

ANNUAL REPORT – 2016

OF THE PORTUGUESE PROGRAMME FOR THE COLLECTION, MANAGEMENT AND USE OF DATA IN THE FISHERIES SECTOR

Under

**Council Regulation (EC) No 199/2008
Commission Regulation (EC) No 665/2008
Commission Decision 2010/93/EU**

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I. General framework

This report gives the results of the Portuguese National Programme (NP) for the collection of fisheries data in 2016 under the *Commission Regulation (665/2008)* and *Commission Decision (2010/93/EC)* adopting a multi annual Community programme pursuant to Council Regulation (EC) No 199/2008 establishing a Community framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the Common Fisheries Policy, hereafter referred to as “DCF”.

The format of this report is structured following the guidelines from the Commission¹. The Annual Report (AR) is structured in a number of modules. In the following chapters a description is given of the activities related to the DCF that have been carried out by Portugal.

Where relevant, reference has been made to the organisation responsible for the information. In the results per area:

- i) The mainland sub-area of the Portuguese EEZ corresponds to ICES Sub-area IX and, when referring to local fishing, to ICES Division IXa.
- ii) The Azores Grounds of the Portuguese EEZ corresponds to ICES Sub-area X.
- iii) The Madeira sub-area of the Portuguese EEZ corresponds to CECAF Division 34.1.2.

A comprehensive and updated list of the derogations valid for 2016 is provided in table I.A.1. There are no bilateral or multilateral agreements in force.

Derogation for sampling 43 required stocks in ICES Sub-area X is also mentioned in table I.A.1. Due to the fact of no fishery occurring in this region and, according to the exceptions rules in the Commission Decision 2010/93/EC, the species for which stock-related variables collection was asked for derogation are: *Anguilla anguilla*, *Argentina spp.*, *Argyrosomus regius*, *Auxis rochei*, *Cancer pagurus*, *Carcharhinus falciformis*, *Centrophorus squamosus*, *Centroscymnus coelolepis*, *Centroscymnus crepidater*, *Cetorhinus maximus*, *Coryphaenoides rupestris*, *Deania calcea*, *Dicentrarchus labrax*, *Euthynnus alletteratus*, *Galeus melastomus*, *Homarus gammarus*, *Hoplostethus atlanticus*, *Istiophoridae*, *Lamna nasus*, *Loligo vulgaris*, *Merlangius merlangus*, *Microchirus variegatus*, *Microstomus kitt*, *Molva molva*, *Myliobatis aquila*, *Pandalus spp.*, *Pleuronectes platessa*, *Pollachius pollachius*, *Psetta maxima*, *Pteroplatytrygon violacea*, *Raja montagui*, *Raja naevus*, *Rajidae*, *Salmo salar*, *Scophthalmus rhombus*, *Sepia officinalis*, *Shark-like Selachii*, *Squalus acanthias*, *Squatina squatina*, *Thunnus albacares*, *Thunnus thynnus*, *Trachurus trachurus* and *Trisopterus spp.*

¹ Guidelines for Submission of Annual Reports on the National Data Collection Programmes under Council Regulation (EC) 199/2008, Commission Regulation (EC) 665/2008 and Commission Decision 2010/93/EU).

II. National data collection organisation

II.A. National correspondent and participating institutes

National Correspondent

The National Correspondent representing Portugal is:

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Participating Institutes

There are five organizations/institutes involved in the planning and implementation of the Portuguese Programme for the Collection of Fisheries Data:

Direcção-Geral dos Recursos Naturais, Segurança e Serviços Marítimos/Directorate General for Natural Resources, Safety and Maritime Services (DGRM)

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DGRM is responsible for gathering the data related with economic variables (fleet, aquaculture and processing industry) and transversal variables in Mainland.

Instituto Português do Mar e da Atmosfera / Portuguese Institute for Sea and Atmosphere (IPMA)

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IPMA is the Portuguese Institute responsible for on-shore and at-sea sampling for the Mainland fleet operating in the Iberian Fishing Ground and exploiting stocks assessed by ICCAT as well as on-board sampling (unsorted catches) for NAFO Areas and North Sea and Eastern Arctic and IOTC. IPMA is also responsible for conducting scientific surveys in the Iberian Fishing Ground and participates on the Flemish Cap Groundfish Survey.

Direcção Regional das Pescas da Região Autónoma dos Açores (RAA)

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

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IMAR/DOP is an Institute of Marine Research within the Department of Oceanography and Fisheries from the University of the Azores which is responsible for the collection of scientific data under the Data Collection Framework, namely Métier and Stock-related variables, and data related to transversal variables (Effort and Landings). IMAR/DOP is also responsible for the provision of scientific advice for the fisheries sector of the Autonomous Region of the Azores.

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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 and Development (DSIDP), which is a branch of the Regional Directorate of Fisheries of Madeira from the Agriculture and Fisheries Secretary of the Regional Government of Madeira.

A website has been established to inform involved partners, the EU Commission and the public about the Portuguese implementation of the EU Data Collection framework in accordance with Commission Regulation (EC) 665/2008 article 8(2). The website is under DGRM webpage (https://www.dgrm.mm.gov.pt/xportal/xmain?xpid=dgrm&selectedmenu=1471687&xpgid=genericPageV2&conteudoDetalhe_v2=1484690).

In 2016, one national co-ordination meeting took place on 30th March, with the participation of all partners. European Commission was invited to attend this meeting as established in article 25.4 of Regulation (EU) nº 1380/2013, of 11 December. The main subjects were:

- Funding through EMFF Information – state of play national legislation
- Annual report (changes and dates)
- Update of Council Regulation 199/2008
- Data collection and meetings in 2016
- EU MAP e PT Working Plan 2017

The meeting report is attached.

II.B. Regional and International coordination

II.B.1. Attendance of international meetings

Table II.B.1. indicates which meetings have been attended by Portuguese representatives during 2016. Portugal has ensured its participation in the relevant meetings and workshops for international co-ordination.

II.B.2. Follow-up of Regional and International Recommendations and agreements

All recommendations and the agreements from the RCMs, Liaison Meeting, STECF and survey planning groups, believed relevant to the AR year and to Portugal are listed in table II.B.2.

