that performed fishing operations in more than one supra region was made according with the criteria of days of activity. In this situation we can find:

- Long liner vessels, operating at North Atlantic but also within Other Regions;

Besides the criteria for assigning a particular vessel to a Supra Region, it was also required to define criteria to merge some of the fleet segment. All the fleet segments without enough dimensions to be run independently are in these circumstances. Statistical analysis were undertaken in order to evaluate the better strata to be clustered, always assuring the respect for the same group of gear. In this situation could be found, within length classes from 0 to 10 and 10 to 12 meters, the fleet segment operating in North Atlantic with Purse seine (VL=0010 and VL1012), polyvalent passive gears (VL1824, VL2440, VL40XX), merged with the segment of vessels operating with both passive and active gears (VL1824,VL2440), as well as demersal trawlers VL40XX, operating in *Other regions* clustered within the length class above 40 meters.

For identical reasons it was required to merge Vessels operating in Mediterranean with pots and traps, VL2440, with some fleet segments operating in North Atlantic areas, with active and passive gears.

Further information is provided in the sampling methodology, under annex V.

### **III.B.2 Estimation**

Methodology to derive final estimates from data collected running a stratified random survey is the Horvitz-Thompson Estimator.

To deal with non-responses in a first stage we are overestimating the  $n_{ij}$ . Nonetheless for each annual operation, three random samples are extracted and vessels randomly sorted. Each non-answer vessel may be on a second stage replaced by the vessel from the second sample with the same number of ordination.

### **III.B.3 Data quality evaluation**

As stated in table III.B.3, for variable estimation based on data collected under questionnaire, quality will be assured by setting the coverage rate and CV. This approach seems the most suitable, based on past experience. Cover rate allows the adaptations needed to deal with non answering problems, which are dependent of fleet segment.

Further information is provided in the sampling methodology, under annex V.

### **III.B.4 Data presentation**

Data for reference year  $n$ , collected during year  $n+1$ , will be available at the year  $n+2$ .

### **III.B.5 Regional coordination**

It is rather important that in the RCMs, member states could achieve in a common method to estimate the variable: Financial position in what concern the small scale fisheries.

### **III.B.6 Derogations and non-conformities**

Portugal previous experience in collecting economic data shows that the possibility to gather information related with the variable: Financial position – Deb/asset ratio, is very difficult, even impossible, in what concern the segment: small scale fisheries. **Portugal intends to appeal for derogation as to the presentation of estimates for that variable.**

## **Other Regions(CECAF,ICCAT,IOTC)**

### **Autonomous Region of Madeira (CECAF 34.1.2)**

In Madeira, the methodology for the collection of economic variables was first implemented in 2004 through the realisation of direct inquiries aiming to cover (with a random stratified design) a minimum of 15% of active fishing vessels, from the Universe of fishing boats registered in Madeira, in an annual basis.

In accordance with the dispositions of the Commission Decision (Chapter III, A.1.(1), of the Commission Decision 2010/93/UE) economic variables will be collected in an annual basis, except in what concerns the transversal variables. The population considered comprises all vessels registered.

A new strategy of sampling will be applied in the collection of data from Madeira from 2011 onwards, regarding the collection of data from active vessels from 2010 onwards, to obtain the economic variables that can not be obtained directly from solid data sources like fleet register or sales notes. To all these active vessels an official questionnaire from the Madeira Fisheries Directorate will be delivered by registered mail. This questionnaire is based in the model used by DGPA at the National level. The variables necessary to collect for the inactive vessels will be obtained directly from the fleet register.

### **III.B.1 Data acquisition**

#### **(a) Definition of variables**

Economic variables to collect are listed in Table III.B.3., following the model and strategy defined at the National level by the coordination (DGPA), designed to achieve an estimative of the economic variables defined in the Appendix VI of the Commission Decision 2010/93/UE.

#### **(b) Type of data collection**

The programme will attempt to collect data from all members of the populations, having a planned coverage with inquiries to 100% of the active vessels (Census), in each year, and will be aimed in achieving a 100% sample rate of responses in all fleet segments. Consequently, best efforts will be made to achieve the most high response rate possible. A technician will be responsible for the monitoring of the reception of responses and to make personal contacts with the owners of the vessels not responding in due time.

#### **(c) Target and frame population**

Concerning the Madeira fleet target and frame population will be the same, comprising, in each of the reference DCF years, all the active vessels registered in Madeira as shown in Table III.B.1. which lists the population of the Madeira fleet segments, selected according to Appendix III, of the Commission Decision 2010/93/UE, indicating the Universe to be sampled.

From the total of 466 vessels registered in Madeira, 112 active vessels were distributed by the fleet segments. Each vessel was allocated to a specific segment using the dominance criterion described in Chapter III.A.2.(2), after individual evaluation of the annual fishing days spend with each fishing gear (from logbooks, sales notes and inquiries).

In Table III. B. 2, it is referred the clustering of some fleet segments, which have a total number of vessels less than 10 units, which are linked to the major segment using the same fishing gear. In the particular case of the purse seiners, although the number of vessels is 3 due to the specificity of their fishing gear, that is the only mobile gear used by the Madeira fishing fleet, we used the criteria of not merge it with any segment of the remaining fleet and to use an exhaustive sampling strategy.

### **(c) Data sources**

There is only one data source for each type of variable. The data source selected was the most reliable existent (for example: sales notes in the case of values of landings, or the register fleet for all data related with the characteristics of fishing vessels) and when no such reliable data source exists, a questionnaire is made to the boat owners.

### **III.B.2 Estimation**

In the case of Madeira, the sets of data collected in this Module will be sent to the National coordinator (DGPA) and final estimates of the economic variables for the population will be done at a National level following the estimations methods used by that Institution.

### **III.B.3 Data quality evaluation**

As stated in table III.B.3, for variable estimation based on data collected under questionnaire, quality of data may be biased due to poor response rate obtained. As already mentioned in section III.B.1 (b), efforts will be made to ensure the most high response rate possible and in the validation of the responses to the questionnaires. New contacts will be made with the vessel owners to confirm doubtful responses. Variability will be assessed through the computation of the Coefficient of Variation of the estimates done.

### **III.B.4 Data presentation**

In each collecting year raw data from the reference year is usually only completely available to the programme by the end of the second quarter of the year, due to accounting issues. Adding the time for the input of data and make the estimative of the variables, probably, final data from each reference year will be available to end users by the end of the collection year.

In the case of Madeira clustering due to confidentiality issues was already described in point III.B.1.(c) of NP.

### **III.B.5 Regional coordination**

See what have been said for the Mailand fleet.

### **III.B.6 Derogations and non-conformities**

See what have been said for the Mailand fleet.

### **III.C Biological metier related variables**

IPIMAR is responsible to collect and analyse the biological data from ICES Division IXa, Sub areas XII, XIV and I, II, NAFO area and the long-line fleet targeting swordfish (ICCAT)

#### **III.C.1. Data acquisition**

##### **North Atlantic (ICES areas V-XIV and NAFO areas)**

##### **(a) Codification and naming convention**

##### **Mainland**

For metier identification it was used the rules presented in Commission Decision 2010/93/UE (Appendix IV) and the recommendations of the RCMs.

##### **Autonomous Region of the Azores (Div. X)**

The Azorean métiers were defined using a combination of analysis to gear/landings compositions and vessel lengths, mainly for vessels under 10 meters. For vessels greater than 10 meters, a combination of logbook data and analysis to gear/landings compositions was used to define the métier associated to the trip. For the Azorean landings trips is not required the gear(s) information, for this reason was necessary to create a method to define the main gear represented in each landing trip. For each fishing trip the species landed weights were allocated to a species category (small pelagic, bethopelagic species, demersal slope species, deep water species, coastal demersal species, large pelagic species, coastal pelagic species, tunas species and crustacean species). However for some highly specific fishing gears were detected some target species highly representative that were taken into account (squid, red mullet, parrot fish and rainbow wrasse). Fishing trips were subsequently assigned to 9 gears types based on the following species compositions rules and in some cases vessels lengths:

##### **Set longline gear (LLS)**

a) Set longline gear: vessel length > 10m and number of species  $\geq 7$  and bentopelagic species + demersal slope species + deep water species > other species. However if the total catch is inferior to 120kg is consider hand line gear

b) Set longline gear: vessel length < 10m and number of species > 5 and bentopelagic species + demersal slope species + coastal demersal species + deep water species > other species

##### **Hook-and-line gear (LHM)**

a) Hook-and-line gear: vessel length >10m and number of species < 7 and bentopelagic species + demersal slope species + coastal demersal species + deep water species > other species

b) Hook-and-line gear: vessel length <10m and number of species ≤ 5 and bentopelagic species + coastal demersal species > other species

Squid jigging gear (LHM)

Squid jigging gear: squid > other species

Drift longline gear (LLD)

Drift longline gear: If large pelagic species > other species

Fish trap gear (FPO)

Fish trap gear: If red mullet exist and in conjugation with muraena eels, red porgy, axillary seabream, octopus, gastropods and red scorpion fish > other species

Crustaceans trap gear (FPO)

Crustaceans trap gear: If exist crustaceans and in conjugation with octopus, red scorpion fish and gastropods > other species

Gill net gear (GNS)

Gill net gear: If exist parrot fish and in conjugation with coastal pelagic species > other species

Pole line gear (LHP)

Pole line gear: If tunas species + coastal pelagic species > other species

Purse seine gear for small pelagic species (PS\_)

Lift net gear for small pelagic species: small pelagics species > other species

This procedure was conducted for the years 2007 and 2008. The selection of target species was achieved according to the following:

<b>Gear type</b>	<b>Target assemblage</b>	<b>Examples of Species / Group of species</b>
FPO	CRU	shrimp, lobster, mediterranean slipper lobster
FPO	FIF	striped red mullet
GNS	FIF	parrotfish, white seabream, ballan wrasse
LHM	MCF	squid
LHM	FIF	wreckfish, blackspot seabream
LHP	FIF	tuna, common dolphin fish
LLD	LPF	swordfish, blue shark
LLS	DEF	blackspot seabream, alfonso, blackbelly rosefish, forkbeard

PS	SPF	horse mackerel, chub mackerel, sardine
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This classification resulted in a total of 7 different gear types (Level 4 in the matrix), and 9 different target species assemblages (Level 5 of the matrix).

Concerning the number of days of each fishing trip, some difficulties were encountered for the fleet segment less than 10 meters, since inquiries are not available for all of them (79% of the regional fleet), neither for all trips and this segment is not required to fulfil logbooks. Consequently, some criteria were adopted in order to assign fishing effort (days) to each trip.

Since both FPO and GNS are passive gears, mainly used by vessels with less than 10 meters, which operates in the coastal fishing grounds where oceanic platform still permits these fishing operations, 1 fishing day was attributed to each trip. As for LHM fishing for squid, 1 day trips were also assigned to this metier.

Concerning LHM fishing for finfish species, several boats stay at sea for more than one day, as it can be concluded from the inquiries made. The number of days by fishing trip was considered to be between 1 to 3 days for vessels under 10 meters, based on the analysis of the landings sheets.

For vessels less than 10 meters and fishing for tuna using LHP, 1 day by fishing trip was recognized once they basically have daily landings.

In the longline fishing for large pelagic fishes concerning vessels less than 10 meters length a similar approach to the one used for LHM-FIF was applied.

For bottom longline the criteria established required an intense analysis of the fishing effort inquiries available, since vessels of this fleet segment (VL0010) can stay out at sea for several days, since several of them have made improvements on the boats (such as adding a cabin) and equipment, as well as new vessels with better accommodation conditions entered in the fleet. Concerning all these aspects, the fishing days for this metier could be estimated from 1 day at sea to the maximum of 5 days considering the volume of fish landed

#### **(b) Selection of metiers to sample**

##### **Mainland**

In Div IXa, the data used to select the metiers to be included in the sampling programme was the logbooks data from 2007-2008, for vessels equal or larger than 12 meters OAL. For vessels less than 12 meters it was used the landings (using sales notes) when it was possible to identify the species assemblage with the used gear in each trip.

In the first case (vessels  $\geq 12$  m OAL) the selected ranking was validated with the trip landings by species obtained from sales notes.

Additionally to the metiers selected by the ranking algorithm defined on the DCF, the metier "longliners targeting demersal species" (LLS\_DEF\_0\_0\_0) was also selected to Div. IXa. This metier targets largest individuals than the other metiers, which are particularly relevant in the case of hake, subject to a recovery plan, and monkfish, also considered outside safe biological limits by ICES. The sizes caught by this metier have a large contribution to the

estimates of SSB (maturity ogive) and their absence from catch-at-age matrices can bias this parameter.

In ICES sub-areas XII and XIV and NAFO 1J, 1F and NAFO 3LMNO it was used the logbook data (2007-2008) to select the metiers.

In the table below is presented the list of *metiers* included and not included in the 90% of the ranking system, obtained from the logbook data, in Mainland (Div. IXa):

List of Metiers included (shaded area) and not included in the 90% ranking system (vessels with OAL length $\geq$ 12m) Mainland-Div IXa

Catch				Value				Days at sea			
métier	Kilos	% of the total	Ranking 90%	métier	Euros	% of the total	Ranking 90%	métier	no. Days	% of the total	Ranking 90%
PS_SPF_>=16_0_0	54108646	54,9%	55%	PS_SPF_>=16_0_0	56119966	48,9%	49%	PS_SPF_>=16_0_0	13616	14,1%	14%
OTB_CRU_>=70_0_0	11300188	11,5%	66%	OTB_CRU_>=70_0_0	19017301	16,6%	65%	GTR_DEF_>=100_0_0	13546	14,1%	28%
OTB_DEF_65-69_0_0	11156708	11,3%	78%	GTR_DEF_>=100_0_0	12601267	11,0%	76%	FPO_MOL_>=29_0_0	11567	12,0%	40%
LLD_LPF_0_0_0	5216650	5,3%	83%	OTB_DEF_65-69_0_0	6975615	6,1%	83%	OTB_DEF_65-69_0_0	9268	9,6%	50%
LLS_DWS_0_0_0	3528156	3,6%	87%	LLS_DWS_0_0_0	4223861	3,7%	86%	OTB_CRU_>=70_0_0	8574	8,9%	59%
OTM_SPF_90-100_0_0	3189666	3,2%	90%	LLS_DEF_0_0_0	3625526	3,2%	89%	LLD_LPF_0_0_0	7251	7,5%	66%
GTR_DEF_>=100_0_0	2511004	2,5%	92%	LLD_LPF_0_0_0	3011929	2,6%	92%	GNS_DEF_80-99_0_0	5707	5,9%	72%
FPO_MOL_>=29_0_0	1733569	1,8%	94%	OTB_CRU_55-59_0_0	2252238	2,0%	94%	LLS_DWS_0_0_0	5494	5,7%	78%
LLS_DEF_0_0_0	1255624	1,3%	95%	GNS_DEF_80-99_0_0	1512285	1,3%	95%	OTB_CRU_55-59_0_0	4131	4,3%	82%
GNS_DEF_80-99_0_0	1086740	1,1%	96%	DRB_MOL_30_0_0	1210343	1,1%	96%	DRB_MOL_30_0_0	3906	4,1%	87%
FPO_FIF_>=29_0_0	752430	0,8%	97%	FPO_CRU_8-29_0_0	947298	0,8%	97%	LLS_DEF_0_0_0	3096	3,2%	91%
OTB_CRU_55-59_0_0	731956	0,7%	98%	GNS_DEF_60-79_0_0	791122	0,7%	98%	GNS_DEF_60-79_0_0	2028	2,1%	94%
DRB_MOL_30_0_0	591540	0,6%	99%	PS_SPF_>=8_0_0	759223	0,7%	99%	GNS_DEF_>=100_0_0	980	1,0%	94%
GNS_DEF_60-79_0_0	411366	0,4%	99%	GTR_DEF_80-99_0_0	501478	0,4%	99%	OTM_SPF_90-100_0_0	734	0,8%	93%
LHM_FIF_0_0_0	357213	0,4%	99%	FPO_MOL_>=29_0_0	426647	0,4%	99%	GTR_DEF_80-99_0_0	657	0,7%	94%
PS_SPF_>=8_0_0	216049	0,2%	100%	LHM_FIF_0_0_0	229860	0,2%	100%	FPO_CRU_>=29_0_0	537	0,6%	95%
GNS_DEF_>=100_0_0	181064	0,2%	100%	GNS_DEF_>=100_0_0	224864	0,2%	100%	LHM_FIF_0_0_0	332	0,3%	95%
GTR_DEF_80-99_0_0	152085	0,2%	100%	LHM_CEP_0_0_0	173590	0,2%	100%	TBB_CRU_>=20_0_0	237	0,2%	95%
FPO_CRU_>=29_0_0	36271	0,0%	100%	GNS_DEF_50-59_0_0	46124	0,0%	100%	LHM_CEP_0_0_0	218	0,2%	95%
LHM_CEP_0_0_0	23066	0,0%	100%	FPO_CRU_>=29_0_0	31690	0,0%	100%	GNS_DEF_50-59_0_0	100	0,1%	96%
LTL_LPF_0_0_0	18078	0,0%	100%	GTR_DEF_>=70_0_0	18115	0,0%	100%	PS_SPF_>=8_0_0	70	0,1%	96%
GNS_DEF_50-59_0_0	8100	0,0%	100%	TBB_CRU_>=20_0_0	9478	0,0%	100%	LTL_LPF_0_0_0	45	0,0%	96%
TBB_CRU_>=20_0_0	6415	0,0%	100%	OTM_SPF_90-100_0_0	7869	0,0%	100%	GTR_DEF_70-79_0_0	23	0,0%	96%
GTR_DEF_>=70_0_0	3072	0,0%	100%	LTL_LPF_0_0_0	580	0,0%	100%	GTR_DEF_>=35_0_0	3	0,0%	96%

The final list of selected metiers is presented in Table III.C.1. In this list it was also included the metier FYC\_CAT\_>=20\_0\_0 that target eels, which are considered a priority species by the Commission.

The metier DRB\_MOL\_30\_0\_0 catches exclusively clams; it is a small fleet targeting species of priority 3. This metier will be not sampled due to the high costs required.