III. MODULE OF EVALUATION OF THE FISHING SECTOR

III.A. General Description of the fishing sector

No major changes, which would have an impact on the implementation of the NP, occurred in the fishing sector in 2016.

Table III.A.1 shows a general overview on the Portuguese fisheries activities in 2016 at the mentioned regions and sub-areas. There was no fishing activity in the Baltic Sea and in Other Regions (Antarctic and Central West Atlantic) only tuna and tuna like species fisheries occur.

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, which determines the fishing activity. The sub-area is characterised by a great variety of species, none of which, however is highly abundant. On the Mainland, fishing activity is carried out close to the shore and exploiting a small group of species (namely: chub mackerel, mackerel, sardine, horse mackerel, hake, silver scabbard fish, octopus and clams).

The Autonomous Regions of the Azores and Madeira are characterized by a narrow (or absent) continental shelf. Given their oceanic nature, the fishing fleet tend to distributed through different islands coasts and seamounts which make the Azores and Madeira a particular case in Portuguese fisheries. In the Azores, the blackspot seabream is the most important demersal species, while in Madeira the black scabbard fish is the main species.

The national fishing fleet is extremely diverse, differing between the above zones. This is related to the available resources in each fishing area. It is dominated by small vessels, some of which are open decked. This reflects the primarily artisanal nature of the activity, which is 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. 32 of the main ports are located in Mainland, 11 in the Autonomous Region of the Azores and 2 in the Autonomous Region of Madeira.

Mainland

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

In 2016 the Portuguese fleet operating in the traditional grounds of both Divisions I and II, was composed by 2 trawlers in the métier OTB_DEF_130_0_0. The fishery in the international waters of Div. IIa was carried out by 1 trawler in the pelagic métier OTM_SPF_90-100_0_0.

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

In 2016, the Portuguese nominal catches recorded 4.056 t: 3.292 t proceeding from the Division IIa (Norway) and 764 t proceeding from the Division IIb (Svalbard). Cod (*Gadus morhua*) has been the most important species caught in both areas. In 2016, redfish (*Sebastes mentella*) represented near 1/3 of catches from Division IIa (Norway).

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 and later wide spread till NAFO divisions 1F, 2H, 2J and 3K. In 2016 there was no activity in those areas.

Fishery in the NAFO Area

In 2016, the Portuguese nominal catches proceeding from NAFO Regulatory Area have reached 21.945t Redfish (3O+3M+3LN) was the most caught species by the Portuguese fleet in NAFO Area, representing 49% in 2016 (10.786 t) of the overall catch, followed by Cod (3M), with catches of 6.629 t and Greenland Halibut (3LMNO), with catches of 2.228t.

In 2016 the fishing effort was 1573 fishing days in the métier OTB_DEF_130_0_0, representing more 38 days than in 2015.

Fishery in the Mediterranean and Black Sea

In 2016, there were 2 vessels operating in this area, ranging 167 to 224 GT and using exclusively traps for striped soldier shrimp (*Plesionika edwardsii*). Catches in the métier FPO_CRU_0_0_0 were 116 t and were landed in Italy and Spain.

There was no activity in the Black Sea.

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 (≥ 55 mm mesh size for shrimps and above 70 mm for Norway lobster). In 2016, about 24 vessels operated in the métier OTB_CRU_ $\geq 55_0_0$ and 48 in the métier OTB_DEF_ $\geq 65_0_0$.

The catches of this trawl fishery represents near 18% of the total landed in Div. IXa (Portuguese coast).

The trawl fleet component 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 and during all the year.

The fleet targeting crustaceans (Norway lobster and rose shrimp) operates mainly in the Southwest and South in deeper waters, from 100 to 800 m. This fishery takes place throughout the year, with the highest landings usually being made in the spring and summer.

Artisanal Fishery in Div IXa

The artisanal fishery is composed of a large number (near 3 000 licensed vessels) 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. Some of these boats are licensed for more than one type of gear (with permission to a maximum of five gears) and so called polyvalent vessels.

In some cases it is used several different gears during the same trip and 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, chub mackerel, sardine, horse mackerel from purse seine, hake, conger, skates and black scabardfish 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 GT of 1,5 and an average of 18 KW engine power.

The polyvalent fleet represents 35% and 63% in weight and value, respectively, of the total commercial species sold in mainland auctions in 2016.

Purse-seine fishery in Div IXa

The purse-seine fishery, traditionally the most important in landings volume, is composed of around 148 purse seines operating in the métiers PS_SPF_>=16_0_0 and PS_MPD_0_0_0 with a total catch of 53.926 t, in 2016. This fleet traditionally targeted sardine using a mesh size of 16 mm. With the introduction, in 2012, of specific legislation restricting sardine catches, the importance of this species has been reducing and represented 12% of the landings, in 2016. In 2011, catches of sardine represented 63% of total catches. Sardine catches were replaced by Chub Mackerel, species whose catches increased substantially in importance representing 24% of the landings, in 2016. Other target species are horse mackerel and anchovy.

The black scabbardfish long-line fishery in Div. IXa

In 2016, 21 deep-water longline vessels were routinely targeting the Black scabbard fish (*Aphanopus carbo*) in a limited area (hard grounds along canyon slopes off Sesimbra, South of Lisbon). Landings of Black scabbard fish amounted to 2 456 t. This fishery started in 1983 at Sesimbra port and has a relevant importance to the incomes of fishermen in the region.

The Swordfish Fishery in Atlantic Ocean

There is a drifting longline fishery directed to the swordfish in Atlantic Ocean involving 14 vessels with a mean GT of 110, an average of 260 kW engine power and a mean overall length of 21 meters. The main landing ports for swordfish on mainland west coast are Peniche and Sesimbra.