The following table describes by metier the target assemblage and their representative species or group of species in Div IXa:

Métier	Target assemblage	Examples of target Species / Group of species	Geographical area
FPO_MOL_>=29_0_0	Cephalopods	<i>Octopus vulgaris</i> or fish (depending only of the type and size of the trap)	IXa
GNS_DEF_>=100_0_0	Demersal fish	<i>Lophius spp.</i> , <i>Merluccius merluccius</i> , etc	IXa
DRB_MOL_30_0_0	Clams	<i>Ensis spp.</i> , <i>Spisula solida</i> , <i>Donax spp.</i> , etc	IXa
GNS_DEF_60-79_0_0	Demersal fish	<i>Trisopterus luscus</i>	IXa - North
GNS_DEF_80-99_0_0	Demersal fish	<i>Pagellus acarne</i> and other <i>Sparidae</i>	IXa
GTR_DEF_>=100_0_0	Demersal fish	<i>Lophius spp.</i> , <i>Merluccius merluccius</i> , etc	IXa
GTR_DEF_80_99_0	Demersal fish	<i>Sepia officinalis</i> , <i>Solea spp.</i> , <i>Rajidae</i>	IXa
LLD_LPF_0_0_0	Large Pelagic Fish	<i>Xiphias gladius</i>	IXa
LLS_DEF_0_0_0	Demersal fish	<i>Merluccius merluccius</i>	IXa-South
LLS_DWS_0_0_0	Deep sea fish	<i>Aphanopus carbo</i> , <i>Centroscymnus coelolepsis</i> , <i>Centrophorus squamosus</i>	IXa - southwest
OTB_CRU_>=70_0_0	Crustacean	<i>Nephrops norvegicus</i>	IXa - southwest
OTB_CRU_55-59_0_0	Crustacean	<i>Parapenaeus longirostris</i>	IXa - southwest
OTB_DEF_65-69_0_0	Demersal fish	<i>Merluccius merluccius</i> , <i>Trachurus spp.</i> , <i>Lophius spp.</i>	IXa
PS_SPF_>=16_0_0	Small Pelagic fish	<i>Sardina pilchardus</i> , <i>trachurus spp.</i> , <i>scombrus japonicus</i>	IXa
TBB_CRU_>=20_0_0	Crustacean	<i>Palaemonidae</i>	IXa - North
FYC_CAT_>=20_0_0	Catadromous species	<i>Anguilla anguilla</i>	IXa

The table below describes by metier the target assemblage and their representative species or group of species caught by the long distance Portuguese fleet operating in ICES Div XII, XIV and NAFO areas:

Métier	Target assemblage	Examples of target Species / Group of species	Geographical area
OTM_DEF_100_129_0_0	Demersal Fish	<i>Sebastes spp.</i>	ICESXIV, XII, NAFO 1F,2J
OTB_MDD_130-219_0_0	Mixed Demersal and Deep water species	<i>Sebastes spp.</i> , <i>Reinhardtius hippoglossoides</i> , <i>Raja spp.</i> , <i>Hippoglossoides platessoides</i> , <i>Limanda ferruginea</i>	NAFO Subarea 3

### Autonomous Region of the Azores (Div. X)

As 2009 data was not completely available, 2007 and 2008 were used as reference years. Sales notes from 2007 and 2008 were used for volume and value information, although for fishing effort the available inquiries, logbook information as well as the sensitive classification were used. The selection of the metiers to be sampled was achieved following

the ranking system described in the Commission Decision 2010/93/UE, Chapter III B.B1.3.(1)(b) and it is presented in table III.C.1.

A short description of the five selected métiers is presented.

*Gill nets* (GNS-FIF) – this fishery occurred in inshore areas with a marked seasonality (fishing effort and catch concentrated during the summer months). In this métier were detected in active operation an average of 113 vessels per year. This passive gear tends to gill the fish in the netting which tend to be single panel (gill nets). According to their designed these nets can be used on the surface using buoyancy targeting mainly coastal pelagic species (e.g. yellowmouth barracuda, jacks, atlantic bonito) or using ballasting to fish on the bottom targeting the coastal demersal assemblage, especially the parrot fish, however in Azores the depth of operation together to the net design allow commonly to catch simultaneously coastal demersal and coastal pelagic assemblages. This métier present a high by-catch of costal demersal species.

Hook-and-line gear (LHM-FIF) – Hook-and-lines fishery in Azores occurred in inshore areas and offshore banks all year round. In this métier were detected in active operation an average of 624 vessels per year. The gear is often supported by manual drums. The gear design can differ in line material (e.g nylon, wire metal), number of hooks (2 to 50), disposition of the hooks, type of bait and optionally the use of chum. These variations depend on the target specie(s) whereas in inshore areas are commonly coastal demersal species (e.g. red porgy, forkbeard, blacktail comber) while in the slope of the islands and offshore banks are mainly the benthopelagic assemblage, especially the blackspot seabream.

*Squid jigging gear* (LHM-MCF) – Squid fishery occurred in the slope of the islands, all year round although with a decreasing of effort and catch during the summer months. In this métier were detected in active operation an average of 300 vessels per year. Squid jigging gear in Azores is performed by hand line, using a metal wire with several artificial lures. The line is given a jerky up-and-down movement which attracts the squid to the jig. The fishing is frequently worked non-mechanically but usually with an auxiliary manual drums, being highly selective for the target species *Loligo forbesis* and associated to low by-catch and discards.

*Set longline gear* (LLS-DEF) – This gear since 2001 were banned from the 3 nautical miles of the coast islands, consequently the effort is distributed in the slope and offshore banks during all year round. In this métier were detected in active operation an average of 228 vessels per year. The traditional Azorean set longline consists of a main-rope set horizontally near the bottom, sometimes with a considerable length, which is linked to a main-line intercalate with buoys and stones. The branch-lines are fixed at regular intervals to the main-line with hooks and bait, targeting a high variety of assemblages as benthopelagic species (e.g blackspot seabream), demersals species (e.g bluemouth) and in some cases deep water species (e.g black scabbardfish). This gear is also used with some design variations in the disposition/proportion of buoys and stones consequently targeting more demersal species or benthopelagic species, or also switching the material of the main-line, from nylon monofilament to strong multifilament and additionally using larger size hooks, targeting the wreckfish. Other variation are the vertical set longlines that can be one to several vertical sets usually linked to each others with a high quantity of hooks targeting the benthopelagic assemblage especially the blackspot seabream.

This métier consists in one of the most well equipped métier of the Azorean fishing fleet in what concerns to vessel habitability conditions in order to take one extra person on board.

This way, the allocation of sampling trips was first carried out for at-sea observer scheme to optimize the design to meet, as far as possible, the DCF precision targets for quarterly discard estimation. The at-sea observer program conducted by DOP/UAc collects data on both species and length composition of all retained and discarded components on a haul basis and therefore provides Scheme 1 concurrent sampling of Group1-3 species. Data from observer trips carried out in Azores EEZ in 2007 and 2008 indicated average discard rates (by weight) in excess of 10% for this particular métier. Since it consists on a multispecies fishery, more than 75 different species of fishes, molluscs and crustaceans were already identified.

*Pole line* (LHP-FIF) - this fishery occurred in inshore and offshore areas, characterized by a marked seasonal pattern (fishing effort and catches mainly concentrated during the summer months). In this métier were detected in active operation an average of 243 vessels per year. This fishery is defined by the pole line using live bait and less often artificial lures. The vessels of higher dimension tend to target exclusively tuna species (e.g skipjack, big eye) while small vessels target coastal pelagic species (e.g yellowmouth barracuda, jacks, bluefish) as well as tuna species.

*Lift nets* (PS\_-SPF) – this fishery occurred mainly in inshore areas all year round. In this métier were detected in active operation an average of 272 vessels per year. This fishery consisting of a horizontal netting panel or a bag shaped usually like a parallelepiped with opening facing upwards. After being submersed at the required depth, the fish are attracted by light or bait (chum) being the nets lift out of the water by hand from a boat. The target species is the horse mackerel however with some by catch (e.g chub mackerel, sardine, bogue).

### **(c) Type of Data collection**

#### **Mainland**

For the métiers and stocks under the responsibility of IPIMAR it was defined the expected sampled trips (Table III.C.3 ).

The programme for 2011-2013 was designed taking into account the more recent updates on the DCF and keep continuity with the 2009-2010 programme, in order to maintain stability with previous methodologies and operational procedures.

So, for 2009-2010 programme, in order to define the total sampling effort in number of trips, concurrent-at-market, a small simulation study was carried out to define the percentage of trips that should be sampled per year. Details of the simulation study and the R code used can be found in <http://pnab.ipimar.pt/doku.php?id=dc:prop:sim0910>.

For the current programme the same sampling effort was kept in order to stabilize the sampling programme. An update of the simulation study referred above will be carried out in 2013 with the 5 years of sampling under this system to validate results and apply for following years.

In order to allocate the sampling effort for the métiers, concurrent-at-sea, it was used the preceding methodology and experience obtained in the previous sampling programme for discards (Table III.C.4).

In the trawl, long-lines and nets fleets, the observer teams will be working with two persons in each team. A single observer will be used in the purse-seine fleet.

In the long line for deep sea fish 12 trips will be sampled per year from vessels of two ports (Peniche e Sesimbra)

As far as purse seine fishing is concerned, the aim is also to cover the seasonality of fishing and the entire coast. Thus in the first semester one trip (one and a half days each) will be sampled per month, randomly taken from one vessel from each of the three most important coastal ports (Matosinhos, Peniche and Portimão), while in the second semester three trips will be sampled per month randomly selecting among the vessels from the above-mentioned ports. A total of 24 trips will be sampled per year.

The Neyman Allocation indicated that it will be sampled 12 trips per year for the Bottom Trawl Crustacean fleet and 27 trips/year for Bottom Trawl Fish fleet.

For trammel nets fleet it will be sampled 12 trips per year.

No catch and discard sampling is programmed for the long line vessels for demersal fish because at the present it is very difficult to have available vessels that allow on board the sampling team.

For the trawl, nets, long line and purse seine fleets the sampling procedures are very similar. In each sampled haul estimates are made of the total catch and of the discards. A sub-sample of two fish boxes (about 60 Kg) of the catch and the discards (2 boxes) are taken. Information on length, age, sex and maturity is recorded (when possible). For the purse seine fleet special attention is given to the record of the slipping.

A total of 13 distant-water fishing trawlers operate in NAFO, Sub area 3, and ICES Div. XIVb+XII and Div.IIa,b in 2008. Since 1995 the crew male nurses were trained to carry out sampling during the trip (NAFO-Subcontracting costs).

For this fleet it is programmed to sample 5 trips per year (1 trip in Sub areas XII, XIV,NAFO 1J, 2F and 4 trips in NAFO 3LMNO area).

The NAFO observers collect, per haul, samples to obtain estimates of catches and discards of the species mentioned in Appendix VII.

The sampling programme targets the full catch in the case of sampling at-sea or the full landings in the case of market sampling. Such approaches fit into scheme 1. In cases of operational constraints, scheme 2 is applied and the percentage of species to roll between any two samples must be sorted out in a case-by-case basis, once that it depends on several external factors like fleet, season, region, etc.

The allocation of resources to market sampling and at-sea sampling do not influence each other, once that these are organized independently following the yearly planning, which are based on the statistical analysis performed (see above) and the rules set by the regulation.

#### **Autonomous Region of the Azores (Div. X)**

The sampling strategy at markets will be conducted, for all the metiers selected, in 4 islands with a total of 6 fishing harbours. All fishery sampling in Azores (observer trips and shore-based sampling) is carried out by the Department of Oceanography and Fisheries contracted staff. The observer trips for discards purposes (length distribution and volume of discards) will carry out by two observers. They will conduct quarterly sampling for hand lines and set longlines during 12 months a year, although more 24 days at sea are scheduled for two other technicians, to support discard sampling of hand lines metier.

Probability sample survey, in which the data are collected from randomly selected units of the population, is the type of data collection to be applied for the collection of biological metier-related variables. A random stratified sampling plan with coverage of 2% of the trips in each metier selected for sampling will be applied. In cases where for a given metier, 2% of the population is not a significant number to be sampled, a minimum of 20 trips will be assured, in order to obtain a representative sample.

In terms of sampling strategy, the concurrent sampling will be applied with sampling scheme 1. For set longlines, sometimes many species occur, and sampling scheme 2 will be adopted, with sampling of group 1 species guaranteed and also half of group 2 and 3 species. In general, the value of x will be set at a relatively high value.

The Azores at-sea observer scheme collects comprehensive data on species composition and length composition of all retained and discarded components on a haul-by-haul basis, and therefore provides Scheme 1 concurrent sampling of Group 1 – 3 species. Landings from vessels with an observer on board, in specific trips will be sampled by the sampling technicians present at the landing harbour.

#### **(d) Target and frame population**

##### **Mainland**

The sampling programme considers the sampling frame to be the same as the population. Note that it is not possible in advance to know how many trips will be executed in a specific year and sampling effort is computed from historical records, with the expectation that the activity of the fleet will be similar.

##### **Autonomous Region of the Azores (Div. X)**

The target population is the total number of fishing trips, of a given metier, in a given time period, in Azores fishing ground. The appropriate sampling frame and stratification scheme to provide the required data for the metiers selected for sampling, is presented in Table III.C.4. Success in attaining discard and market sampling targets depends critically on the goodwill of the fishing industry, weather and other uncontrollable factors.

#### **(e) Sampling stratification and allocation scheme**

##### **Mainland**

The sampling stratification and allocation schemes follow the regulation rules. In the case of FYC\_CAT\_>=20\_0\_0 that target eels, although the metier was not selected by the DCF rules it was included on the sampling programme due to doubts about the stock status and short information available. Regarding DRB\_MOL\_30\_0\_0 that targets Clams with dredges, although it was selected by the DCF rules, the costs of collecting this information is too high for a species of group 3.

Table III.C.5 shows the sampling intensity for length composition and for all metiers combined.

In the 2009-2010 programme was included a pilot study directed to eel (Pilot study for Eel). In the present programme the sampling for length composition of the eel was routinely included.

In Annex II it is presented two pilot studies named “Pilot Study on the metiers where skates are caught in IXa” and “Pilot study for glass eel (*Anguilla anguilla*), 2011-2013”.

### **Autonomous Region of the Azores (Div. X)**

Sampling effort presented in Table III.C.4 is proportional to the relative effort (number of fishing trips) and variability of the metiers. The levels presented in Table III.C.4 have been calculated on the basis of an analysis of the number of samples and number of measurements per sample that are needed to attain the specified precision targets.

For ICES Division X (Azores fishing ground) there are no planned targets and requirements for regional length measurements for all metiers combined. Planned targets and requirements for national length measurements are presented in Table III.C.5.

### **North Sea & Eastern Arctic (ICES areas I,II)**

In Table III.C.1 are presented the metiers selected for the Supra region Eastern Arctic (ICES sub areas I and II). The fleet operating in these sub areas also operate in NAFO area. In its under way to NAFO area catch demersal and pelagic fish (redfish) in sub areas I and II. To select the metiers it was used the logbooks data for the period 2007-2008.

#### **(a) Codification and naming convention**

##### **Mainland**

For metier identification it was used the rules presented in Commission Decision 2010/93/UE (Appendix IV) and the recommendations of the RCMs.

#### **(b) Selection of metiers to sample**

##### **Mainland**

In ICES sub-areas I and II it was used the logbook data (2007-2008) to select the metiers.

The next text table describes by metier the target assemblage and their representative species or group of species caught by the long distance Portuguese fleet operating in ICES Div I and II.

Métier	Target assemblage	Examples of target Species / Group of species	Geographical area
OTB_DEF_>=120_0_0	Demersal Fish	<i>Gadus morhua</i> , <i>Melanogrammus aeglefinus</i> , <i>Sebastes mentella</i> , <i>Anarhichas spp.</i>	ICES I, II
OTM_DEF_100-119_0_0	Demersal Fish	<i>Sebastes spp.</i>	ICES I, II

(c) **Type of Data collection**

**Mainland**

For the metiers and stocks under the responsibility of IPIMAR it was defined the expected sampled trips (Table III.C.3 ).

A total of 13 distant-water fishing trawlers operate in NAFO, Sub area 3, and ICES Div. XIVb+XII and Div.IIa,b in 2008. Since 1995 the crew male nurses were trained to carry out sampling during the trip.

For this fleet it is programmed to sample 3 trips per year. For each haul, observers collect samples to estimate catches and discards of the species mentioned in Appendix VII. Due to operational constrains, scheme 2 is applied.

(d) **Target and frame population**

**Mainland**

The sampling programme considers the sampling frame to be the same as the population. Note that it is not possible in advance to know how many trips will be executed in a specific year and sampling effort is computed from historical records, with the expectation that the activity of the fleet will be similar.

(e) **Sampling stratification and allocation scheme**

**Mainland**

The sampling stratification and allocation schemes follow the regulation rules. Table III.C.5 shows the sampling intensity for length composition and for all metiers combined.

**Other Regions (CECAF, ICCAT, IOTC)**

(a) **Codification and naming convention**

**Mainland**

For metier identification it was used the rules presented in Commission Decision 2010/93/UE (Appendix IV) and the recommendations of the RCMs.

### **Autonomous Region of the Azores (ICCAT)**

All the mentions about the codification and naming convention of the ICCAT region for Autonomous Region of the Azores are already included on the text in the heading *North Atlantic (ICES areas V-XIV and NAFO areas)* – (a) *Codification and naming convention*, namely, the paragraphs about the metiers *Pole line gear* (LHP) and *Drift longline gear* (LLD).