The Surface Longline Fishery in Indian Ocean

In 2016, the Portuguese longline fishery in Indian Ocean (East and West) comprised 5 vessels with activity in the métier LLD_LPF_0_0_0, ranging from 177 to 602 GT. Target species were Swordfish and Blue shark. This fleet activity's outcome is a total catch of around 3.399 t. From those, about 42% was Swordfish and 38% Blue shark, approximately 1.433 t and 1.298 t, in that order. Catches in the fishing area were landed in Mauritius and South Africa.

The Surface Longline Fishery in Pacific Ocean

In 2016, the Portuguese longline fishery in Pacific Ocean (East and West) comprised by 1 vessel. Target species were Swordfish (SWO) and Blue shark (BSH). This activity's outcome had total landings around 648 t. From those, about 40% was SWO and 40% BSH. Catches were landed in Vigo, Spain, in Suva, Fiji and in Callao, Peru.

Autonomous Region of the Azores (Div. X and CECAF 34.2.0)

The majority of Azorean fishing activity, data collection and sampling are concentrated in the ICES Sub-area X, where vessels are committed to demersal, pelagic, deep-water, tuna and other highly migratory fishes. The ecosystem is a seamount type with fishing operations occurring in all available areas (coastal and seamounts within the Azorean EEZ) usually limited to 1000 m depth, catching species from different assemblages, mostly on the 200-600 m strata (strata where the most commercially important demersal species occur). On the other hand, some vessels may occasionally conduct some fishing operations within the portion of CECAF 34.2.0 that belongs to Azorean EEZ. No sampling scheme is programmed for those catches since they are usually of small amounts and are landed mixed with catches from ICES area X, which are sampled at landing.

Fishing activities in the Autonomous Region of the Azores can be divided into 5 main categories which include ten métiers. During the sampling year, the same vessel can use more than one fishing gear depending on the availability of resources and economic factors. This way, the number of vessels shown below

accounted for total different vessels present at landings using the specified fishing gear and target species or assemblage.

Purse seine fishery for small pelagic fishes

PS_SPF métier consists on the use of purse seine nets targeting juveniles of blue jack mackerel (*T. picturatus*). This fishery occurs at coastal areas all year round. Currently, 39 vessels use this métier; being the 10 – 12m segment the main contributor in terms of landings.

Pole-and-line fishery for large pelagic species

LHP_LPF métier consists on a pole and line gear type targeting tuna species [i.e bigeye tuna (*T. obesus*), skipjack tuna (*K. pelamis*) and albacore (*T. alalunga*)]. Tuna vessels operate from coastal to offshore areas during April to October. Currently, 47 vessels ranging a great variety of overall size use this métier however, the > 24m segment is the main contributor in terms of landings.

Hook fishery for demersal and coastal species

LLS_DEF métier consists on a set longline with a multispecies character targeting a high variety of demersal species as blackspot seabream (*P. bogaraveo*) and bluemouth (*H. dactylopterus*). This gear is used all year round at 3NM from shore comprising the islands slope (> 3MN) and offshore banks. Currently, around 128 vessels use this gear; being the 10 – 12m and 12 – 18m segments the main contributors in terms of landings.

LHP_FIF métier characterizes by handlines gears. Currently, 273 vessels use this métier; being the 0 – 10m segment the main contributor in terms of landings. This gear is used at coastal areas, however, an important component of the fishery also occur at offshore banks. This fishing gear is used all year round targeting demersal species as blackspot seabream (*P. bogaraveo*), red porgy (*P. pagrus*), fork-beard (*P. phycis*), european conger (*C. conger*).

LHP_CEP métier consists on a squid jigging fishing gear being highly selective for its target species *Loligo forbesis*. Currently, 36 vessels use this gear but it's the fleet 0 – 10m and 10 – 12m segments which are the main contributors in terms of landings. Squid fishery occurred in the islands slope, all year round although with a decreasing of effort and catch during the summer months.

LLD_DWS métier characterizes by a drifting bottom longline gear targeting black scabbardfish. This gear is usually used nearby the slope of the islands and the flanks of seamounts. In 2016 this métier was not used by the Azores fleet.

LLD_LPF métier is defined by drift surface longline gear targeting the swordfish (*Xiphias gladius*) and blue shark (*Prionace glauca*). Currently, 13 vessels use this gear, being the fleet 10 - 12m segment, the main contributor in terms of landings.

Fixed netters fishery for coastal species

GNS_FIF métier is defined by gill nets gear targeting finfish. This fishery occurs in inshore areas (at depths of less than 30m) with a marked seasonality (i.e., summer months) targeting mainly the demersal species parrotfish (*Sparisoma cretense*), but also coastal pelagic species (e.g., yellowmouth barracuda, jacks, atlantic bonito). Currently, 59 vessels use this métier; being the 0 – 10m segment the main contributor in terms of landings.

Traps

FPO_FIF and FPO_CRU métiers consist on a trap gear targeting finfish and crustaceans, respectively. Currently, 28 vessels use these gears being the 0 – 10m segment the main contributor in terms of landings.

These fisheries are all inter-related, since the same vessel can use two or more fishing gears. The demersal and tuna fisheries represent a high economic value for the Autonomous Region of the Azores. The deep-water fishery for demersal species in the Azores is a multispecies and multigear fishery, with several types of hooks and lines gears being used by the local fleet. The dynamic of the demersal fishery seems driven by the main target species, the blackspot seabream (*Pagellus bogaraveo*). However, other commercially important species are also landed and the target species seems to change seasonally according to abundance, species vulnerability, management policies and market demands. The fishery is clearly a typical small-scale one, predominating small vessels (vessels <12m represent 90% of the total fleet) using mainly traditional bottom longline and several types of hand lines.

In 2016 statistical information on fish landings shows a decreased of 30.6% in landings from the Autonomous Region of the Azores when compared to 2015. This tendency was mainly driven by the reduction in the tuna catches, which diminished by almost 59.2% however, an important reduction of demersal species landings from set longline (18.3%), together with small decrease of several métiers reflects the overall landings drop of 2016.

Autonomous Region of Madeira (CECAF 34.1.2)

The bio-geographical conditions of the archipelago of Madeira, e.g. narrow 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 inside the Madeira Economic Exclusive Zone (CECAF 34.1.2), to concentrate on exploiting deepwater and/or migratory resources.