### **Autonomous Region of Madeira (CECAF 34.1.2)**

In the case of Madeira, taking in account the geographic situation of this archipelago Appendix IV(5) (Matrix: Other Regions) was used concerning the codification and naming convention used for the each gear type and target assemblages identified in the Madeira fisheries sector which are described in the following table:

<b>Gear type (Level 4 of Matrix)</b>	<b>Target assemblage (Level 5 of Matrix)</b>	<b>Examples of Species / Group of species</b>
Drifting longlines (LLD)	Deepwater species (DWF)	Black scabbard fish (see <b>III C 6</b> )
Purse seine net (PS)	Small pelagic fish (SPF)	Horse mackerel, chub mackerel, bogues and sardines
Set longlines (LLS)	Finfish (FIF)	Various demersal species
Pole Handline (LHP)	Large pelagic Fish (LPF)	Tuna
Misc	Molluscs (MOL)	Limpets (see <b>IIIC6</b> )
Handlines (LHM)	Large pelagic fish (LPF)	Tuna
Handlines (LHM)	Finfish (FIF)	Various demersal fish species
Fishing pots and traps (FPO)	Finfish (FIF)	Various demersal fish species and crustaceans
Set longlines (LLS)	Small pelagic fish (SPF)	Horse mackerel, chub mackerel (see <b>IIIC6</b> )

<b>Gear type (Level 4 of Matrix)</b>	<b>Target assemblage (Level 5 of Matrix)</b>	<b>Examples of Species / Group of species</b>
Handlines (LHM)	Small pelagic fish (SPF)	Horse mackerel, chub mackerel (see <b>IIIC6</b> )
Misc	Finfish (FIF)	Various demersal fish species

**(b) Selection of métiers to sample**

**Mainland**

For other regions, namely ICCAT and IOTC, fisheries are operated by the mainland Portuguese fleets and the target species is *Xiphias gladius*, the gear group is drifting longlines. So, the métier selected was LLD\_LPF\_0\_0\_0.

**Autonomous Region of the Azores (ICCAT)**

The selection of the métiers to be sampled was achieved following the ranking system described in the Commission Decision 2010/93/UE, Chapter III B.B1.3.(1)(b) and it is presented in table III.C.1.

A short description of the selected métier is presented.

*Pole line* (LHP-FIF) - this fishery occurred in inshore and offshore areas, characterized by a marked seasonal pattern (fishing effort and catches mainly concentrated during the summer months). In this métier were detected in active operation an average of 243 vessels per year. This fishery is defined by the pole line using live bait and less often artificial lures. The vessels of higher dimension tend to target exclusively tuna species (e.g skipjack, big eye) while small vessels target coastal pelagic species (e.g yellowmouth barracuda, jacks, bluefish) as well as tuna species.

**Autonomous Region of Madeira (CECAF 34.1.2)**

Procedures to assign each individual fishing trip to a specific métier were conducted using the following methodology:

For vessels less than 10 meters two main sources of information were used; for the fishing trips where information based on inquiries was available, the métier was assigned after their evaluation. In most of the cases, landings were evaluated concerning the species, obtained from sales notes, which permitted to allocate a specific métier to each one of them; Information contained on logbooks, and in some cases the evaluation of the landings, obtained from sales notes, for vessels over 10 meters, was used for assigning each fishing trip to a métier. Table IIIC1 provides a list of the métiers identified in this process. Métiers identified but that will not be sampled are highlighted in grey in the above mentioned table.

Métiers were selected for sampling according to the methodology described in Chapter IIIB.B1.3.(1)(b). A ranking procedure until reaching 90% of landings was made. Similar exercises for ranking were then used with values and fishing effort (days at sea). The métiers were cumulatively selected in each process.

This classification resulted in a total of 6 different gear types (Level 4 in the matrix), and 5 different target species assemblages (Level 5 of the matrix).

#### LLD\_DWF\_0\_0\_0

This métier comprises the very specialized Madeira fishery of the black scabbard fish (*Aphanopus* spp), exclusively performed with drifting longlines (LLD, see **IIIC6**), set at the water column between 800-1300 m deep. Catches of this metier are strongly based in the targeted species of black scabbard fish which usually composes 85-98% of the total catches. The fishery is mostly developed inside the Madeira Exclusive Economic Zone, included in the CECAF 34.1.2. area, all year round. Sporadically fishing sets are made, by the vessels with superior autonomy, in the vicinity of the Madeira EEZ.

#### LHP\_LPF\_0\_0\_0

This metier comprises the Madeira fishery of large pelagic fishes (LPF) namely tuna species, mostly *Thunnus obesus* (bigeye tuna) and *Katsuwonus pelamis* (skipjack). The fishery is made by vessels using pole and line (LHP) with live bait and is mostly developed inside the Madeira Exclusive Economic Zone, included in the CECAF 34.1.2. area. This fishery is seasonal operating mostly during the second and third quarters of the year.

#### PS\_SPF\_16\_0\_0

This metier comprises the fishery of small coastal pelagic fishes (SPF), locally called ruama, mostly horse mackerel (*Trachurus picturatus*) and chub or common mackerel (*Scomber colias*=*Scomber japonicus*). This fishery uses a purse seine net, with light attraction (PS). Nets have a legal mesh size of 16 mm. This metier, from 2009 onwards, is comprised by only 3 vessels of the 18-24 m segment operating all year round.

#### LLS\_FIF\_0\_0\_0

This metier comprises a multispecific fishery, developed with bottom longlines (LLS), targeting a large number of demersal species (FIF) with high commercial value (peixe fino). This fishery is operated all year round mostly by small vessels (<10 m) in the insular shelf.

#### MISC\_MOL\_0\_0\_0

This metier (see **IIIC6**) is the principal occupation of 8 small vessels (>10 m) and 1 (10-12 m) segments. These species are caught in the intertidal zone by scuba divers with hand devices (lapeiras), specifically targeting two species of limpets (*Patella aspera* and *Patella candei*). There is specific local regulation of this fishery, capture of specimens under 40 mm is not allowed, there is a daily limit to the catches of each vessel (200 kg) and a closure between 1 th December to 28th February.

#### LHM\_FIF\_0\_0\_0

This métier comprises a large number of small vessels, under 10 m, using hand lines, all year round, fishing demersal fish species in the insular shelf.

#### LHM\_LPF\_0\_0\_0

This métier comprises a small number of vessels, under 10 m, using hand lines, mostly during the tuna season (second and third quarter of the year), fishing several species of tuna in the coastal zone of Madeira and Porto Santo.

(c) **Type of Data collection**

**Mainland**

For the metiers and stocks under the responsibility of IPIMAR it was defined the expected sampled trips (Table III.C.3 ).

A single observer will be used on the large pelagic fish long line fleets (ICCAT and IOTC). For ICCAT area it will be sampled 6 trips per year with a single observer on board, during 355 days, he most spent i the 2<sup>nd</sup> half of the year (the most important catches of swordfish are made in the second half of the year and a trip normally lasts three months). For the first time in 2011, IOTC area will be sampled, with a 120 days trip with a single observer on board. The target species is also swordfish.

**Autonomous Region of the Azores (ICCAT)**

The sampling strategy at markets for the selected metier will be conducted, between May and October (since it is a seasonal fishery) in 3 islands where the tuna landings occurs, by the Department of Oceanography and Fisheries contracted staff.

In terms of sampling strategy, the concurrent sampling will be applied with sampling scheme 1.

**Autonomous Region of Madeira (CECAF 34.1.2)**

The type of data collection scheme used will be a probability sample survey. Data will be collected from randomly selected units of the population. Table IIIC.3 summarises the sampling strategies applied in Madeira for the metier-related variables.

(d) **Target and frame population**

**Mainland**

The sampling programme considers the sampling frame to be the same as the population. Note that it is not possible in advance to know how many trips will be executed in a specific year and sampling effort is computed from historical records, with the expectation that the activity of the fleet will be similar.

**Autonomous Region of the Azores (ICCAT)**

The target population is the total number of fishing trips, of the *Pole line* (LHP-FIF) metier, in a month, in Azores fishing ground. The appropriate sampling frame and stratification scheme to provide the required data for this metier, is presented in Table III.C.4.

**Autonomous Region of Madeira (CECAF 34.1.2)**

The target population will be the total trips by métier in each year for CECAF 34.1.2. There were no deviations from the definition included in the NP Guidelines 2011 – 2013. In this sampling strategy the frame population corresponds to the target population.

(e) **Sampling stratification and allocation scheme**

**Mainland**

The sampling stratification and allocation schemes follow the regulation rules. Table III.C.5 shows the sampling intensity for length composition and for all métiers combined.

**Autonomous Region of the Azores (ICCAT)**

Sampling effort presented in Table III.C.4 is proportional to the relative effort (number of fishing trips) and variability of the métiers. The levels presented in Table III.C.4 have been calculated on the basis of an analysis of the number of samples and number of measurements per sample that are needed to attain the specified precision targets.

**Autonomous Region of Madeira (CECAF 34.1.2)**

Table III.C.3 and II.IC.4 shows the total number of expected sampled trips by métier, which will be stratified by quarter. The rationale used to distribute the sampling effort amongst the different métiers was to allocate in each métier an effort proportional to the size of the population (e.g. number of fishing trips).

In the métier LLD\_DWF\_0\_000 which comprise the fishery of the black scabbard fish, a high selective fishery with a very low by-catch, scheme 2 was adopted with about 31% of sampling events concurrently covering the species of groups 1, 2 and 3. This will be implemented through observers on board. About 69% of sampling events will be performed at the market covering species of group 1.

In the métier PS\_SPF\_16\_00 which comprise the fishery of small pelagic fish. Scheme 2 was also adopted with about 33% of sampling events concurrently covering the species of groups 1, 2 and 3. This will be implemented through observers on board. About 67% of sampling events will be performed at the market covering species of group 1.

In the métier LHP\_LPF\_0\_000 which comprise the fishery of tuna, also a highly selective fishery with a very low by-catch, scheme 2 was also adopted with about 34% of sampling events concurrently covering the species of groups 1, 2 and 3. This will be implemented through observers on board. About 66% of sampling events will be performed at the market covering species of group 1.

In the metier LLS\_FIF\_0\_0\_0, which comprise a multispecific fishery with very diverse captures, and vessels without conditions for the inclusion of onboard observers, scheme 1 was adopted with all sampling events at the market concurrently covering species of groups 1, 2 and 3. The same sampling scheme was chosen to cover the metiers MISC\_MOL\_0\_0\_0, LHM\_FIF\_0\_0\_0 and LHM\_LPF\_0\_0\_0.

### **III.C.2 Estimation procedures**

#### **Mainland**

The method used for estimating discards volumes and length composition consists in using the effort in fishing hours as auxiliary variable. The data source for estimating the parameters of the population are provided by DGPA and consists in logbook's information and also the total number of trips performed by fleet (métier). First step is to raise discards to trips with complete logbooks information. Once not all trips have consistent logbook information, total number of trips performed by each fleet is used to do the second step of the procedure that consists in using a raising factor that is the total number of trips performed divided by the number of trips with logbook information. With this procedure, final estimates of discards are obtained for each fleet (métier). This methodology was presented at the ICES 2010 Benchmark Workshop on Roundfish (Fernandes, et al, 2010).

The estimation of catches in volume and length distribution follows in general the total estimator as described by Cochran (1966). In specific cases there are recent scientific developments that are applied (see discards above).

#### **Autonomous Region of the Azores (Div. X)**

The stratification planned is presented in the below table:

<b>Metier LVL6</b>	<b>National metier</b>	<b>Target species</b>	<b>Space strata</b>	<b>Time strata</b>	<b>Comments</b>
<i>GNS_FIF&gt;=100_0_0</i>	<i>GNS_parrot fish</i>	<i>Parrot fish</i>	X	<i>Quarterly</i>	
<i>LHM_MCF_0_0_0</i>	<i>LHM_squids</i>	<i>Squids</i>	X	<i>Monthly</i>	
<i>LHM_FIF_0_0_0</i>	<i>LHM_blackspot seabream</i>	<i>Blackspot seabream</i>	X	<i>Monthly</i>	<i>TAC regulated Quota restriction</i>
	<i>LHM_wreckfish</i>	<i>Wreckfish</i>	X	<i>Monthly</i>	
	<i>LHM_others</i>	<i>White seabream, triggerfish</i>	X	<i>Monthly</i>	
<i>LHP_FIF_0_0_0</i>	<i>LHP_skipjack</i>	<i>Skipjack tuna</i>	X	<i>Monthly</i>	
	<i>LHP_bigeye</i>	<i>Bigeye tuna</i>	X	<i>Monthly</i>	
	<i>LHP_albacore</i>	<i>Albacore tuna</i>	X	<i>Monthly</i>	
	<i>LHP_others</i>	<i>Atlantic bonito, common dolphin fish, bluefish</i>	X	<i>Monthly</i>	
<i>LLS_DEF_0_0_0</i>	<i>LLS_blackspot seabream</i>	<i>Blackspot seabream</i>	X	<i>Monthly</i>	<i>TAC regulated Quota restriction</i>

	<i>LLS_wreckfish</i>	<i>Wreckfish</i>	<i>X</i>	<i>Monthly</i>	
	<i>LLS_Others</i>	<i>Alfonsino, blackbelly rosefish, forkbeard</i>	<i>X</i>	<i>Monthly</i>	<i>TAC regulated Quota restriction</i>
<i>PS_SPF_&gt;=16_0_0</i>	<i>PS_horse mackerel</i>	<i>Horse mackerel</i>	<i>X</i>	<i>Monthly</i>	

Analytical calculations are used to estimate numbers-at-age and its variance. Numbers-at-age are estimated by combining numbers-at-length (the length distribution) and proportions at age for a given length (the age-length key for species that have readings). Market sampling for numbers-at-length and proportion at age were carried out using stratified schemes. Age sampling is stratified by month/quarter depending on species; length sampling is a metier based scheme, stratified by month (quarter in some cases), target species, gear, and island.

At sea-sampling sub-samples are taken and measured at haul level and raised to the haul based on total quantities of retained and discarded fish caught.

### **III.C.3 Data quality evaluation**

#### **Mainland**

The sources of bias identified by WKACCU will be studied as much as possible using the recent COST packages.

Quality checks are implemented in IPIMAR database and several methodologies are used to explore data when computing input information for stock assessment. These procedures are decided and described by the relevant ICES assessment Working Groups.

#### **Autonomous Region of the Azores (Div. X)**

There are some specific problems causing bias for Azorean fisheries data:

1. Weather conditions that prevent samplers from recording length distribution of the landings of smaller vessels; once, with these conditions, these vessels rarely aboard the bigger ports (where samplers are located).
2. Sampling targets depends critically on the goodwill of the fishing industry to market-sampling as well as for sea-sampling.

Constant adjustments are made to the sampling programme to avoid these problems but bias can be caused.

Quality checks and validation procedures are implemented: (1) All samples are checked by a coordinator before the input of data (2) All data introduced in database is checked for syntax errors; (3) A random check of 10% of the data is executed by inspecting the registered data for logical errors; (4) Length distribution and effort samples are then connected with the market landings for future cross examinations.

### **III.C.4 Data Presentation**

All data stored in IPIMAR data bases is available for the assessment working groups (ICES, NAFO SC, ICCAT, etc) and another forum in due time.

In table III.B.1 are reported some of the Planning groups and working groups that supporting to scientific advice and that make use of the data stored in national data bases.

### **III.C.5 Regional Co-ordination**

#### **Div.IXa**

For some stocks/species it will be necessary to plan, at regional level, the minimum number of fish to be measured (Table III.C.4).

In Div. IXa there are no vessels of foreign flags landing in Portuguese ports. About discards there is no need to make a protocol between Spain and Portugal or other MS because the spatial distribution of Portuguese and Spanish discard in Iberian grounds does not overlap (RCM-NA, 2009).

As it was noted in RCM-NA Report (2009) the results of the Pilot Study for eel in 2009-2010 were used to sampling this species in the National Programme in 2011-2013.

As usual Portugal will be involved in the international working groups for stock assessment purposes including some exchange of otoliths (monkfish, sole, sardine)

The RCM NS-EA recommends that Portugal must rectify the denomination of the metier that target redfish in ICES Div I, II, XIV and NAFO 3MLNO, because redfish (*Sebastes spp*) must be considered a demersal fish instead a small pelagic fish. So the metier will be now OTM\_DEF\_100-119\_0\_0 instead OTM\_SPF\_90-100\_0\_0.

### **III.C.6 Derogations and non-conformities**

#### **Other Regions (CECAF, ICCAT, IOTC)**

##### **Autonomous Region of Madeira (CECAF 34.1.2)**

Some doubts arouse to classify the metier pertaining to the capture of gastropod molluscs in Madeira. The criterion adopted was the classification of this metier as Misc, concerning the fishing gear, and Molluscs in relation to the target assemblage. This fishery reaches a reasonably important value and fishing effort.

Doubts also aroused in the use of the proper table of Appendix IV. Although Table 5 is indicated for use in Other Regions comprising CECAF 34.1.2, it does not existed the proper entry for the Madeira fishery of black scabbard (deepwater species) with drifting longlines set in the water column at about 1,000 m deep without contact with the sea floor. Our criteria

was to use the entrance LLD (level 4), deep-water species (level 5) as existent, for example, in table 3 (North Atlantic) of this Appendix.

Some metiers were identified that resulted in captures of an assemblage of small pelagic fishes, mostly chub mackerel and horse mackerel (SPF) with Hand lines (HLM) and set longlines (LLS). Also these entries do not exist in the Table (5) of Appendix IV. In any case these two metiers were not selected to be sampled.

### **III.D Biological – Recreational fisheries**

#### **North Atlantic (ICES areas V-XIV and NAFO areas)**

##### **Mainland**

After 2007, Portugal introduced new rules in recreational fisheries. From then on, each one of those fishermen must hold an official permit to develop such activity. This new regulation also introduced the obligation of catch reporting, as well as brought more precise rules to the development of recreational fisheries. It was expected that, during 2009 it was possible to collect data and have information related with catches for *sea bass* (the only species foreseen under the present data collection framework, for which we have to give information), but, unfortunately, that was not achieved.

In our National Programme for 2009-2010, we asked for derogation and that was accepted. In the meantime, it is our goal, until the end of 2010, to have a plan establishing the necessary steps to be done in order to collect data during 2011.

#### **Other Regions (CECAF, ICCAT, IOTC)**

##### **Autonomous Region of the Azores (ICCAT)**

There are no recreational fisheries directed to the species referred in Appendix 4, table 3. We should point it out that, a pilot study presented by the University of Azores in 2004 showed that there were no bluefin catches by recreational fisheries during the eight years covered by that study. Those conclusions are still accurate, since no BFT catches have been recorded in the recreational fisheries since then. However, if any bluefin tuna recreational catches occur in the Azores, the information can easily be collected, since a straight relation between the University and the local big game fishing companies exists.

##### **Autonomous Region of Madeira (CECAF 34.1.2)**

Following the conclusions of the pilot study carried out in 2003, Madeira game fishing focuses mainly on marlin (white and blue marlin). There are no records of catches of bluefin tuna in this type of recreational fishing in recent years that justify further studies. Moreover, in the case of the Madeira recreational fisheries, complying with the DCF provisions, namely –B.B1.3 (3a)- we refer to the Appendix IV(5) which thus not includes the recreational fisheries in the sampling strategy for this area.

### III.E. Biological – stock-related variables

#### North Atlantic (ICES areas V-XIV and NAFO areas)

##### III.E.1 Data acquisition

###### (a) Selection of stocks to sample

###### **Mainland**

The Table III.E.1 presents the stocks to be sampled and also the derogations.

The following species are asked for derogation due the average landings (2007-2008) to be less than 200 tonnes:

Species	Area	Average landings (t)
<i>Berix spp</i>	ICES IX	34
<i>Merlangius merlangius</i>	ICES IX	102
<i>Pleuronectes platessa</i>	ICES IX	43
<i>Pollachius pollachius</i>	ICES IX	18
<i>Phycis blenoides</i>	ICES IX	11
<i>Salmo salar</i>	ICES IX	0.05
<i>Trachurus mediterraneus</i>	ICES IX	6
<i>Pandalus borealis</i>	NAFO 3MN	0
<i>Pandalus spp</i>	NAFO 3LM	na

It is not asked derogation for *Lepidorombus whiffiagonis* in ICES Div. IXa, although at present there are only a few landings tonnes of this species in ICES Div. IXa and the share of this species in EU TAC to be only 3% because the Portuguese length composition is, usually, used in the stock assessment. So, the *Lepidorombus whiffiagonis* lengths composition will be sampled in landings trips, surveys or discards whenever it occurred.

About European eel (*Anguilla anguilla*) considered a Group 1 species it was presented a Pilot Study in the last NP (NP2009-2010, Annex 1). After the knowledge acquired with that pilot study we are now in conditions to start to collect the eel data routinely in four places (Tagus River and Aveiro, Obidos and Albufeira lagoons).

###### **Autonomous Region of the Azores (Div.X)**

Every fish stock, for which biological variables are required for ICES area X, as indicated in the Appendix VII of Commission Decision 2010/93/UE, is identified in table III.E.1. Concerning this same table, sampling will take place for all stocks not shaded in grey.

###### (b) Type of data collection

###### **Mainland**

The samples for the collection of biological stock-related variables are collected randomly using as data sources surveys, sampling on board and market samples.

###### **Autonomous Region of the Azores (Div.X)**

The majority of species are sold after being separated in, at least, three commercial categories (small, medium and large). It would result in a very expensive programme if one box of the landed size had to be bought. This way, random samples for lengths are taken from the population of fish and sub-samples for ages (stratified by length) are obtained from the fish measured for lengths; allowing the opportunity to select a minimum number of five fish within each length class per month in order to achieve the precision levels demanded by Commission Decision 2010/93/UE.

**(c) Target and frame population**

**Mainland**

The frame and target populations are the same.

**Autonomous Region of the Azores (Div.X)**

Commercial catches are the main source for collecting all variables related with population units. This source of data is representative of the target population once the métiers selected for sampling covers fisheries targeting different length composition of the same stock.

Additional sources of data on stock-related variables will consist on the presence of observers on board the commercial fishing fleet (through the discard programme) and the not funded by DCR demersal survey which annually takes place. This additional sampling will focus particularly on small individuals often not landed in respect to minimum landed size legislation.

**(d) Sampling stratification and allocation scheme**

**Mainland**

The table III E.2 gives an overview of the long-term planning of stock-based variables and table III.E.3 presents an overview of the sampling intensity for age, weight, sex-ratio, maturity and fecundity.

Data sources for each parameter are listed in the Table. Almost for all species the numbers collected only in one source is inadequate, so to obtain the parameters it will be used data coming from the different sources (surveys, commercial fishery catches and market).

In table III.E.2 is missing maturity data for some species in NAFO areas due to constraints on gonad's collection on board. There is no way of extracting or storing them on trawlers (a fishing trip lasts an average of four months). In addition, the fast processing of the fish after each haul is not compatible with the harvesting of gonads.

**Autonomous Region of the Azores (Div.X)**

Information on planning of sampling and its intensity, for stock-based variables, is indicated in tables III.E.2 and III.E.3 respectively.

The requested periodicity for the collection of the variables referring to the alfonsinos and blackspot seabream population units is triennial. However, since these species are of very high economical importance in the local context, they are both under TAC regulations and the fishing quotas have been annually achieved, the continuity of the collection of biological information should be maintained in an annual basis.

Regarding *Molva dypterygia* the DCF demands a collection of data every three years but once it consists on a specie from Group 1 and the number of individuals available for sampling is low, an annual basis sampling will be conducted in order to obtain a robust historical data series of this specie.

In the case of the bluemouth rockfish (*H. dactylopterus*), wreckfish (*P. americanus*) and *Sparidae* it is not required the collection of information on variables such as weight, sex and maturity. However, since fish will have to be bought for the collection of otoliths for age determination, they will also be used in gathering the remaining biological information, at an annual level, since they are locally considered as highly valuable species and some of the most important in the set longline catches.

The biological parameters sex ratio and maturity are referred to age for all species, except for *Octopus vulgaris* for which the reference will be the length.

The biological parameters sex ratio and maturity are referred to age for all species, except for *Centrophorus granulosus*, *Dalatias licha*, *Isurus oxyrinchus*, *Katsuwonus pelamis*, *Octopus vulgaris*, *Prionace glauca*, *Raja clavata*, *Sarda sarda*, *Squaliformes*, *Thunnus alalunga*, *Thunnus obesus* and *Xiphias gladius*, for which the reference will be the length.

Acquisitions of fish at the fish auction will be the main source for the collection of the variables related with the population units, with exception of those individuals whose origin is from the discard programme and survey.

### **III.E.2 Estimation procedures**

#### **Mainland**

The methods used for estimating the stock variables are usually described and sometimes decided by the relevant ICES assessment Working Groups. The procedures are standardized at ICES level paying attention to the specificity of each stock/species.

In general the stratified estimator of the total (Cochran, 1953) is used, as specified by Jardim et.al (2004). The stratification is based on quarters, regions and métiers. This procedure is implemented on IPIMAR's database to process the information each year and provide it to assessment working groups. However, depending on the objective of the work being done, the standard estimator may have slight changes to meet specific details of the study.

#### **Autonomous Region of the Azores (Div.X)**

Total numbers-at-age are estimated in the following way. Sampled numbers-at-length for each trip are raised to estimate numbers-at-length for the trip, which are summed to estimate number-at-length for the trips sampled in each stratum. Age-length keys are created for each stratum by summing the ages-at-length over the individual trips in the stratum, and applied to the numbers-at-length to obtain numbers-at-age for the trips sampled in each stratum. These are raised by the ratio of landed weight to sampled weight for each stratum to obtain an estimate of numbers-at-age for that stratum. Numbers-at-age for strata for which there are landings but have not been sampled are estimated by “filling-in” using numbers-at-age for “similar” strata using fill-in rules.

### **III.E.3 Data quality evaluation**

#### **Mainland**

The sources of bias identified by WKACCU will be studied as much as possible using the recent EU COST packages.

In Div IXa a quality control procedures are implemented on the data base. The checks assure the type of data and the range of the variables are correct. A random check of 10% of the data per year is executed by inspecting the sample forms and the registered data.

#### **Autonomous Region of the Azores (Div.X)**

See section III.E.1 Data acquisition, sub-section (d) Sampling stratification and allocation scheme.

### **III.E.4 Regional coordination**

#### **Mainland**

Portugal regularly participates in the RCM North Atlantic and follows the agreed procedures and recommendations. There is an existing bilateral agreement with Spain for *Sebastes mentella* otholits exchange (Flemish Cap), readings and check on age criteria. Exchange of *Merluccius merluccius* otholits coordinated between Portugal and Spain.

<b>RCM NA 2009 Recommendations – Stock Related Variables</b>		
<b>Maturity sampling</b>	RCM NA recommends MS to refer to the table in Annex X of this report for elaborating maturity sampling programmes, when drafting their National Programme proposals 2011-2013	Portugal assures maturity sampling for the species referred in the Annex X of the report. Until now there is no regional co-ordination for the preparation of maturity sampling programmes.
<b>Increase of age sampling</b>	The RCM NA recommends that sampling for age should be increased in order to meet the required sampling levels for saithe (Vb), turbot (all areas) and John Dory (all areas).	John Dory is the only relevant stock for Portugal, with insignificant landings. Species is not selected for sampling.

<b>Blue whiting ace to test for international analysis in marries COST</b>	The RCM NA recommends that blue whiting should be used as a test case for international raising and further analysis in the COST-package.	Portugal is waiting for the contact study case coordinator to proceed with this task.
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### **III.E.5 Derogations and non conformities**

#### **Mainland**

As referred in table of the point III.E.1 (a) due to the low level of landings of several species in Div IXa, Portugal would seek derogation from sampling this species.

#### **Autonomous Region of the Azores (Div.X)**

Formal derogations with regard to the data collection on “Stock-related variables” are already included in Table III.E.1. No further derogations are requested.

### **North Sea & Eastern artic**

### **III.E.1 Data acquisition**

#### **(a) Selection of stocks to sample**

#### **Mainland**

The stock selection has been made according the Commission Decision 2010/93/EU Appendix VII as it's shown in tables III\_E\_1, III\_E\_2 and III\_E\_3.  
As previously referred, the fleet operating in these ICES areas I and II is the same operating in NAFO area. The main stock involving the Portuguese fleet are *Sebastes mentella* and *Gadus morhua*

#### **(b) Type of data collection**

#### **Mainland**

The samples of biological stock are collected randomly using sampling on board as data source.

#### **(c) Target and frame population**

#### **Mainland**

The frame and target populations are the same.

#### **(d) Sampling stratification and allocation scheme**

#### **Mainland**

The table III E.2 gives an overview of the long-term planning of stock-based variables and table III.E.3 presents an overview of the sampling intensity for age, weight, sex-ratio, maturity and fecundity.

In table III.E.2 is missing maturity data on *Sebastes mentella* and *Gadus morhua* in Area I,II because it is practically impossible to collect gonads on board. There's no way of extracting or storing gonads on trawlers (a fishing trip lasts an average of four months). In addition, the fast processing of the fish after each haul is not compatible with the harvesting of gonads.

### **III.E.2 Estimation procedures**

#### **Mainland**

The methods used for estimating the stock variables are usually described and sometimes decided by the relevant assessment Working Groups.

In general the stratified estimator of the total (Cochran, 1953) is used. The stratification is based on haul, métier, haul and quarter. This procedure is implemented on IPIMAR's database to process the information each year and provide it to assessment working groups. However, depending on the objective of the work being done, the standard estimator may have slight changes to meet specific details of the study.

### **III.E.3 Data quality evaluation**

#### **Mainland**

The sources of bias identified by WKACCU will be studied as much as possible using the recent EU COST packages.

### **III.E.4 Regional coordination**

#### **Mainland**

Portugal regularly participates in the RCM North sea and Eastern Artic and follows the agreed procedures and recommendations.

<b>RCM NS&amp;EA 2009 Recommendations – Stock Related Variables</b>		
<b>Maturity sampling</b>	The RCM NS&EA recommends MS to refer to the table in Annex 5 of this report for elaborating maturity sampling programmes, when drafting their National Programme proposals 2011-2013	Portugal is trying to insure maturity sampling of the planned species by including it on the recommended periods of spawning.

### **III.E.5 Derogations and non conformities**

#### **Mainland**

Table III.E.1 presents the stocks to be sampled and also the derogations. In North Sea & Easter Artic, there are no species asked for derogation.

### **Other Regions (CECAF, ICCAT, IOTC)**

#### **III.E.1 Data acquisition**

##### **(a) Selection of stocks to sample**

#### **Mainland**

The stock selection has been made according the Commission Decision 2010/93/EU Appendix VII as it's shown in tables III\_E\_1, III\_E\_2 and III\_E\_3.

#### **Autonomous Region of the Azores (ICCAT)**

Every fish stock, for which biological variables are required for ICES area X, as indicated in the Appendix VII of Commission Decision 2010/93/UE, is identified in table III.E.1. Concerning this same table, sampling will take place for all stocks not shaded in grey.

#### **Autonomous Region of Madeira (CECAF 34.1.2)**

All the fish stocks referred in Appendix VII, occurring in the Central Eastern Atlantic (CECAF 34.1.2) and exploited by the fleet based in Madeira, for which data collection is required, are showed in table III.E1. As already stated, fisheries from Madeira rely in a very small number of important species, which will be sampled. In the case of the fish stocks indicated for this area in Appendix VII but for which there are no landings reported or for which derogation is requested due to the very low level of landings are highlighted in grey. Also in the case of some tuna species (*T. obesus* and *K. pelamis*), although the price for the acquisition of specimens for biological sampling will be, most probably, very high, a strategy for sampling the specimens during evisceration in the industrial unities will be pursued as a way to reduce the costs of biological sampling.

##### **(b) Type of data collection**

#### **Mainland**

The samples for the collection of biological stock-related variables are collected randomly using sampling on board as data source.

### **Autonomous Region of Madeira (CECAF 34.1.2)**

The type of data collection scheme used will be a probability sample survey. Data will be collected from randomly selected units of the population.

#### **(c) Target and frame population**

##### **Mainland**

The swordfish (*Xiphias gladius*) is the target species for both fleet operating in North and South Atlantic (for management purposes the line 5° N separates north and south swordfish stocks). However, in times and areas where the species is scarce, the fleet opportunistically takes advantage on other highly migratory species, such as pelagic sharks (*Prionace glauca*, *Isurus oxyrinchus*, *Sphyrna spp*) and tropical tunas (mainly *Thunnus obesus* and *Thunnus albacares*). When the abundance of sharks is particularly high, in order to increase the efficiency of fishing gear (given the commercial value of their fins in the case of vessels licensed for its removal), the monofilament line is replaced by a braided steel. In this latter case may speak of directed fishing for pelagic sharks.

### **Autonomous Region of Madeira (CECAF 34.1.2)**

The target population will be the stocks within the CECAF 34.1.2. Geographic area. The frame populations and target populations are the same.

#### **(d) Sampling stratification and allocation scheme**

##### **Mainland**

The table III E.2 gives an overview of the long-term planning of stock-based variables and table III.E.3 presents an overview of the sampling intensity for age, weight, sex-ratio, maturity and fecundity. Data sources for each parameter are listed in the table.

### **Autonomous Region of the Azores (ICCAT)**

Information on planning of sampling and its intensity, for stock-based variables, is indicated in tables III.E.2 and III.E.3 respectively.

The biological parameters sex ratio and maturity are referred to length for the species *Centrophorus granulosus*, *Dalatias licha*, *Isurus oxyrinchus*, *Katsuwonus pelamis*, *Prionace glauca*, *Raja clavata*, *Sarda sarda*, *Squaliformes*, *Thunnus alalunga*, *Thunnus*

### **Autonomous Region of Madeira (CECAF 34.1.2)**

Table III. E.2 indicates the long term planning for the collection of stock based variables and Table III.E.3 the sampling intensity forecasted. The main source for collecting the stock-related variables will be the commercial fishery. To ensure monitoring of biological parameters of stocks of species that are vital for the Madeira fisheries sector which depends from these resources heavily influenced by exogenous changes, it is necessary to ensure an annual sampling. Thus, despite the sampling periodicity determined by the regulation in force, Madeira ensures the ongoing monitoring of species of high economic importance.

### **III.E.2 Estimation procedures**

#### **Mainland**

The methods used for estimating the stock variables are usually described and sometimes decided by the relevant assessment Working Groups.

In general the stratified estimator of the total (Cochran, 1953) is used, as specified by Jardim et.al (2004). The stratification is based on quarters, regions and métiers. This procedure is implemented on IPIMAR's database to process the information each year and provide it to assessment working groups. However, depending on the objective of the work being done, the standard estimator may have slight changes to meet specific details of the study.

#### **Autonomous Region of Madeira (CECAF 34.1.2)**

Fish will be sampled from the commercial fishery of Madeira. Total length cm (TL), total weight in grams (W), and otoliths (when applicable) collected and key age obtained from direct readings of otoliths. The annual nature of the growth zones in the otoliths will be evaluated by means of marginal increments analysis.

For all the specimens biologically sampled the sex will be identified and the maturity stage determined macroscopically according to proper scales. The sex ratio (males:females) will be analyzed. Variables will be raised from samples to the population level.

### **III.E.3 Data quality evaluation**

#### **Mainland**

The sources of bias identified by WKACCU will be studied as much as possible using the recent EU COST packages.

#### **Autonomous Region of Madeira (CECAF 34.1.2)**

In each species, a number of specimens to be sampled for length, age, sex-ratio and maturity was planned taking in account previous experience, that will provide a good coverage of landings, allowing to meet the target precision required, in compliance with the Commission Decision. Variability of the data will be assessed through the computation of the Coefficients of Variation.

### **III.E.4 Regional coordination**

Portugal regularly participates in the regional Coordination Meetings and follows the agreed procedures and recommendations. There is an existing bilateral agreement with Spain for *Sebastes mentella* otoliths exchange (Flemish Cap), readings and check on age criteria. Exchange of *Merluccius merluccius* otoliths coordinated between Portugal and Spain.

### **III.E.5 Derogations and non conformities**

#### **Mainland**

As referred in table of the point III.E.1 there are no derogations asked for stocks on other regions

#### **Autonomous Region of Madeira (CECAF 34.1.2)**

Fish stocks indicated for this area in Appendix VII but for which there are no landings or a very low level of landings reported, derogation is requested (table III.E1).