The greater relative weight in this sector belongs to the mixed fishery of two sympatric species black scabbard fish *Aphanopus carbo* (Lowe, 1839) and the intermediate scabbard fish *A. intermedius* Parin, 1983. These benthopelagic species are captured with drifting long lines at meso and bathypelagic zones. Also important are 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), bigeye 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), caught by purse seiners, out of a total of a hundred marine species commercially exploited in this region.

Despite their small commercial importance when compared to the species mentioned above, the demersal 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 multispecific techniques by a number of small boats mostly operating with bottom long lines, traps and hand lines.

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 subtidal zone.

The Madeira fisheries sector does not comprise any industrial fishery targeting species for the production of fish meal, fish oil, etc.

Hook fishery for deep species

LLD_DWF_0_0_0 This métier comprises the very specialized Madeira fishery of the black scabbard fish (*Aphanopus carbo* and *A. intermedius*), exclusively performed with drifting long lines (LLD), set at the water column between 800-1300 m deep. Catches of this métier 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. Recently, we registered a displacement of some units of the fleet towards fishing grounds off Canarias and seamounts located at the South of the Azores ZEE. This métier comprises around 18 active fishing vessels, mostly between 12-18 m.

Pole-and-line fishery for large pelagic species

LHP_LPF_0_0_0 This métier 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 métier comprises around 10 fishing vessels, distributed between the 12-18 and 18-24 m segments. This fishery is seasonal operating mostly during the second and third quarters of the year.

Purse seine fishery for small pelagic fishes

PS_SPF_16_0_0 This métier 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 métier, from 2009 onwards, is comprised by only 3 vessels of the 18-24 m segment operating all year round mostly at the south coast of Madeira island.

Hook fishery for demersal and coastal species

LLS_FIF_0_0_0 This métier comprises a multispecific fishery, developed with bottom longlines (LLS), handlines (LHP) and bottom traps (FPO), targeting a large number of demersal species (FIF) with high commercial value (peixe fino). This fishery is operated all year round by small vessels in the insular shelf. In this métier the captures includes mainly demersal and pelagic fish species (about 100 species) but only a few present relevant catches. These include red porgy (*Pagrus pagrus*), pink dentex (*Dentex gibbosus*), forkbeard (*Phycis phycis*), blacktail comber (*Serranus atricauda*), wreckfish (*Polyprion americanus*), alfonsinos (*Beryx splendens* and *Beryx decadactylus*), amberjacks (*Seriola* sp), barracuda (*Sphyraena* sp), conger eel (*Conger conger*), blackspot seabream (*Pagellus bogaraveo*), moray eel (*Muraena helena*), scorpion fish (*Scorpaena scrofa*) and offshore rockfish (*Pontinus kuhlii*).

Scuba diving for limpets

MIS_MOL_0_0_0 This métier is the principal occupation of 7 small vessels (<10 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 31th March.

III.B. Economic Variables

BALTIC SEA (ICES areas III b-d), NORTH SEA (ICES areas IIIa, IV and VIId) AND EASTERN ARCTIC (ICES areas I and II), NORTH ATLANTIC (ICES areas V-XIV and NAFO areas)

III.B.1. Achievements: Results and deviation from NP Proposal

Mainland and Azores

As stated in our NP 2014- 2016, the collection of economic data defined in DCF was achieved through a survey, applied to a statistical sample, by means of random stratified sampling method.

The reference year was 2015 and the target population was composed by registered vessels. Inactive vessels are not part of the annual survey.

A questionnaire was drafted and sent by mail and by email directly to the owners of the selected vessels and to producer's organizations and associations.

The differences between fleet segments regarding NP are due to the activity of the vessels and to the changes in the fleet. NP numbers and fleet segments are estimates based on licensing. When we take in consideration the activity of the vessels, as stated in DCF regulation, some reallocations between fleet segments occur and with them the need of possible clustering changes. Clustering was maintained as stable as possible over the years.

The principle for clustering maintenance is related with the fact that it would not make sense for the analysis of a time series, if singular entrance and withdraw of some segments is considered only based on a different temporary activity pattern of the vessels. It's important take into account that being a polyvalent fleet, this situation is quite common when segments are small and small vessels have to adapt to weather conditions. For this reason it is important to maintain an analytical stability keeping these segments clustered so that economic analysis can make sense.

In 2016, fleet economic data was collected in the Autonomous Region of the Azores following the methodologies described in the National Plan. Frame population was determined from the total population based on the fleet register and licensing for the reference year (2015). The frame population of active vessels was stratified into segments based on size, fishing technic and island.

A random sample was formed from each segment and the national questionnaire mailed to the professional associations based in each island of the Azores.

The number of sample units per stratum and the coverage rate is reported in Table III.B.1.

The inquiry process for the reference year 2015 was completely carried out.

In annex 1 the methodology for the estimation of socio-economic data is presented.

Calculation of capital values and capital costs

The value of fixed assets and the capital costs are estimated processing data of the Vessel Register and according to the methodology suggested by the study on "evaluation of the capital value, investments and capital costs in the fisheries sector" (No FISH/2005/03) known as PIM methodology.

In order to adjust the result of PIM methodology to the reality of the national fishing fleet, the values in the allocation of life to the hull and motor were revised to calculate the Capital with depreciation replacement value (totDepRep), the depreciation cost value and the interest cost value (annex I). This was applied to 2015 data, but a revision in capital variables time series will be performed next year.

According to the capital study, the estimation of the capital value (GCS) consisted of three steps:

1. Specification of the composition of the active fleet by age

The specification of the composition of the active fleet by age has been done by processing the fleet register.

2. Estimation of price per unit of capacity (e.g. per GT)

In order to apply the PIM (perpetual inventory method) and in absence of other possibilities, the price per unit of capacity is estimated having in mind the price for building new vessels (replacement values). Those prices for 2011 were:

- Small scale fleet segment = 21 050,00euros/GT
- Polyvalents segment > 12 meters = 47 250,00euros/GT^{0,7}
- Trawl segment = 25 820,00 euros/GT^{0,8}
- Seiner segment = 15 170,00 euros/GT

3. Calculation of the values of each vintage of the fleet at current prices.

After (1) and (2) we are able to estimate the Gross capital stock, the depreciated replacement value, and all the others variables. Inactive vessels are considered in the evaluation of the capital value and capital costs.

Calculation of FTE

The following procedure was used to calculate FTE:

From the survey information is collected about:

- Number of months of activity
- Number of days of activity
- Average number of working hours per day
- Number of workers per month/gender/type of employment(partial/full time)
- Number of unpaid workers

Administrative data:

- Number of days of activity, from logbooks and auctions

G – Gender (M/F)

T – Type of employment (Partial/Full)

DA – Days of activity

WH – Average working hours

NUL – Number of unpaid labourers

If a vessel answers the survey:

1. Calculate the monthly average of workers (per gender and type of employment), $AVGw(G,T)$
2. $FTE\ national(G) = AVGw(G,Full\ time) + AVGw(G,Partial\ time) \times [\min(8,WH)/8]$
3. $FTE\ harmonized(G) = FTE\ national(G) \times DA \times WH / 2000$

If a vessel doesn't answers the survey:

$AVGFTE(G)$ – Average number of FTE of the fleet segment(per gender)

$AVGWH$ – Average of working hours of the fleet segment

$AVGNUL$ – Average of unpaid labourers of the fleet segment

1. $FTE\ national(G) = AVGFTE(G)$
2. $FTE\ harmonized(G) = FTE(G) \times AVGWH \times DA$
3. $NUL = AVGNUL$

To calculate imputed value of unpaid labour:

If the vessel answers the survey:

Number of unpaid labourers x Crew Wages/Total FTE

If the vessel doesn't answer the survey:

Average number of unpaid labourers x Average Crew Wages per FTE of the fleet segment.

III.B.2. Data quality: Results and deviation from NP Proposal

Mainland and Azores

There is a special effort to get consistent results for some economic parameters like: financial position in what concern the small scale fisheries. The information to calculate those variables was collected, however due to non-consistent responses the results may have bias.

The sample size for each fleet segment is determined by statistical procedure and targeting the precision level required by DCF for the variable income of the previous year (usually $CV < 5\%$). In 2016 to mitigate the non-responses, the CV was increased to 20%. The criteria for the sample size by segment were also revised for a minimum of 30 vessels per segment and a census approach for segments with less than 15 vessels.

The methodology used since the beginning of the DCF is based on averages of the fleet segments. However fleet vessels inside the DCF segment are not homogeneous. To minimize this problem further segmentation has been applied but with limited results. With the raising in importance of the economic results, namely on the balance report, the greater complexity of the processes and the growing needs on the amount, diversity and quality of information and the feeling that quality of the results needs improving in order so that the estimates may be used, a revision of the methods and procedures in place to collect, aggregate and estimate the variable values of the fleet begun in 2014 and finished in 2015. This revision was fully applied in 2016 estimations. An analysis of the results of the surveys over the years shows significant variations in the answers to the survey. The same vessels can have, from year to year, huge variations for some variables that were expected to remain relatively stable, as fixed costs. The conclusion was that on different years the respondents use different interpretations for the same questions (with the possibility of different respondents (e.g. accountants) on different years for the same vessels). Adding to the low number of answers, the variations (and bias) of the estimators may be substantial. The new methodology developed makes use of administrative data, combined with answers from the surveys and some modelling in order to achieve better quality with the available data. Variability is still high, as the base sample data also have high variability, but is mitigated to the previous knowledge from the administrative auxiliary variables and is lower than the variability achieved with the old methodology. It should be noticed that, after taking into consideration the errors on the sample data, they still reflect the variability of the target population, as it should from a statistical point of view. On a well succeeded statistical operation, highly heterogeneous population will be reflected on a highly variable sample data. The new methodology is explained in annex 1.

III.B.3. Actions to avoid deviations

New methodology was developed in order to improve the quality of the estimates and the stability and consistency of the time series. From the analysis of the answers to the surveys over the years it was noticed inconsistencies and misinterpretations of what was actually asked. One of the constraints was that the instructions were not read by the respondents. The questionnaire was changed in order to reduce the possibility of misunderstanding and the instructions were merged into it. Data checks are performed in questionnaires data and a contact is done with the accounting officer or vessel owner to validate the information. The calendar for 2016 was anticipated in order to have the results sooner and therefore more time to do the analysis and calculate the estimates.

MEDITERRANEAN AND BLACK SEA

III.B.1. Achievements: Results and Deviation from NP Proposal

There are only two vessels operating with passive gears (pots) in the Mediterranean Sea. Due to the need to provide information to the GFCM, permission was obtained for the two vessel owners to disclosure data for the two.

III.B.2. Data quality: Results and Deviation from NP Proposal

It is now possible to provide information for Mediterranean waters.

III.B.3. Actions to avoid deviations

No deviations.

OTHER REGIONS

III.B.1. Achievements: Results and Deviation from NP Proposal

Autonomous Region of Madeira (CECAF 34.1.2)

In 2016, data for this module was collected in the Madeira region following the methodologies described in the National Plan for this year. Population segments considered for the collection of economic data resulted from the Universe of the registered vessels and its distribution is included at a national level in Table III.B.1. The acquisition of economic data was made by census, and the percentage of coverage achieved is indicated in this Table for each of the population segments.

The form prepared for national use was adapted and used in active vessels both in the census survey. Source of the data required in the case of non-active vessels was the fleet register. Table III.B.3. shows the strategy used for the collection of data in each of the variables.

The objectives set for 2016 were almost achieved concerning the acquisition of data. (Table III.B.1.). Response rate achieved was about 100% in most segments. The only significant deviation from aim was in the segment Passive gears: Vessels using hooks (24-40m). Due to the small number of vessels in this segment the lack of response by two vessels was important.

The value of fixed assets and the capital costs are estimated using the same methodology as the one referred for Mainland (e.g. “evaluation of the capital value, investments and capital costs in the fisheries sector” (No FISH/2005/03).