### **III.F Transversal variables**

#### **III.F.1 Capacity**

##### **III.F.1.1 Data acquisition**

**Data Source:** National fleet registry, integrated on the Sistema Integrado de Informação das Pescas (SI2P).

SI2P comprehends all the databases needed, such as the logbook database, the sales notes database and also the fleet database. SI2P, being an Oracle database, allows all the necessary data cross-tabulations.

These data are recorded and updated pursuant to Regulation (EC) No. 26/2004. Under this Regulation the following data, amongst other, are available by vessel:

- i) Gross tonnage;
- ii) Engine power, expressed in KW;
- iii) Age of the vessel.

##### **III.F.1.2 Data Quality**

The follow up of the fleet information is made in accordance with the rules laid out by the Reg. (EC) No. 26/2004, where it is foreseen that each MS should have the fleet registry permanently updated and the quality of its information constantly monitored.

#### **III.F.2 Effort**

##### **III.F.2.1 Data acquisition**

#### **Mainland**

Data source for each variable and fleet segment are well described on table III.F1. Data source is at first instance logbooks data, but also sales notes. Frame population comprehends all vessels with annual permit to operate. Regarding small scale fleet, data source is a survey, based on an annual panel methodology.

For the small scale fleet, Portugal has implemented during 2008 a new methodology with the purpose of identify the metiers within this segment. The new approach is based on a panel survey methodology, with an annual rotation of 20% of the total units. Attached, under annex III and IV, we submit the methodology for the sample definition, as well, the inquiry developed for this purpose. First annual results were produced at the end of 2009, enabling the identification of metiers and it relation with gears licensing.

Data for the small scale fisheries collected under the new survey have a target precision of 5%. Sample strata definition was based on:

- 1° - Area of operation – spatial partition strata – North, Centre and South; and,
  - 2° - Fishing gear permits hold by each vessel – clustering vessel by gears/ group of gears.
- Based on this two level partition we seek to get results on:
- Identification of distinct metiers operated in each region;
  - Identification of the seasonal patterns by metier/region;
  - Estimation of fishing days by metier;
  - Estimation of soaking time for passive gears by metier;
  - Estimation of number of traps, nets by metier.

#### **Autonomous Region of the Azores (Div.X)**

DOP/Uac will be in charge of the collection of the information concerning the fishing effort, in all the harbours where technicians/samplers are located. The information to be collected on effort refers to: days at sea, fishing days, number of fishing trips, number of fishing gears, number of fishing operations, number and size of nets, number of hooks and lines and number of traps.

The main source of information for gathering these transversal variables will be through logbooks and inquiries to the boats present in the harbours at unloading time. Those inquiries includes all fleet segments, but with increased effort on those that are not obliged to fill a logbook (< 10 meters). For the small scale fleet (boats under 10 meters), DOP/Uac will distribute by the fisherman, during 2011, a new inquiry based on a panel survey methodology with the purpose of collecting more information of this fleet segment.

#### **Autonomous Region of Madeira (CECAF 34.1.2)**

As in previous years, we will continue gathering all of the relevant information concerning the fishing effort required in Appendix VIII (Table III.F.1). The main sources of information for collecting these transversal variables will be the logbooks, for vessels more than 10 m of length and inquiries to the smaller boats as they are present in the harbours at unloading time. Those inquiries include all fleet segments. An increased effort will be made in relation to those vessels not obliged to fill logbooks (<10 m).

### **III.F.2.2 Data quality evaluation**

#### **Mainland**

For vessels larger than 10 meters the process of the effort variables estimation, such as indicated under table: *“Fleet with an overall length of more than 10 meters”, point III.F.2.1,*

is based on a simple calculus procedure. Complying with the Regulations that support the new DCF legislation, Portugal should guarantee the exhaustive collection of data. For vessels under 10 meters data collected through surveys will be crosschecked with the information from sales notes.

Regarding data collected running panel survey; data quality is assured by fixing a target precision of 5%.

#### **Autonomous Region of the Azores (Div.X)**

The data collected through logbooks will be crosschecked with the information from sales sheets in order to validate the consistency among different variables. The same procedure will be applied to the information collected through inquiries.

#### **Autonomous Region of Madeira (CECAF 34.1.2)**

Quality of data collected will be ensured by a systematic cross checking of the main sources of information used namely logbooks, sales notes and inquiries in the harbour (Table IIIF1). In the particular case of effort, where variables are to be collected through inquiries variability will be indicated.

#### **IIIF.2.3 Data presentation**

Data for reference year 2010 will be available for the end- user between December 2011 and January 2012.

Data for reference year 2011 will be available for the end-user between December 2012 and January 2013.

Data for reference year 2012 will be available for the end-user between December 2013 and January 2014.

#### **IIIF.2.4 Regional coordination**

Portugal regularly participates in the RCM North Atlantic and follows the agreed procedures and recommendations.

#### **IIIF.2.5 Derogations and non conformities**

No derogation is applied.

#### **IIIF.3 Landings**

##### **IIIF.3.1 Data acquisition**

In Portugal all vessels landing fresh fish are obliged to sell in first sale; therefore, data regarding all fleets landing in national ports, including small scale fisheries, is census-like.

The sources of information on landings of fresh or refrigerated fish in national ports are the national designated authorities for that purpose, DOCAPESCA SA and LOTAÇOR E.P., for

mainland ports and Azores ports, respectively, and the Regional Directorate DRPM, for Madeira ports.

Those entities electronically register all the data from 1<sup>st</sup> sale, and then send the information to the national administration, according with the rules laid out in article 9° of the Control regulation, Reg. (EC) No. 2847/93.

On the topic of fish processed on board, data for landing are outcomes from logbooks and landing declarations.

In both situations, conversion factors are applied in order to obtain landings in a live weight basis. The complete list of conversion factors is presented in table III.F.3.

Variable	Data Source	Methodologies to derive final estimates
Value of landings, total and per commercial species.	Sales notes	Sum of the values by vessel and commercial species;
Live weight of landings, total and per species.	Logbooks and Sales notes	Fresh fish landed in national harbours – Live weight obtained through the application of conversion factors; Frozen fish and/or fish landed abroad – Live weight estimated based on logbook landing declaration.
Prices by commercial species.	Sales notes	Estimate of the a weighted average by species;
Conversion factor per species		Table III.F.3

### **III.F.3.2 Data quality evaluation**

On the subject of landings in national ports, meeting with the cross-checks foreseen under the control legislation, Portuguese administration cross-checks all the information from VMS, logbook and sales notes in order to identify possible wrong declarations.

As far as landings in other MS harbours are concerned, Portugal cross-checks the landing data available in the logbook's landing declaration with the figures sent to the Commission by each of those MS, via catch reports, namely catch reports B and D.

In the event of landings or transshipments in third country ports, where the sales notes are absent, the needed cross-checking is made between logbook figures and VMS, in what identification of operation areas is concerned. When transshipment takes place the collection of the T2M documentation allows catch volume by species tabulation.

### **III.F.3.3 Data presentation**

Data for reference year 2010 will be available for the end user between December 2011 and January 2012.

Data for reference year 2011 will be available for the end user between December 2012 and January 2013.

Data for reference year 2012 will be available for the end user between December 2013 and January 2014.

### **III.F.3.4 Regional co-ordination**

Following the adoption of ERS legislation from January 2009 on, sales notes from national vessels landing in Spain, or in any other MS, and sales notes derived from those landings will be received by the national authorities through electronic means.

### **III.F.3.5 Derogations and non conformities**

No derogation is applied.

### **III.G Research surveys at sea**

#### **III.G.1 Planned surveys**

#### **2011-2013**

##### **1 - Flemish Cap Groundfish Survey, FCGS**

At present the RV Visconde d'Eza, belonging to Spain carries out these surveys, which have been running since 1988. Portugal has taken part by means of a team of one scientist and two technicians.

#### **Main objective:**

- To estimate indices of abundance and biomass, by length and age classes, of the principal demersal species (cod, redfish, plaice, Greenland halibut, grenadiers and shrimp).

#### **Other objectives:**

- To study the distribution and behaviour of species;
- To study biology and feeding;
- To carry out a hydrographical characterisation using CTD.

The data is stored in the IEO data base.

The historical series of data from this survey, together with data from on-board sampling, either of the Spanish or the Portuguese commercial fleet, make it possible to produce an annual assessment of stocks of the principal species in NAFO Sub-area 3. The Portuguese and Spanish fleets are the most important fleets operating in regulatory Sub-area 3.

This survey is co-ordinated by Spain and Portugal. The protocols of the EU bottom trawl survey series on Flemish Cap follows the guidelines described on Doubleday (1980) and updated, as regards stratification design, on Bishop (1994):

- Doubleday, 1981. Manual of groundfish surveys in the Northwest Atlantic. NAFO Sci. Coun. Studies 2, 55p.
- Bishop, C. A., 1994. Revisions and additions to stratification schemes used during research vessel surveys in NAFO Subareas 2 and 3. NAFO SCR. Doc. 94/43 (rev.). Ser. No N2413.

## **2 - Western IBTS 4<sup>th</sup> quarter – IBTS Q4**

### Main objective:

- To estimate indices of biomass and abundance, by length and by age classes, of the principal commercial and non-commercial demersal species (hake, anglerfish, megrims, Atlantic horse mackerel, pouting, blue whiting, etc), using bottom trawls during daylight;
- To estimate the indices of recruitment of the principal species.

### Other objectives:

- To study the distribution and behaviour of species;
- To study biological parameters of species: maturation, feeding, etc;
- To collect oceanographic data using CTD and ecosystem indicators (1 to 4).

At ICES level this survey is co-ordinated by the International Bottom Trawl Survey Working Group.

- The Protocols for this survey are published in:

a) 2002. Manual for the International Bottom Trawl Surveys in the Western and Southern Areas - Revision II. Addendum to ICES CM 2002/D:03 Ref.: G, ACFM, ACE, 28 pp. *Agreed during the meeting of the International Bottom Trawl Survey Working Group, 8-12 April 2002, Dublin.*

b) 2008. Up-to-date Protocol in section 7.2, pp 97-99, Report of the International Bottom Trawl Survey Working Group (IBTSWG), ICES CM 2008/RMC:02, 228 pp. 31 March-4 April 2008, Vigo, Spain.

c) <http://datras.ices.dk/Home/Descriptions.aspx> - ICES site with protocols and surveys data

Data from this type of survey are also stored in the CRUZDEM national database.

## **3 - Sardine, Anchovy and Horse Mackerel Acoustic survey**

### Main objective:

- To estimate, by eco-integration, the frequency of sardine in number and biomass by classes of length and age groups on the Portuguese coast in Div. IXa and Spanish waters in the Gulf of Cadiz (Div. IXa), using pelagic trawls during daylight.

### Other objectives:

- To study the geographical distribution of sardine and other pelagic species, particularly European anchovy (Div. IXa), and their behaviour;
- To monitor (during the night) the frequency and distribution of sardine eggs, with CUFES nets, by continuous sampling and Calvet stations;
- To monitor the oceanographic conditions with continuously-recording thermosalinometer and minilog;
- To estimate the frequency of European anchovy, in number and biomass, by classes of length and age;
- To collect ecosystem indicators (1 to 4) if possible and recordings of the bed sea.

This survey is coordinated by the ICES WGACEGG. The Protocols are published in:

- ICES, 2007. Report of the Working Group on Acoustic and Egg surveys for sardine and Anchovy in ICES Areas VIII and IX, (WGACEGG). ICES CM 2007/LRC:16.

Biological data from this type of survey are also stored in a national database.

#### **4 - Nephrops TV Survey Offshore Portugal, UWTV (FU 28-29)**

##### Main Objectives:

- To estimate abundance indices and densities of Norway lobster (*Nephrops norvegicus*) in the crustacean fishing grounds off Portugal (ICES Division IXa, Functional Units 28 and 29) using a combined survey (trawl and UWTV survey);
- To estimate abundance indices of other important crustacean species as rose and red shrimp (*Parapenaeus longirostris* and *Aristeus antennatus*) and fish by-catch;
- To estimate the sex and length structure of the of the target species by area/depth;
- To study the catchability of Norway lobster (for the research trawl gear) and compare the abundance estimates from trawl and UWTV.

##### Other objectives:

- To collect sediment samples to study the relationship between sediment characteristics and *Nephrops* densities and size distribution.
- To collect information on the reproductive cycle and other biological characteristics of the target species;

The Protocols for this survey are published in:

- ICES. 2007. Workshop on the Use of UWTV Surveys for Determining Abundance in Nephrops Stocks throughout European Waters. 17–21 April 2007, Heraklion, Crete, Greece. ICES CM 2007/ACFM:14. 198 pp.

**- During 2011-2013** the last three surveys will be carried out and **more two triennial surveys**, will be performed in 2011 (Sardine DEPM) and in 2013 (International Mackerel and Horse Mackerel Egg Survey, MEGS) (Appendix IX of the Commission Decision 2010/93/EU)

**2011**

**- Sardine DEPM**

Main objectives:

- To estimate the sardine egg production and the spawning stock size;
- To study the sardine and anchovy (and other pelagic species) eggs distribution using the ichthyoplankton sampling on fixed (CalVET) and underway (CUFES) stations;
- To monitor the oceanographic conditions (sub-surface water temperature, salinity and chlorophyll density) with information obtained on the fixed stations and underway using sensors coupled to CUFES;
- To obtain biological parameters from the adult fish to apply the method (DEPM).

The Portuguese RV Noruega will cover the geographical area of Division IX a (Portugal and Spain - Cadiz).

-Protocol - The coordination and methodologies for this international survey are agreed in the Working Group on Acoustic and Egg surveys for Sardine and Anchovy in ICES Areas VIII and IX (ICES, 2006).

At present IPIMAR is updating its Data Base for this type of survey.

**2013**

**- International Mackerel and Horse Mackerel Egg Survey, MEGS**

Main objective:

- To estimate the mackerel and horse mackerel egg production and the spawning stock size;
- To determinate the fecundity for both species.

At present IPIMAR is updating its Data Base for this type of survey.

As recommended by the ICES Working Group on Mackerel and Horse Mackerel Egg Surveys (WGMEGS, April 2005), horse mackerel southern stock spawning biomass will be assessed by Portugal and Spain during the 2007 spawning season by means of the Daily Egg Production Method (DEPM). Spatial distribution and abundance estimates of fish eggs in the horse mackerel southern stock (ICES Division IXa) will be obtained during a 35 days cruise on February/ March on triennial basis (in 2013 at present programme).

- The protocols surveys were defined in the ICES WGMEGS in 2005 and updated in ICES WGMEGS REPORT 2010 (ICES CM 2010/SSGESST:02).

### **III.G.2 Modifications in the surveys**

No changes are planned to occur in the planning of the surveys in relation to the initially programmed.

### **III.G.3 Data presentation**

The survey data is available in time for the respective working groups for assessment purposes. So, it is presented some of those Working Groups that use the survey data:

- 1- Flemish Cap Groundfish Survey, FCGS – NAFO – Scientific Council;
- 2- Western IBTS 4<sup>th</sup> quarter – IBTS Q4 – Working Group on the Assessment of Hake, Monk and Megrim (WGHMM); Working Group on Widely Distributed Stocks (WGWIDE); Working Group on Cephalopod Fisheries and Life History (WGCEPH); Working Group Elasmobranch Fishes (WGEF);
- 3- Sardine, Anchovy and Horse Mackerel Acoustic survey – Working Group on Anchovy and Sardine Assessment (WGANSA);
- 4- Nephrops TV Survey Offshore Portugal, UWTV (FU 28-29) – Working Group on the Assessment of Hake, Monk and Megrim (WGHMM); SG Nephrops Surveys (SGNEPS);
- 5- Sardine DEPM (triennial) – Working Group on Anchovy and Sardine Assessment (WGANSA);
- 6- International Mackerel and Horse Mackerel Egg Survey, MEGS (triennial) – Working Group on Widely Distributed Stocks (WGWIDE).

For others end-users, they must following the rules.

### **III.G.4 Regional coordination**

All the five surveys referred above and included in Appendix IX (Commission Decision 2010/93/EU) have international coordination and their respective protocols are indicated above in each survey item.

### **III.G.5 Derogation and non conformities**

No modifications to the surveys are planned for the period 2011-2013.

## **IV. Module of the evaluation of the economic situation of the aquaculture and processing industry**

### **IV.A Collection of economic data for the aquaculture**

The aquaculture sector comprises 1,472 licensed farms, covering a total area around 2,000 hectares, 87% of which are bivalve bottom farms, 11% are earthen pond fish

farms, and 2% are offshore farms (fish and bivalves). This represents approximately 1,000 active companies which in turn employ about 5,300 individuals on a permanent basis. The biggest employment sources are the mollusc farms, an ancient form of aquaculture which employs an estimated 3,900 people.

Production values vary between 6,000 and 8,000 tons due to fluctuations in bivalve production. Finfish production has slowly but steadily increased and currently represents a higher value and volume than bivalve molluscs.

Marine production is the greatest contributor to the aquaculture sector. It includes both fish and bivalve species but they have distinct performances. Fish production is slowly increasing to similar volumes and higher values.

The majority of fresh water production is brown and rainbow trout. Brown trout is mainly used for restocking and the rainbow for food. The production volume has slowly decreased over the last years, from 1,300 tons to 900 tons. This is due to strong competition from other countries.

#### **IV.A.1 General description of the aquaculture sector**

#### **IV.A.2 Data acquisition**

As much as the aquaculture sector is concerned, Portuguese Fisheries Administration acts as the national authority for the production of statistical data. Since ever, all the work undertaken within the aquaculture sector is related to the production of data under the European Statistical System.

##### **(a) Definition of variables**

Variables to be collected are those identified in Appendix X of Commission decision 2010/93/UE with respective guidelines.

Variables related with personnel costs, namely value of imputed value of unpaid labour, the methodology for estimation will be defined during the present year and with the support of the National Institute for Statistics.

Employment variables, such as FTE will be estimated in accordance with Study Fish/2005/14.

During 2011, it will be collected and produced data for reference year 2010 and 2009. This data, in a final and validated form, will be available by the end of 2011. From 2012 on, data for year  $n$  will be collected and treated during year  $n+1$  and their availability will be assure at the end of year  $n+2$ .

##### **(b) Type of data collection**

Following the publication of Regulation (EC) no. 788/1996, DGPA developed a statistical operation, together with the Instituto Nacional de Estatística (INE), performed annually. The

sample unit is the establishment and the population comprehends all those establishments that, at the reference year, had legal conditions to undertake any aquaculture activity.

As result of different levels of activity and also target population (hatchery and fish units, shellfish units), two kinds of questionnaires were developed, both as census-like operations. The first one, more complete, is set to the universe of hatcheries and all fish farming units and collects data on:

1. Depiction of activity conditions (area of production, regimen and system of production);
2. Number of employees at 31 December of the reference year;
3. Livestock;
4. Costs of activity (energy costs and feed costs);
5. Production of juveniles (by species and destination) ;
6. Production of full-grown fish;
7. Sales of juveniles;
8. Sales of full-grown fish.

The second questionnaire is developed to collect data on shellfish farming units, namely;

1. Amount produced by species;
2. Amount of seeds introduced.

This statistical operation, adapted following the approval of the new EC regulation for the production of aquaculture statistics, supports the production of the answers for the following DCR variables:

- Energy costs,
- Raw material volume, and
- Sales Volume.

As a result of the work undertook during 2009 and expectedly finished by the end of 2010, Portugal will be in position to estimate the economic variables as presented in Appendix X of Commission Decision. Variables produced based on this source are identified on table IV.A.3 as ‘financial accounts’.

This work will be developed with the support of the National Institute for Statistics which will grant the access to economic data from national accounts, collected under the operation ‘Informação Empresarial Simplificada’ – IES. Annual data will be supplied to fisheries administration, and economic data, by enterprise will be stored on SI2P in order to facilitate the final variables estimates.

### **(c) Target and frame population**

The two operations that supports Aquaculture programme have different target population. The first one, administrative inquiry, has a population comprises by all the aquaculture establishments, regardless of being the first or second activity of the enterprise. The unit of observations is the establishment identified with it aquaculture annual licence register.

For the second operation, the one supported by National Institute for Statistics, the unit of observation is the enterprise, and will be considered the enterprises with primary activity under NACE Code 03.02, as orientations laid down on Commission Decision.

Relation between both operations is assured by the National Registry of Aquaculture Units and Enterprises, where all the population of enterprises and units are stored, despite of nature of the aquaculture activity (primary or secondary).

(d) **Data Sources**

Described on title (b) type of data collection.

(e) **Sampling Stratification and allocation scheme**

Both supporting operations are census like operations, therefore not applicable.

**IV.A.3 Estimation**

Estimation process for primary variables is supported by estimators of total for census-like information.

To deal with non-responses, a problem mainly concerned with artisanal units for production of bivalve molluscs (clams), the methodology developed and in use since 2006, is based on the application of raising factors. Each year, based on the answer collected, is estimated the average yield (Y) of production, tonnes per hectare. For all non respondents units, based on their farming area, and applying the annual Yield, is estimated the total clam production for the reference year.

**IV.A.4 Data Quality evaluation**

Data collected under the present methodology is subject to a series of validation procedures in accordance with the rules already evaluated under the Methodological document produced to INE. Both sources are census operations and evaluation of the coverage rate is foreseen.

**IV.A.5 Presentation**

Data for year  $n$ , will be available to the end user at year  $n+2$ .

**IV.A.6 Regional coordination**

Not Applicable

**IV.A.7 Derogations and non-conformities**

Not Applicable

**IV.B. Collection of data concerning the processing industry**

**General description of the processing industry**

At the end of 2007 the number of fish and aquaculture processing companies (fresh, frozen, cannery, salting and drying) were 154. The production is over 150 000 tons per year, with a

turnover of 1 300 million Euros. More than 6 300 people work directly at the plants, mostly women work force.

The main segments are:

- a. Fresh (multi-species from the domestic fleet and small pelagic from seine segment; bivalves, cephalopods)
- b. Frozen (multi-species, from imports – Hake, sardine, redfish, cod, scabardfish, cephalopods, bivalves, crustaceans)
- c. Cannery (small pelagic from local fleet and tuna from imports (90%) and local Azores fleet)
- d. Salting and drying (cod and similar species, over 95% from imports).

The Portuguese fish processing industry has an enormous dependency on imports, and that shall be the same in future. Only cannery still depends on domestic production (for sardine and mackerel, while tuna has high dependency on third country imports).

To the salting and drying subsector the dependency will be the same for the next years. It isn't expected that aquaculture can provide an alternative in the next years; even there is same raw material that came from that kind of origin.

Domestic market shows slow growth rate after some decrease on cannery due to international market situation, and more recent evolution of international cod price: changes on international market for cod supply brought instability, but also opportunity.

Cannery exports knew unexpected growth in last couple years: while the domestic market get a considerable growing in the last years, absorbing the diminishing export of sardine products that occurred at the same time.

#### **IV.B.1 Data acquisition**

##### **(a) Definition of variables**

Variables to be collected are those identified in Appendix XII of Commission decision 2010/93/UE with respective guidelines.

Variables related with personnel costs, namely value of imputed value of unpaid labour, the methodology for estimation will be defined during the present year and with the support of the National Institute for Statistics.

Employment variables, such as FTE will be estimated in accordance with Study Fish/2005/14.

During 2011, it will be collected and produced data for reference year 2010 and 2009. This data, in a final and validated form, will be available by the end of 2011. From 2012 on, data for year n will be collected and treated during year n+1 and their availability will be assure at the end of year n+2.

##### **(b) Type of data collection**

Portugal pursuant to former data collection regulation, has started during 2005, an annual operation for the collection of economic data on processing industry.

Due to the small number of enterprises engaged in the activity, it was considered as best approach to run a census-like operation. Four operations were launched in each calendar year - 2006, 2007, 2008 and 2009 - in order to collect information on the previous year. Inquiries were sent by mail and complementary contacts were undertaken via telephone. Despite of the small universe and the straight contact, Portuguese administration never succeeded in getting a total rate of answers coverage.

Following new universe definitions, enterprises with processing industry as main activity, the Portuguese administration is developing work together with INE, to support the production of estimates for processing industry sector based on the framework of other statistic operations, such as the National Accounts Project.

#### **(c) Target and frame population**

Target population is the same as frame population, and consist of all enterprises whose main activity is defined under NACE Code 10.20. Pursuant guidelines from Commission Decision, for enterprises that carry out fish processing but not as main activity, and for 2011, the first programming year, it will be defined a second population in order to estimate both the number and the turnover attributed to this activity.

For reference year 2010, will be collected the number of enterprises with processing activity as a secondary activity and the income attributed to fish processing.

#### **(d) Data sources**

Data Sources are National Accounts and Annual Survey of Industrial Production (Prodcom Survey) from responsibility of INE.

#### **(e) Sampling stratification and allocation scheme**

Not applicable.

### **IV.B.3 Data quality**

Data quality is assured by methodological procedures defined by INE, the organism in charge for both operations.

### **IV.B.4 Data presentation**

Data for year  $n$ , will be available to the end-user at year  $n+2$ .

### **IV.B.5 Regional coordination**

Not applicable.

#### **IV.B.6 Derogations and non-conformities**

Not applicable.

#### **V. Module of evaluation of the effects of the fishing sector on the marine ecosystem**

**The indicators 1, 2, 3 and 4 – Conservation status of fish species, Proportion of large fish, Mean maximum length of fishes and Size at maturation of exploited fish species,** will be collected in all research surveys in order to analyse if they are or not warrantable. For all representative surveys the following procedures will be observed:

**1 - Conservation status of fish species**

Every haul catch has to be sorted by species, taxonomically identified to ensure every species is well reported. All species should be length measured and weighed.

**2 - Proportion of large fish**

This indicator measures the proportion of large fish by weight in the area or assemblage reflecting the size structure and life history composition of the fish community. This implies monitoring by a research survey during the adult spawning season.

**3 - Mean Maximum length of fishes**

This indicator synthesizes the life history composition and can be obtained by summing all fish lengths obtained by survey and require surveys conducted annually during the adult spawning season.

**4 - Size at maturation of exploited fish species**

Individual measurements of age, length, sex and maturity during the adult spawning season will be done during the annual research surveys in the marine region of Portugal.

Indicators 1-3 require that fishery independent research survey cover the largest proportion of the marine region of Portugal (on shelf and also on the slope) over the longest available period with a standard gear suitable for catching from benthonic to pelagic fish. For this purpose IPIMAR started to carry out during the spawning season a pilot research survey “Groundfish Survey for Hake, PESCADA-BD” from March 2004 to March 2008. But unfortunately in 2008 this survey was decided to not be financed by the DCR. This decision makes available only four years of data to estimate the indicators 1 to 3 in the adequate season.

The Western IBTS 4<sup>th</sup> quarter survey (September/October) survey was planned to estimate year-class strength and is therefore carried out for juvenile abundance during the recruitment season during the shelf.

Some of indicators 1-3 were already analysed and estimated based on this available longest October recruitment survey (Bianchi *et al.*), and given that the data show highly recruitment variability of most of the species and only a small proportion of adults are present in the survey in the shelf area, it seems that the October survey series is not appropriate to be used as representing the status of the ecosystem.

Therefore at present we have only conditions to estimate indicators 1-3 from the 4 years of availability of March, the indicator 4 can be estimated with both March and October survey series.

### **Indicators 5, 6 and 7 - Distribution of fishing activities, Aggregation of fishing activities and Areas not impacted by mobile bottom gears**

The Portuguese Fisheries Monitor Centre (FMC) is located in DGPA. VMS data for all the Portuguese fleet is managed by FMC. Due to integrity and confidentiality issues, data analyses and the estimation of the indicators will be managed by DGPA. At the present, this information is stored in two different databases, the former one in MONICAP/SIFICAP system and the other in SI2P.

Information from VMS is available for each two hour period, and Portuguese administration doesn't intend, to enlarge the number of daily communications.

During 2009, Portugal have developed for the fleet operating in Indian Ocean some tools to allow cross information by vessel, trip and day from VMS and logbooks. These tools will be refined during 2010 enabling from 2011 on, the production of the ecosystem indicators 5, 6 and 7, for all the vessels larger than 15 meters, and every fisheries. The unit of observation and classification will be the day of operation.

For each day, depending on the gear used, it will be defined the metier classification and therefore, the correspondent VMS information will also be associated with that same metier. Spatial resolution will be accordingly with Appendix II of Commission Decision. Temporal resolution will be the month.

### **Indicator 8 – Discards rates per *metiers***

To estimate the discard rates *per metier* it will be used the methodology defined in the PGCCDBS meeting in 2003: Final Report of the Workshop on Discard Sampling Methodology and Raising Procedures. DIFRES, Charlottenlund, Denmark.

### **Indicator 9 - Fuel efficiency of fish capture**

Following orientation laid out by the Commission Decision 2010/93/UE, Annex XIII point 9, the estimation of the present indicator will be based on data already produced.

Value of landings, total and per commercial species, produced in accordance with table XX (section III.F)

Fuel consumption (value) – Economic data for Portuguese fleet will be produced annually. Quarterly estimates of fuel consumption per metier will be produced as a derivate variable. Fuel consumption by quarter and metier, will be obtained as a proportion of the total effort days spent by metier and quarter in relation to the total fleet segment and year.

## **VI. Module for management and use of the data**

### **VI.A Management**

At the moment, primary fisheries data, whether transversal, economic or biological, is scattered among the different databases standing in the five institutions engaged in the present Programme. This is as follows:

#### Transversal and Economic data

- Mainland fleet and Enterprises - Fisheries Integrated Information System (SI2P). This database is located in the General Directorate for Fisheries and Aquaculture. It comprehends all primary data for Mainland fleet, such as landings, fishing logbooks and fleet registry data. The fleet registry also includes data for both Mainland and Autonomous Regions. Economic data for Mainland based fleet and processing industry are located in a MySql database, running on a LINUX server.
- Autonomous Regions for Azores fleet and Enterprises
- Autonomous Regions for Madeira fleet and Enterprises

#### Biological data

- Scientific Information System (SIC) – the scientific/biological data for Mainland in this database is located in IPIMAR. This Information System is a new development derived from the previous database PNAB (National Program of Biological Sampling);
- DOP database – for the scientific/biological data for the Azores (R.A.A.);
- Madeira's (R.A.M.) database – information collected in the Autonomous Region of Madeira has been recorded in temporary databases.

Mechanisms for quality control assessment and validation procedures are nowadays executed in each one of the institutions previously referred.

In terms of transversal variables, the crosscheck foreseen under the context of control is such that all the data sources, logbook, landing declaration, sales notes and T2M documents, became targets of several routine procedures that assure the consistency of all data.

For variables surveyed under DCR umbrella, such as small scale fleet effort, fleet economic data, processing industry and aquaculture, the development of quality control survey is foreseen, from 2009 on, in order to assure the outlined standards.

Until 2009, quality control is performed using the suitable statistical procedures to assess estimates precision.

A more precise description is as follows:

#### **IPIMAR/Biological Data/Mainland**

Div.IXa and NAFO areas

IPIMAR has three separated databases which hold primary data collected during sampling of commercial fisheries at harbours landings, fishery catches and discards sampled at sea and biological sampling for stock-based variables (PNAB DB) and the primary data collected during the different type of surveys (CRUZDEM and ZOOPLANKTON).

- The National Sampling Programme (PNAB) for samples and inquiries (those ones mainly directed to artisanal fleets) holds primary data on species length frequencies collected in the harbours at the trip level. As required from the metier based sampling programme, this information is since 2009 collected at the vessel trip level. This situation forced to do some modifications in this database which is still in progress; another dataset consists of information on biological parameters collected for each stock listed in table III.E.2. This data holds, for each individual sampled fish, information on length, weight, sex, maturity and age. Finally, the discard data holds primary data on species catches and length frequencies of discarded and retained fish recorded at sea, at the resolution of individual hauls and weight and age data for individual sampled fish. In addition, details of vessels, gear, fishing operation, area, etc., are also maintained in the database.
- The ZOOPLANKTON database, still in progress, holds primary data from the eggs surveys, like technical data from the cruises (number, date, ship identification, cruise type), station information (location, sampling gear) and samples data (water temperature and salinity, chlorophyll, eggs identification and staging, etc.)
- The CRUZDEM database holds primary data from demersal and crustacean bottom trawl surveys, namely, hauls data, species composition by haul (in number and weight), length composition for most of fish, crustacean and mollusc species, as well as biological data for the most important commercial species. In addition, details of vessels, gear, fishing operation, area, etc., are also maintained in the database.

All databases mentioned above have different levels of assessment and a database administrator. All this data is stored in Oracle® Application Server™ 10g, and accessed with custom applications written mostly in Oracle® SQL Developer™ and interfaces created with Microsoft® Access™.

Further development of the IPIMAR databases are programmed in order to improve the outputs of aggregated data, raised data and other calls of data from the EU.

### **DOP/Biological and Transversal Data/ Autonomous Region of Azores**

DOP/UAc has three separate databases which hold primary data collected during sampling of commercial fisheries at harbors, discards and fishery catches sampled at sea and biological sampling for stock-based variables:

- The Regional Programme for samples and inquiries (PRAI) holds primary data on species length frequencies collected in the harbors at the trip level by staff of DOP/UAc as well as primary data on fishing effort inquiries conducted by the same staff during landing. As required from the metier based sampling programme, this information is since 2009 collected at the vessel trip level. This situation forced to do some modifications in this database which is still in progress;
- Another database consists of information on biological parameters collected for each stock listed in table III.E.2. This database holds, for each individual sampled fish, information on length, weight, sex, maturity and age;
- The discard database holds primary data on species catches and length frequencies of discarded and retained fish recorded at sea by DOP/UAc staff at the resolution of

individual hauls and weight and age data for individual sampled fish. In addition, details of vessels, gear, fishing operation, area, etc., are also maintained in this database.

All databases mentioned above have different levels of assessment and a database administrator is in charge of checking for inputs on a regular interval for range data and sum cross checks. All this data is stored in MS SQL Server 2005, and accessed with custom applications written mostly in MS Visual FoxPro and MS Visual Studio 2005, C#. Further development of the DOP/UAc databases are programmed in order to improve the outputs of aggregated data, raised data and other calls of data from the EU.

### **DRPM/Biological/Transversal and Economic data**

DRPM data are stored in two main Databases, one including the fleet registers, logbooks and daily landings in local fishing harbours and another one holding biological samplings on species landed at the trip level and discard information collected by observers on board.

The Biological Database holds primary data on species length frequencies and biological samplings for stock-based variables for species listed in Table III.E.2 (length, weight, sex maturity and age). Information on fishing effort is usually obtained through inquiries made during the samplings at the vessel trip level.

As required from the metier based sampling programme, this information is collected at the trip level, which implied some reorganization and improvements in the data base that is still in progress, in order to give accurate outputs of aggregated data, raised data and other sort of data to National and EU data calls.

### **VI. B Use of the data**

All the sets of data used to support scientific analysis in ICES, NAFO, CECAF, ICCAT, IOTC and DG MARE will be organised, analysed and presented in those *fora* as usually and in others scientific forums.

The DCF funds includes staff time for data inputs, quality of data, data processing, data retrieval and production of aggregated data for the ICES assessment working groups. Staff time to scientific analysis of that data was also included.

A list with the MS participation and possible contributions to the different meetings is presented in Table II.B.1.

### **VII. Follow-up of STECF recommendations**

All the recommendations applicable to Portugal were carried out.