III.B.2. Data quality: Results and Deviation from NP Proposal

Autonomous Region of Madeira (CECAF 34.1.2)

Not applicable.

III.B.3. Actions to avoid deviations

Autonomous Region of Madeira (CECAF 34.1.2)

Due to some doubts arising from answers to the inquiries, especially in the case of small vessels (under 10 m), validation of data was made in the case of the variables where administrative data exists. This validation allows increasing the reliability of the answers through the crosschecking of the responses to the survey versus recorded data from vessel activity, e.g., income with landings and fuel volume.

III.C. Métier-related variables

NORTH SEA AND EASTERN ARCTIC (ICES areas I, II)

III.C.1 Achievements: Results and deviation from NP proposal

In 2016, for ICES divisions I and II, Portugal applied the métier based sampling strategy. There were 2 identified métiers, labelled at level 6, for which fishing activity has been recorded during the reference period (see Table III.C.1). The information used for selecting these métiers was obtained from logbook data (2014 – 2015). No métiers have been merged in these fishing grounds (ICES areas I, II). Table III.C.4 provides details on the planned number of trips to be sampled in 2016, according to the sampling strategy used by Portugal. The results of sampling in 2016, regarding trips per métier and length from catches, landings and discards by métier and species, are presented in Table III.C.3 and III.C.6, respectively.

There were no deviations from the sampling strategies outlined in Portugal's NP 2014-2016 (which is a rollover from the NP 2011-2013), in terms of the planned versus sampled number of trips in ICES areas I and II. The fisheries in the Eastern Arctic fishing grounds are composed by almost clean catches of target species (cod and redfish) with few by-catches, which are difficult to sort out and to sample within the usual large volumes of total catch, and under time constraints. On-board sampling conditions (only one observer, limited time, sampling the entire trip, sorting representative samples of target or priority species and of most abundant by-catch) leave no room to collect samples of less abundant and/or non-commercial fish. For this reason, table III.C.6 includes no other species than those planned in the relevant NP.

III.C.2 Data quality issues

In ICES divisions I and II only at-sea sampling (concurrent sampling) is conducted, with the purpose of obtaining catch (unsorted catches) composition, volume, positions, effort, lengths and biological parameters of Portuguese vessels operating in the area. The vessels selection is quasi-random, from a set of cooperative vessels. The Primary Sampling Unit (PSU) is trip. Haul selection is random. For each sampled haul, representative samples of target or priority species (as those under moratorium), along with another from the most abundant by-catch, are sorted. This task is performed by one person (the nurseman) under a tight fishing haul schedule, leaving no room to collect samples of less abundant and/or non-commercial fish. The fisheries in Eastern Arctic fishing grounds are composed by almost clean target catches with few by-catches, difficult to collect within usual large volumes of total catch.

The sampling of each species is random; each sample is taken from the haul catch before any rejections. The sample length is made by sex (exception for cod) consisting in recording the sample weight and collecting all individual lengths. A subsample from length sampling is taken to collect biological data.

There were no deviations from the NP proposal regarding data quality. Several quality control assessment analyses (quarterly and annual) are implemented on the national data base. These checks assure that the type

of data and the range of the variables are correct. Checks on national data processing include monitoring achievements, trend analysis, quality indicators and non-response rates.

III.C.3 Actions to avoid deviations

No deviations.

NORTH ATLANTIC (ICES areas IXa - Mainland and Xa – Azores, NAFO areas 3LMNO and ICES areas XII, XIV and Va)

III.C.1 Achievements: Results and deviation from NP proposal

ICES area IXa – Mainland

In 2016, for ICES division IXa, Portugal applied the métier based sampling strategy. The identified métiers, labelled at level 6, for which fishing activity has been recorded in this region during the reference period, are listed in Table III.C.1. The information used for selecting these métiers was obtained from logbook data (2014 – 2015), and the métiers were selected by the ranking algorithm defined on the DCF. Some of the gill net and trammel nets are merged with other métiers for sampling in these fishing grounds (ICES division IXa). Justifications for merging are provided in Table III.C.3.

Table III.C.4 provides details on the planned number of trips to be sampled in 2016, according to the sampling strategy used by Portugal. The results of sampling in 2016, regarding trips per métier and length from catches, landings and discards by métier and species, are presented in Table III.C.3 and III.C.6, respectively.

In general, deviations from the sampling strategies outlined in Portugal's NP 2014-2016 (which is a rollover from the NP 2011-2013), in terms of the planned versus sampled number of trips, are due to the time lag between the reference years in the NP and the sampling year. It is also important to emphasize, that once a randomized sampling is in place, the primary sampling unit is no longer a métier but a trip or auction*day that has been randomly selected. Thus, the randomization process will result in métier coverage proportional to their use by the fisheries so that the completion of a planned number of samples by métier can no longer be the aim of a sampling program. Besides that, regarding at-market sampling, it is often a problem that vessels with a large amount of landings/species/categories arrive to the port after the auction has started, leaving no time to sample the complete trip. (e.g.: OTB_DEF). It also happens that shipmasters do not give permission for observers to sample fish from their vessels. Furthermore, some commercial species may not be available for sampling if they have been subjected to previously fixed sale contract. Sometimes observers do not have time to sample all commercial species, so they select the more important species. Regarding at-sea sampling, difficulties in the execution of the planned sampling arise from the problem that for some fleets (e.g.: GNS_GTR) there is a large number of smaller vessels that cannot take observers onboard, from the increased refusal rate for on-board observers from TBB_MCD vessels, from logistic difficulties in transportation of observers to certain ports. It also happens that trips from vessels licensed for multiple gears other than GNS and GTR (e.g. FPO, LLS), result in a multiplicity of species that can be targeted per fishing trip, making it particularly difficult to provide robust estimates for species at a métier basis. Detailed comments on particular métiers, regarding deviations, are included in the Comments column in Table III.C.3.

ICES area Xa – Azores

IMAR/DOP is responsible for the collection of this information in ICES Division Xa. All identified métiers for which fishing activity was recorded during the reference period are indicated in Table III.C.1. Reference period in Table III.C.1 was updated using the average values of the two previous years (2014 and 2015).