SOURCE	RECOMMENDATION	FOLLOW UP
SGRN 09-01 (Evaluation of NP proposals 2009-10)	<b>ON DEROGATIONS FOR DISCARDS AND LANDING SAMPLING</b> SGRN consider that derogations can only be	Requests for derogations by Portugal are considering this aspect, but also take into account high costs

	granted if the level of discard is statistically proven and supported by documentation.	requirements in the particular case of DRB_MOL_30_0_0
SGRN 09-01 (Evaluation of NP proposals 2009-10)	<b>ON SPECIES DEROGATIONS AND NON CONFORMITIES</b>  Species derogations can be granted on the basis of less than 200 tons in total landing, if there is not any different provision from relevant RFMO. However, when official references such as EUROSTAT reveal inconsistencies, the derogation cannot be evaluated on the basis of the EU total landing. MS should provide these data so the derogation can be evaluated. SGRN suggests MS to provide a cost/benefit analysis in detail to determine the excessive cost as mentioned in the NP.	Portugal has provided detailed landings data, including stocks for which <200 ton were landed.
SGRN 09-01 (Evaluation of NP proposals 2009-10)	<b>ON SAMPLING IN DISTANT AREAS</b>  SGRN underlines that all target species concerned and all species for which it is mandatory to collect data according to the provision of the RFMO concerned, must be included in the NP of each MS concerned.	Sampling of long-distance fisheries has strongly been considered by Portugal in the appropriate sections.

### VIII. List of derogations

<i>Short title of derogation</i>	<i>NP Proposal section</i>	<i>Derogation approved or rejected<sup>1</sup></i>	<i>Year of approval or rejection of past requests for derogations</i>
<b>Request for derogation on sampling stocks</b>	<b>III.E</b>	<b>a</b>	<b>2002 - 2007</b>
<b>Financial position(small scale fisheries) – Debt/asset ratio</b>	<b>III.B.6</b>	a	<b>2002-2008 2009-2010</b>
<b>Selected stocks to derogation</b>	<b>III.E.1</b>		
<b>Request for derogation on biological - metier-related variables</b>	<b>III.C</b>		<b>2009/2010</b>
<b>Request for derogation on biological -</b>	<b>III.E</b>		<b>2008/2009</b>

<b>stock-related variables</b>			
<b>Economic Data for Aquaculture</b>	<b>IV.A</b>	<b>a</b>	<b>2009-2010</b>
<b>Evaluation Effect Ecosystem-Ind.5,6,7</b>	<b>V</b>	<b>a</b>	<b>2009-2010</b>
<b>Biological – Recreational Fisheries</b>	<b>III.D.4</b>	<b>a</b>	<b>2009-2010</b>

*1 Insert 'a' for approved or 'r' for rejected*

## **IX. List of acronyms and abbreviations**

BNDP	Base Nacional de Dados da Pesca
CE	Comunidade Europeia
CECAF	Committee for the Eastern Central Atlantic Fisheries
CV	Coefficiente de variação
DGPA	Direcção Geral das Pescas e Aquicultura
DOP	Departamento de Oceanografia e Pescas da Universidade dos Açores
DRPA	Direcção Regional das Pescas dos Açores
DRPM	Direcção Regional das Pescas da Madeira
IBTSWG	International Bottom Trawl Survey Working Group
ICCAT	International Commission for the Conservation of Atlantic Tunas
ICES	International Council for the Exploration of the Sea
IPIMAR	Instituto de Investigação das Pescas e do Mar (equal to INRB/L-IPIMAR)
IOTC	Indian Ocean Tuna Commission
NAFO	Northwest Atlantic Fisheries Organization
NP	National Programme
NUTS	Nomenclatura de Unidades Territoriais
PGCCDBS	Planning Group on Commercial Catch, Discards and Biological Sampling
PN2002	National Programme 2002
NP2003	National Programme 2003
NP2004	National Programme 2004
NP2005	National Programme 2005
PNAB	Programa Nacional de Amostragem Biológica
RAA	Região Autónoma dos Açores
RAM	Região Autónoma da Madeira
	Working Group on Acoustic and Egg surveys for sardine and Anchovy in ICES Areas
WGACEGG	VIII and IX
UAç	Universidade dos Açores
WGMEGS	ICES Working Group on Mackerel and Horse Mackerel Egg Surveys

## **X. Comments, suggestions and reflections**

## **XI. References**

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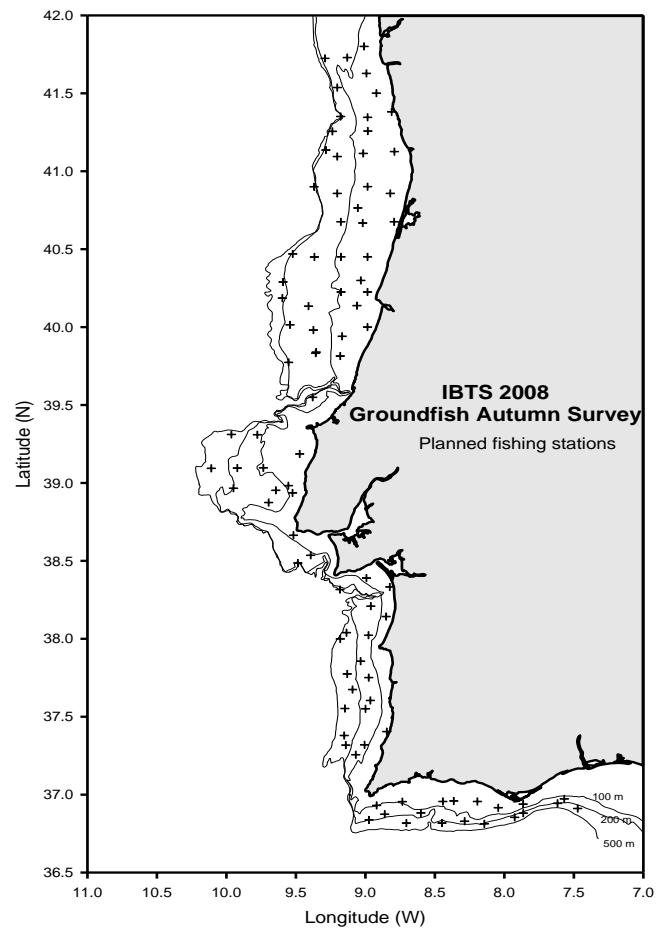
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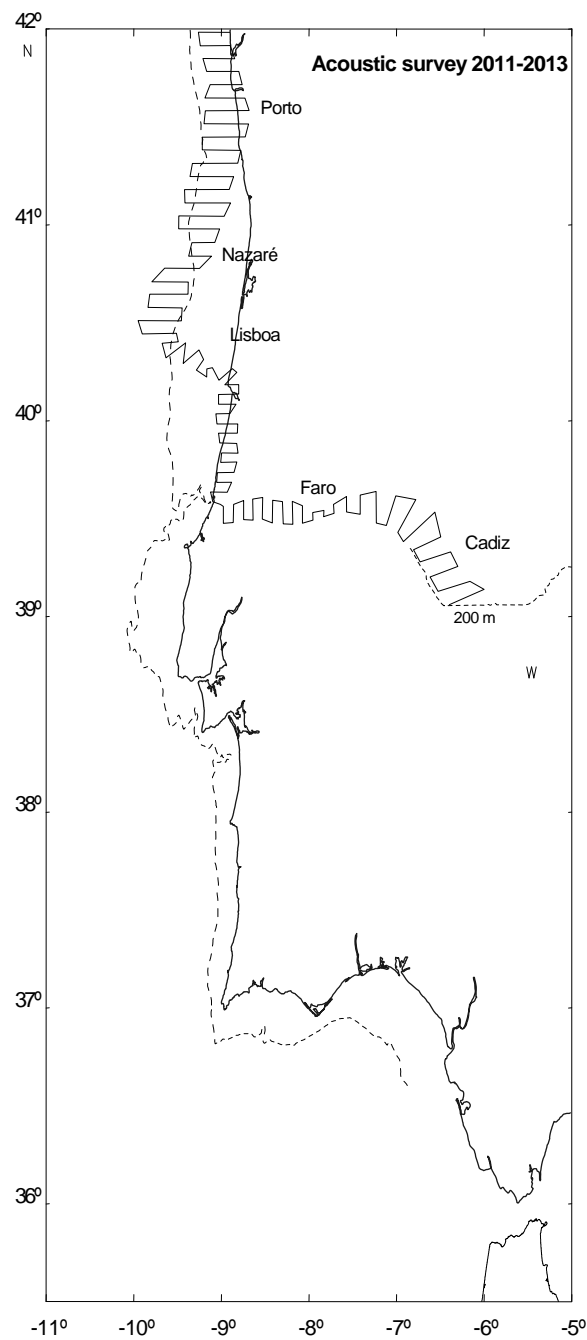
## **XII. Annexes**

**ANNEX I**  
**Surveys Maps**

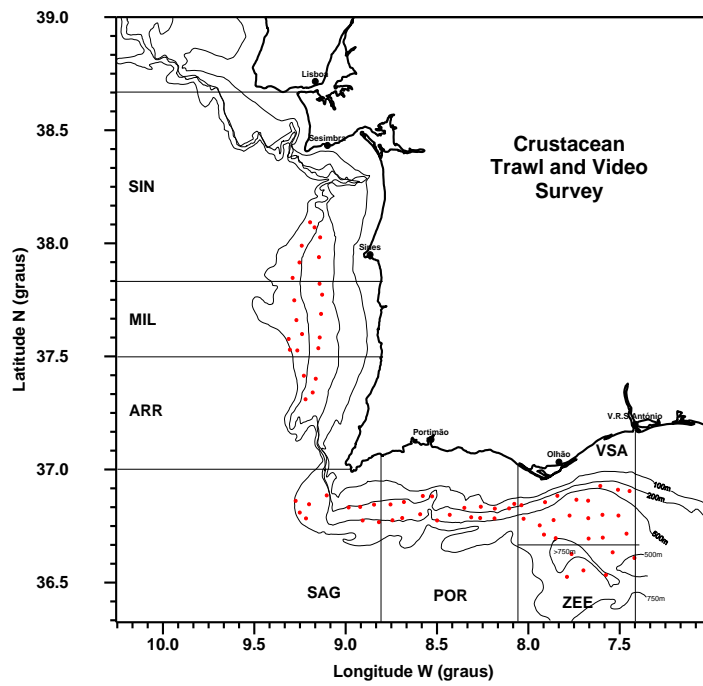
Map 1 – Planned fishing hauls in **Western IBTS survey in Div IX a** (Portuguese waters) in 4<sup>th</sup> Quarter, in **2011-2013**



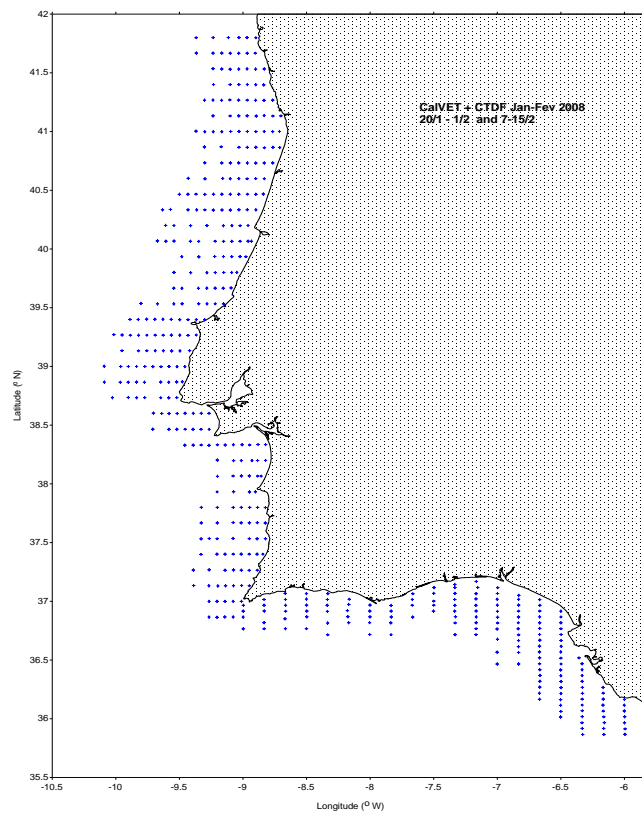
Map 2 - Sampling grid (radials) for Sardine, Anchovy and Horse Mackerel Acoustic Surveys  
(March/April) in **2011-2013**



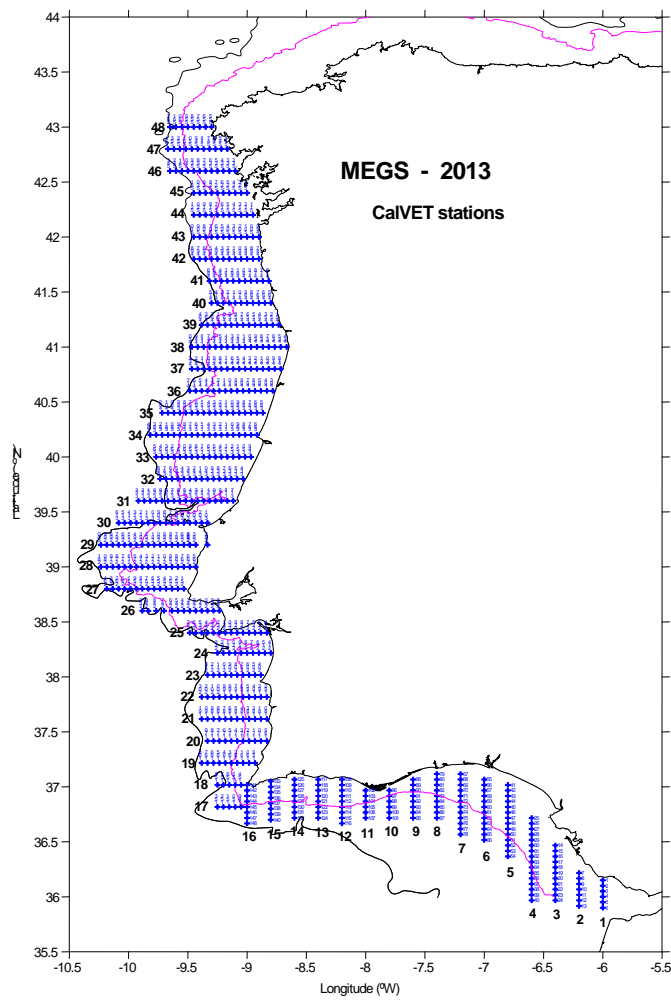
Map 3 – Planned fishing hauls and video footage of the **Nephrops TV survey** - offshore of  
**Portugal – FU 28+29 - in 2011-2013**



Map 4 – Planned Plankton grid (CALVET) for the **Sardine DEPM** survey in 2011



Map 5 – Planned plankton grid for the International Mackerel and Horse Mackerel Eggs survey – **MEGS in 2013**



## **ANNEX II**

### **PILOT STUDIES**

**(IPIMAR)**

- **Pilot Study on the métiers where skates are caught in IXa**
- **Pilot study for glass eel (*Anguilla anguilla*), 2011-2013**

### **Pilot Study on the métiers where skates are caught in IXa**

Portugal is including a pilot study on the artisanal fisheries catching skates in areas of the continental coast (ICES Subarea IXa). The most important ports, where landings of skates take place, were identified during a previous study and estimators to determine specific composition of skate's landings were developed (Bordalo-Machado *et al.*, 2004). Peniche (centre of Portugal) is the main landing port for skates and as far as it is known, no directed fisheries are taking place. Skates in Peniche are by-catch species from landings of the mixed artisanal fleet, particularly from the fleet segment of vessels operating with trammel nets and gill nets. The fishing regime of those vessels is highly variable both temporally and spatially and not fully known.

This proposal came in response to the recent Council Regulation (EC No 43/2009) which prohibits the landings of *Raja undulata*, *Dipturus batis* and *Rostroraja alba* in Iberian waters (ICES subareas IXa and VIII). This decision is considered controversial because there is not enough information or evidence of declines in the populations of these species in the subareas mentioned (ICES 2009). Furthermore the socio-economic impact of this regulation has not been evaluated. The 2009 ICES WGEF report of 2009 recommended *that in order to register possible changes that might occur in the specific composition of landings of these species, this methodology should be improved with a more intensive and effective sampling in ports*. The RCM for the North Atlantic (Cadiz, September 2009), considered that studies, with the purpose of improving the knowledge of a given fishery, is within the scope of DCF, and recommended its inclusion as a pilot study in the National Plan of the Member States involved.

The main objective of the proposal is to improve the knowledge on the métiers where skates are caught, filling the gaps in existing basic data on the métiers, e.g. skates fishing effort and economic aspects and on the biology of rajidae species. This pilot study was designed for three years and during the first year focus will be put only Peniche landing port. In the second and third years and based on the results obtained during the first year will be extended to the other landing ports at the north and south of Portugal. This presupposes adaptation of sampling design in order to accommodate the study of the fisheries from the métiers catching skates as by catch. This pilot study will be developed in Portugal but its conception, goal and data analysis will be performed in a close collaboration with Spain,

which is also submitting a similar proposal for their Atlantic waters (ICES Subarea ICES VIIIb, VIIIc and IXa). Such joint approach will constitute an important contribution for the future stock assessment of skates at Iberian Eco-region.

The terms of the study will be subdivided in two categories:

**a) Fishery:**

- a. Revisions and up to date of historical landings data (i.e. landed weight and value), according to the specific composition of rays by month, métier and geographical distribution.
- b. Characterization of the fleet landing skates and discards.
- c. Standardised effort and CPUE by month by specie.
- d. Preparation of a Guide of Rays in Iberian waters, in cooperation with Spain (Spanish, Portuguese and English versions)

**b) Biological.**

- a. Obtaining of length frequencies, sex proportion and maturity determination for all rajidae species. Besides the studies referred before, under the present proposal, studies will be initiated on age/growth and on reproduction for the species *Raja brachyura*, *Raja undulata* and *Rostroraja alba*, the later are a rare species in Portuguese landings.
- b. Description of condition of landings by port and métier.
- c. Estimation of conversion factors (wing/total weight ratios by specie).

The cost of the pilot study on the artisanal mixed fishery with skates landings is put at EUR 105 476. The main items of expenditure are personnel (a PhD researcher will be recruited to lead the study under the supervision of an experienced researcher) and missions (travel expenses to the landing port and daily allowance). Skate samples and consumables for biological studies of the aforementioned species will be obtained under the DFC routine sampling programme.

<b>Budget Pilot study on skates fishery</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>
<b>Human Resources</b>	18.967 €	18.967 €	18.967 €
Post-doc grant	17.940 €	17.940 €	17.940 €
Other costs - social security	1.027 €	1.027 €	1.027 €
<b>Missions</b>	10.176 €	19.200 €	19.200 €
Travel to landing ports (Peniche = 4 missions/month)	3.600 €	3.600 €	3.600 €
Travel to landing ports (Matosinhos/Olhão=2 missions/month)	2.160 €	2.160 €	2.160 €
Travel expenses (to Peniche, 230 km)	4.416 €	4.416 €	4.416 €
Travel expenses (to Matosinhos, 680 km)		3.264 €	3.264 €
Travel expenses (to Olhão, 600 km)		2.880 €	2.880 €
Hotel Matosinhos/Olhão (2 day/person)		2.880 €	2.880 €
<b>TOTAL (2011)</b>	<b>29.143 €</b>	<b>38.167 €</b>	<b>38.167 €</b>
<b>TOTAL (2011-2013)</b>	<b>105.476 €</b>		

### Pilot study for glass eel (*Anguilla anguilla*), 2011-2013

Recruitment of glass eel is at a historically low level and continues to decline with no signs of recovery across Europe. All glass eel recruitment series available from NW Europe demonstrate a clear decline since the early 1980s. Although Portugal is considered one of the most important countries with respect to recruitment of glass eel, just after France and Spain, there are no reliable historical data on glass eel relative abundance. The only time series available comes from fishery data in Minho River, the only river where glass eel fishing is still legally allowed... As can be seen from the tabulated values (Table I), landing trends in Minho river are similar to what observed in the rest of Europe.

Table I. Official data of Portuguese glass eel landings in Minho River (source: Capitania do Porto de Caminha)

Season	Catch (kg)	Season	Catch (kg)	Season	Catch (kg)
1979/80	10110	1989/90	4485	1999/00	3000
1980/81	18050	1990/91	2800	2000/01	1149
1981/82	22235	1991/92	4471	2001/02	804
1982/83	6740	1992/93	3626	2002/03	1443
1983/84	16064	1993/94	2900	2003/04	814
1984/85	14843	1994/95	5300	2004/05	1174
1985/86	7000	1995/96	8700	2005/06	2736
1986/87	9510	1996/97	4440	2006/07	905
1987/88	2571	1997/98	4460	2007/08	750
1988/89	2834	1998/99	3600	2008/09	1350

Apart from the Minho river (international river at the northern border with Spain), glass eel fishing is forbidden in the rest of Portugal since 2001. However, an important illegal activity continues to take place, catching many tonnes of glass eels annually.

With the implementation of the National Eel Management Plans according to the EU Regulation (CE) 1100/2007, eel recruitment monitoring is a key element for the evaluation of the measures adopted for the recovery of the stock of European eel. Although several European countries have already established recruitment monitoring programmes, in Portugal currently does not exist such monitoring. The proposal of this pilot study aims to establish the basis for a future sampling plan that monitors eel recruitment in Portugal and therefore permits the evaluation of the efficiency of the stock recovery measures currently being set in place.

**Objective:** initiate a monitoring plan to evaluate seasonal variation and interannual trends of glass eel recruitment based on CPUEs in two distinct riverine systems of Portugal

### **Working plan**

To fulfil the pilot project objectives, the sampling activity will be concentrated in two areas:

- Minho river, the only national river where there is a legal commercial activity with the existence of an historical series of data;
- Lis river, a small river where IPIMAR in the 90s conducted work, thus having some reference data of relative glass eel abundance (CPUEs) which can be compared with current data (in Lis side tributaries, glass eel fishing can be conducted in an easy way not requiring a vessel).

The sampling plan during 2011-2013 will include:

#### Minho river

- preliminary visits to establish relations with the fishermen and describe the local fishing gear, *tela*;
- introduction of a voluntary logbook to be filled-in by fishermen;
- weekly contacts by telephone and visits every month;

- monthly purchase of glass eel samples to determine biological characteristics: length, weight, pigmentation stage.

#### Lis river

- preliminary visits to establish relations, contract fishermen and describe the local fishing gear, *sarrico*;
- four-monthly fishing (October-May) to evaluate abundance in terms of CPUE and seasonal trends of recruitment;
- laboratory determination of length, weight and pigmentation stage

#### **Budget (2011 and 2011-2013)**

<b>Activity</b>	<b>Cost (€) 1year</b>	<b>Description</b>
Fishing (sub-contract)	8000	4 nights by month, 8 months/year ( <b>Lis river</b> ) (2011-2013 = 24000 €)
Travel	4000	Minho and Lis rivers (3years = 12000 €)
Fish samples	2400	6 months samples/Year ( <b>Minho river</b> ) (3 years = 7200 €)
<b>Total 2011</b>	<b>14400</b>	
<b>Total 2011 - 2013</b>	<b>43200</b>	

## ANNEX III

### SAMPLING METHODOLOGY FOR SMALL SCALE FISHERIES

#### 1. Definition of sample

For sample definition 3 independent subpopulations were considered. The distinction between each subpopulation consists on fishing gears taken on board. In this way the following groups had been created: vessels using active gears, vessels using passive gears and vessels using polyvalent gears.

The sample size of each subpopulation,  $n$ , was determined using the following formula (Thompson S., 1992) for a fixed precision level<sup>1</sup>,  $r = 0,05$ :

$$n = \frac{1}{\frac{r^2}{Z^2 \gamma^2} + \frac{1}{N}}$$

Where:

$N$  = population size;

$n$  = sample size;

$r$  = relative precision level;

$Z$  = Standardized variable;

$\gamma$  = coefficient of variation of the population.

#### 2. Stratification and division of sample

The sample was distributed among the relevant strata with the principal objective of minimising the sampling error to be obtained for the stratification variable and in accordance with the fishing gears licenses and operation area. The strata had been defined taking in account the recommendations of

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<sup>1</sup> For each subpopulation was used the coefficient of variation of respective fishing effort for the period between January and December of 2005.

the *Instituto Nacional de Investigação Agrária e das Pescas (INIAP/IPIMAR)* and the *PECOSUDE* document of the European Commission (Léauté & Caill-Milly, 2002).

Following the referred recommendations certain fishing gears had been considered predominant for determined regions, creating, by itself, strata.

The subpopulation of polyvalent vessels was divided in polyvalent with and without beam trawl. The subpopulation of vessels using passive gears was disaggregated in four initial strata: vessels using pots and traps, netters, vessels using hooks and vessels with passive polyvalent gears. This last strata was subdivided: vessels using passive polyvalent gears with *sombreira* and the remaining vessels were grouped by: vessels using passive polyvalent gears with gillnets, vessels using passive polyvalent gears with trammel nets, vessels using passive polyvalent gears with trammel and gillnets and vessels using passive polyvalent gears with hooks, pots and traps.

The subpopulation of vessels using active gears was disaggregated in: beam trawlers, bottom trawlers, seiners, dredgers, vessels using *xávega* gear and vessels using active polyvalent gears.

### 3. Sample selection

The sample distribution within strata was carried through the Proportional Probability to Size (PPS) cluster sampling method which allows maintain a steady sampling fraction throughout the population. If stratum  $h$  has  $N_h$  units, the sample size allocated,  $n_h$ , to it would be:

$$n_h = \frac{N_h}{N} n$$

The serial number of the units in each stratum  $h$  was given by a computer-generated random number. The serial numbers of the units selected for the sample are obtained from the first  $n_h$  serial numbers given to each stratum  $h$ .

### 4. Estimating the population total

An unbiased estimator is used to estimate the population total:

$$\hat{\tau} = N\bar{y} = \frac{N}{n} \sum_{i=1}^n y_i$$

Where:

$N$  = population size;

$n$  = sample size;

$\bar{y}$  = sample mean

An unbiased estimator of variance is:

$$\widehat{var}(\tau) = N^2 \widehat{var}(\bar{y}) = \frac{N(N-n)s^2}{n}$$

Where:

$s^2$  = sample variance;

N = population size;

n = sample size;


$\bar{y}$  = sample mean

This estimator is used to estimate the following effort variables:

- Number of rigs
- Number of fishing operations
- Number of nets / Length
- Number of hooks, Number of lines
- Numbers of pots, traps
- Soaking time
- Hours fished

REGION	VESSELS LICENSED TO OPERATE EXCLUSIVELY AT THE SEA												
	ACTIVE GEARs	PASSIVE GEARs									POLYVALENT		
	Xávega	Hooks	Nets	Polyvalent passive							With Dredger	Without Dredger	
				Without <i>Sombreira</i>						With <i>Sombreira</i>		Without Beam Trawl	With Beam Trawl
				Hooks Traps	With Trammel nets	With Gillnets	With Gillnets and Trammel nets	With Gillnets or Trammel nets	Nets				
North	16			10			109	33		66		59	18
Center								29			14		
Lisbon and Tagus Valley	22	106	14	52	76	78	111						20
Alentejo		15		19		29			34				
Algarve		81	34	169	67	117	220				38		19

REGION	VESSELS LICENSED TO OPERAT AT THE SEA AND INLAND WATERS									
	PASSIVE GEARS								POLYVALENT	
	Hooks	Nets	Polivalente Passiva						With Dredger	Without Dredger
			Hooks and Traps	With Trammel nets	With Gillnets	With Gillnets And Trammel nets	With Gillnets or Trammel nets	Nets		
North				16				18		13
Center				24				30		88
Lisbon and Tagus Valley	33	86	19	58	14	74			21	13
Alentejo										
Algarve	11			40				53		


**INQUÉRITO À PEQUENA PESCA**  
 PROGRAMA NACIONAL DE REGISTO DA  
 DE GADOS DA PESCA

ID:

## BOLETIM DE REGISTO DA ACTIVIDADE

VIAGEM →

Data

Porto

ARTE →

Rejeições,  
Autoconsumo,  
Isco, Etc

Tempo de Pesca (horas) →

Areeiros	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Badejo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Biqueirão	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Camarão	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Carapau	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Cavala	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Choco Vulgar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Enguia Europeia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Escamudo	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Faneca	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Gamba Branca	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Goraz	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Lagostim	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Lavagante	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Linguado	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Lixa	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Lulas	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Pescada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Polvo Vulgar	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Raia de Dois Olhos	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Raia Lenga	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Raia Manchada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Raia Pontuada	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Raias	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Salmonete	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Sapateira	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Sarda	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Sardinha	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Solha	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Tamboril	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Verdinho	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg
Outras	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Kg

Assinale com um X as espécies capturadas com cada uma das artes de pesca utilizadas e indique, em quilograma, as quantidades de cada espécie que não tenham sido vendidas em lota por terem sido rejeitadas, consumidas pela tripulação ou por qualquer outro motivo não especificado.

## FULFILLING FIELDS

(A)	ID	Vessel's statistical code. 5 character alphanumeric code.
(B)	DATE	Fishing date, <i>dd-mm-yyyy</i> .
(C)	PORT	Departure port.
(D)	FISHING GEAR	Fishing gear FAO code.
(E)	FISHING TIME	Fishint time, <i>hh</i> .
(F)	CATCH	Catch presence or absence for the following species: Megrim Whiting European anchovy Pandalus shrimps Atlantic horse mackerel Chub mackerel Common cuttlefish European eel Pollock Pouting Deepwater rose shrimp Blackspot sea bream Norway lobster European lobster Common sole Leafscale gulper shark European squid European hake Common octopus Cuckoo ray Thornback ray Spotted ray Blonde ray

Raja rays  
 West African goatfish  
 Edible crab  
 Atlantic mackerel  
 Sardine  
 European plaice  
 Angler  
 Blue whiting

Associated classification: X –  
 Presence.

**(G)**

**DISCARDS,  
 SELFCONSUMPTION,  
 BAIT, ETC**

Amount of fish discarded, used as  
 bait or for crew consumption.  
 Measuring unit: kilogram.

## ANNEX V

### SAMPLING METHODOLOGY FOR ECONOMIC VARIABLES ON VESSELS > 10 M

#### 1. Definition of sample

The definition of the sample varies according to the universe and type of parameter to be estimated, always taking the precision level defined into account.

##### a. Stratification and division of sample

The size of the sample is obtained in order to achieve a coefficient of variation not superior to 5% to the variable "Income" (reference year n-1) for each stratum. Some strata may be sampled exhaustively if by doing so an improve in the quality of estimates will be achieved.

Substratification may be used in order to obtain more homogeneous strata and further minimize variance and, therefore, decrease the necessary sample size in order to achieve the minimum precision.

Sample is distributed by each strata using the optimum Neyman allocation criteria wich guarantees a minimum variance:

$$n_h = \frac{N_h S_h}{\sum_h N_h S_h} n$$

where:

$h$  stratum index

$n_h$  sample size attributed to stratum  $h$

$n$  overall size of sample

$N_h$  size of universe in stratum  $h$

$S_h$  standard deviation of stratum  $h$  stratification variable

Slight adjustments were subsequently made to the values calculated so as to obtain an equilibrium between sample size and reasonable values for the coefficient of variation associated to each stratum and to guarantee that the size of each strata is not too small.

The coefficient of variation is estimated by:

$$\hat{C.V.}(A) = \frac{\sqrt{\sum_h \hat{\text{var}}(A_h)}}{\sum_h A_h} \times 100$$

In which the variance estimated in each stratum h is given by:

$$\hat{\text{var}}(A_h) = \frac{N_h}{n_h} (N_h - n_h) S_h^2$$

where  $S_h^2$  represents the variance of the stratification variable in the population of stratum h, which is calculated by the formula:

$$S_h^2 = \frac{\sum_{i=1}^{N_h} (a_{hi} - \bar{a}_h)^2}{N_h - 1}$$

where  $\bar{a}_h$  is the average value of the stratification variable of stratum h, given by:

$$\bar{a}_h = \frac{\sum_{i=1}^{N_h} a_{hi}}{N_h}.$$

## 1.2. Selection of sample

The sample will be selected independently in each stratum by a systematic process, with a selection interval determined by the quotient between the size of the universe of the stratum and the size of the sample it is intended to study within it.

The units will be ordered in each stratum, following which a serial number will be attributed to each unit.

The systematic selection interval is given by:

$$I_h = \frac{N_h}{n_h}$$

where  $N_h$  is the size of the universe of the generic stratum h and  $n_h$  is the respective size of the sample.

The serial number NO of the first unit to be selected in each stratum h is given by a computer-generated random number equal to or greater than 1 and less than the value of the systematic selection interval of the stratum concerned.

The serial numbers of the units selected for the sample are obtained by means of the following expression:

$$nord = NO_h + k * I_h$$

where

$$k = 0, 1, \dots, (n_h - 1)$$

## 2. Substitution of the survey unit

The objective of determining substitution rules is to allow one unit to be substituted by another when there is no other alternative, but without breaking the rules of random selection, and respecting the size of the sample.

Data collection of this type envisages units being substituted only in the event of it being impossible to contact the shipowner or someone who can provide the information requested in the collection.

For substitution purposes an extra sample of the same size as the effective sample is always selected in each stratum when possible, and should be used if necessary.

An extra unit should be chosen for the unit of the same stratum, as geographically close as possible to the effective unit to be substituted.

### 3. Data quality evaluation

All the collected data is submitted to a critical view, assured by a technician. Some automatic validations are also made.

The automatic validation distinguish between unplausible but possible situations (warning errors) and incorrect situations (fatal errors). Data with fatal errors is not considered to the estimation process.

Types of rules for the automatic validation subroutines includes:

Algebraic operation rules;

Limitation rules;

Coherence rules between datasets;

Comparison rules between reference year n and n-1.

Data quality analysis begins with the Universe characterization and it will extend to the final distribution to the end users, divided in three phases:

- Universe and sample definition;
- Data collection;
- Data analysis

#### Precision

After closure of the survey the data collected for each vessel is subject to a set of validation rules and is subject to occasional changes.

With respect to sampling errors it should be noted that the generic expression of the relative standard deviation of the estimator of a variable X, in stratum h, for a confidence level of 95,0 % is,

$$E.R.A(\hat{X}_h) = 1.96 \frac{\sqrt{Var(\hat{X}_h)}}{\hat{X}_h}$$

Where  $Var(\hat{X}_h)$  is the variance of estimator  $\hat{X}_h$ , wich is given by,

$$Var(\hat{X}_h) = \frac{N_h}{n_h} (N_h - n_h) s_h^2$$

Where  $s_h^2$  is the variance of the feature X in the sample and is obtained by the expression,

$$s_h^2 = \frac{\sum_{i=1}^{n_h} (x_{hi} - \bar{x}_h)^2}{n_h - 1}$$

Where  $\bar{x}_h$  is the average of X, in the stratum h and is given by,

$$\bar{x}_h = \frac{\sum_{i=1}^{n_h} x_{hi}}{n_h}$$

The sample size was determined to limit the coefficient of variation for the variable income, for the crosses and aggregates of the stratification variables described above.

The coefficient of variation is given by

$$C.V(\hat{X}) = \frac{\sqrt{Var(\hat{X})}}{\hat{X}}$$

Where the variance of the estimator for the Income variable and for the desired aggregation  $\theta$  is obtained by the sum of the variances of the estimator in the strata that constitute it, ie

$$Var(\hat{X}) = \sum_{h \in \theta} Var(\hat{X}_h)$$

### Coherence

The survey data is compared with data recorded in the database SI2P and with publications of fisheries statistics.

## ANNEX - VI

### *National programme for the collection, management and use of data in the fisheries sector for the period 2011-2013*

### INDICATIVE COST OF MULTI-ANNUAL NATIONAL PROGRAMME 2011 - 2013\*

- EURO -

Year	Planned eligible expenditure	Maximum Community contribution
2011	4.289.310,64	2.144.655,32
2012	3.936.834,80	1.968.417,40
2013	4.353.042,85	2.176.521,43
TOTAL	12.579.188,29	6.289.594,14

\* - to be inserted into the National Programme