Information used for ranking the métiers through landings and value was obtained from sales notes (census), while for effort the number of days at sea was obtained from sales notes and logbooks (census) as well as from inquiries (probability based survey).

All the métiers identified after updating the reference values with the 2 previous years of the sampling year, were the same as indicated in the NP2014-2016. Through the application of the ranking system based on effort, landings, discards and value variables, the métiers selected for sampling in ICES area X continues to be gillnets, handlines targeting squid, handlines targeting finfish, pole-lines targeting tuna, set longlines for demersal fishes and purse seiners targeting small pelagic fishes. Handlines targeting finfish were not identified for sampling through discards. There was no need to merge any of the métiers selected for sampling.

Sampling strategy continues to be concurrent 'métier based' sampling strategy through probability sample survey data collection scheme (Table III.C.4). Methodology applied in order to collect the data within this module followed the one described in the NP2014-2016.

The sampling objectives, targets and strategies and quantities in 2016 were unchanged compared to 2013 and are described in the NP 2014-2016 of PRT. Table III.C.4 provides the sampling strategy applied by PRT in 2016. The achieved sampling is provided in table III.C.3. The achieved length sampling of catches, landings and discards by métier and species is given in table III.C.6.

Sampling of fishing trips (tables III.C.3 and III.C.4)

AZ1 – GNS_FIF_>=100_0_0 (Gillnets targeting demersal fishes, e.g. *Sparissoma cretense*)

Concurrent sampling at sea: not planned

Concurrent sampling on shore: 53 sampled fishing trips (59% of planned 90 trips)

Total: 53/90 (59%)

Reason for shortfall: besides extra effort was exerted at sampling this métier during summer in Faial island (one boat using this métier); most of the landings coming from this métier occur in islands and small harbours not covered;

AZ2 – LHP_CEP_0_0_0 (Handlines targeting squid – *Loligo forbesi*)

Concurrent sampling at sea: not planned

Concurrent sampling on shore: 410 sampled fishing trips (117% of planned 350 trips)

Total: 410/350 (117%)

Reason for exceeding: samplers had improved the access to these landings resulting in oversampling although representing no extra expense for the data collection programme;

AZ3 – LHP_FIF_0_0_0 (Handlines targeting finfish, e.g. *Pagellus bogaraveo*, *Pagrus pagrus*, *Phycis phycis*)

Concurrent sampling at sea: 49 sampled fishing trips (102% of planned 48 trips)

Concurrent sampling on shore: 845 sampled fishing trips (179% of planned 472 trips)

Total: 894/520 (172%)

Reason for exceeding (market sampling): number of trips from this métier increased from 17970 in 2015 into 18349 in the sampling year reflecting the oversampling observed, however, it did not represent extra expense for the data collection programme; while samplers are at the market, waiting to sample the targeted frames, time is used to sample an accessory number of trips;

AZ5 – LLS_DEF_0_0_0 (Set longlines targeting for demersal fishes, e.g. *Pagellus bogaraveo*, *Helicolenus dactylopterus*)

Concurrent sampling at-sea: 48 sampled fishing trips (100% of planned 48 trips)

Concurrent sampling on-shore: 530 sampled fishing trips (380% of planned 152 trips)

Total: 578/200 (289%)

Reason for exceeding (market sampling): due to consist on a métier that is present through all the vessel length class segmentation, oversampling occurs since while samplers are at the market, waiting to sample the targeted frames, time is used to sample an accessory number of trips; this represented no extra expense for the data collection programme;

AZ6 – PS_SPF_>=160_0_0 (Purse seine targeting *Trachurus picturatus*, *Scomber colias*)
Concurrent sampling at-sea: not planned
Concurrent sampling on-shore: 156 sampled fishing trips (104% of planned 150 trips)
Total: 156/150 (104%).

Length sampling by métier and species (table III.C.6)

The concurrent sampling strategy of commercial catches results in a large list of species being sampled, more precisely, 86 different species were sampled during 2016 (Table III.C.6), representing 111.560 specimens. Although not selected, sampling occurred for several gears, such as FPO_CRU, FPO_FIF and LLD_LPF. This occurs as opportunistic strategy, every time samplers are present at the market and they have a time window that allows them to sample other métiers besides the planned ones. This sample of accessory trips represents no additional costs to the data collection programme.

Sampling intensities are so reliant on number of trips sampled by métier as on the volume of the catch, landings and discards per species. For some of the species this entails oversampling, while for others the result will reflect shortfalls:

1) Reasons for oversampling

- i) *Phycis phycis* [3534 sampled (177% of planned 2000)], *Raja clavata* [1411 sampled (235% of planned 600)] and *Trachurus picturatus* [11429 sampled (114% of planned 10000)]: higher availability in the landings at harbours with presence of samplers;
- ii) *Sparidae* [12877 sampled (1073% of planned 1200)]: six different species are included showing a 51% increase of the volume landed in the sampling year, which reflects in a higher number of specimens sampled;

2) Reasons for shortfalls

- i) *Aphanopus spp.* [2 sampled (0.3% of planned 600)]: during the sampling year the Azorean fleet did not fished for black scabbard fish, being the individuals available for sampling a by-catch from the set longline fishery for demersal species. Around 34.7 tonnes (97.7% total catch), were landed in one month by one boat from Madeira in a harbour without sampling coverage and individuals landed were not available for purchase;
- ii) *Aspitrigla cuculus* [174 sampled (29% of planned 600)], *Molva dipterygia macrophthalmia* [110 sampled (18% of planned 600)], *Phycis blennoides* [226 sampled (38% of planned 600)], *Polyprion americanus* [1566 sampled (16% of planned 10000)] and *Zeus faber* [348 sampled (58% of planned 600)]: overestimated planned number of fish to be measured; landings quantities were very low and consequently its availability for sampling was scarce; in addition, blue ling and wreckfish are often landed gutted;
- iii) *Beryx spp.* [5259 sampled (53% of planned 10000)]: overestimated planned number of fish to be measured; the fishery of *Beryx spp.* closed in mid-July due to national quota achievement and consequently reduced the fishing season, which reflected in the low number of specimens sampled. Another reason consists in reduced number of length classes available for sampling due to minimum landing size;
- iv) *Conger conger* [1180 sampled (59% of planned 2000)]: overestimated planned number of fish to be measured, volume landed continues to drop, reduced number of length classes available for sampling due to minimum landing size and presence of gutted fish at landings;

- v) *Helicolenus dactylopterus* [12131 sampled (81% of planned 15000)]: overestimated planned number of fish to be measured and reduced number of length classes available for sampling due to minimum landing size;
- vi) *Mullus surmuletus* [366 sampled (31% of planned 1200)] and *Octopus vulgaris* [4 sampled (1% of planned 600)]: the métier FPO_FIF and FPO_CRU targeting these species was not selected for sampling, this way individuals sampled are a consequence of the concurrent sampling strategy;
- vii) *Pagellus bogaraveo* [20164 sampled (67% of planned 30000)]: due to the implementation of more restrictive management policies such as, a further reduction of 171 tonnes in the Azorean quota (-25%), a local imposed fishery closure season and the increase of the minimum landing size twice in the sampling year; all these facts contributed to less available specimens of this species for sampling;
- viii) *Centrophorus granulosus* [0 sampled (0% of planned 300)] and *Dalatias licha* [0 sampled (0% of planned 300)]: no samples are available at the market once these species TAC is zero, and no occurrence was registered in the discards sampling programme;

NAFO areas 3LMNO and ICES areas XII, XIV and Va

In 2016, for NAFO areas 3LMNO and ICES areas XII, XIV and Va, Portugal applied the métier based sampling strategy. There were 2 identified métiers, labeled at level 6, for which fishing activity has been recorded during the reference period (see Table III.C.1). The information used for selecting these métiers was obtained from logbook data (2014 – 2015). No métiers have been merged in these fishing grounds (NAFO areas 3LMNO and ICES areas XII, XIV and Va). Table III.C.4 provides details on the planned number of trips to be sampled in 2016, according to the sampling strategy used by Portugal. The results of sampling in 2016, regarding trips per métier and length from catches, landings and discards by métier and species, are presented in Table III.C.3 and III.C.6, respectively.

Deviations from the sampling strategies outlined in Portugal's NP 2014-2016 (which is a rollover from the NP 2011-2013), in terms of the planned versus sampled number of trips in ICES areas XII, XIV and Va, occurred because due to low amount of quota there was no fishing activity in the fishing ground. The cooperative vessels operated exclusively in ICES I and II areas. Regarding NAFO areas 3LMNO, there were no deviations. Detailed comments on the length sampling of *Raja* spp. are included in the Comments column in Table III.C.6.

III.C.2 Data quality issues

ICES area IXa – Mainland

In the ICES area IXa both at-market and at-sea samplings (concurrent sampling) are conducted. The purpose of at-market sampling is to obtain length distributions of fish landed at auctions by Portuguese vessels operating in this area. The Primary Sampling Unit (PSU) is auction*day. The Portuguese fleet is stratified by fleet, auction and quarter. Following the DCF requirements [EU Commission Decision (2016/1251)], less significant fleets are not sampled (e.g. dredges, beach-seines) and sampling effort is established as number of trips. Annual sampling effort is fixed by the DCF National Sampling Plan that sets number of trips to be sampled in each fleet (\approx métier). Sampling effort is allocated to auctions and quarters proportionally to last year's landings. For each fleet, the visit dates in each auction*quarter are spread somewhat systematically throughout the quarter in a way that covers all week-days where the fleet is active. In every auction*visit_date, observers attempt to sample a predefined number of vessel_sale_events, that are haphazardly selected from a list of all landings awaiting auction. This list includes the name of each vessel and the commercial species, commercial category and weight of each of its boxes. Each vessel_sale_event

generally corresponds to the landings of one fishing trip. A minor proportion of vessel_sale_events may not be present in the selection list at selection time when sampling starts. In each vessel_sale_event, the observers aim to sample boxes from every commercial species and commercial category. Within each commercial category, the observers select 1 box haphazardly. When there are very few fish from a scientific species inside the box, observers take more boxes until the length composition of the size category is well defined. When different species are present within a box, observers sample them all.

The data from at-market sampling in ICES area IXa are stored in a national (local) data base, on which several quality control assessment analyses (quarterly and annual) are implemented. The database is programmed in Oracle and contains internal routines for the detection of basic errors (e.g.: errors in dates). Also, quarterly checks are performed using R and SQL routines. These checks assure that the type of data and the range of the variables are correct. Checks on national data processing include monitoring achievements, trend analysis, quality indicators and non-response rates. Quarterly checks are performed, using R scripts, on all commercial sampling data logged by the observers into the database. Each observer checks his data and gets feedback on quality results. Checks are run sequentially and until observer data are free of major errors.

The purpose of at-sea sampling in ICES Division IXa is to obtain catch (discards + landings) composition, volume, lengths and age of fish captured by Portuguese vessels operating in this area. The Primary Sampling Unit (PSU) is trip, and the vessel selection is quasi-random, from a set of cooperative vessels. Haul selection is systematic (odd or even hauls) after a random choice of the starting haul (first or second). Catch volume is estimated independently from skipper's opinion. It is obtained from the relative proportion between discards: retained weight in a sample from catch and raised by total landings. The number of specimens per species and the length composition are collected in fixed gears instead of weights. In what concerns the onboard sampling strategy, observers follow crew's criteria to sort landings and discards when they are in deck. The onboard sampling procedure differs between active (OTB, TBB and PS) and fixed gears (GNS, GTR, LLS_DWS).

The data from at-market sampling in ICES area IXa are stored in a national (local) data base, on which several quality control assessment analyses (quarterly and annual) are implemented. The database is programmed in Oracle and contains internal routines for the detection of basic errors (e.g., errors in dates). Data recorded refers to general trip information (location, haul number, retained weight by species), sample information by fraction (retained, discarded) and species, namely weight, number of specimens and length composition. Quality checks are carried out for all sampled fleet segments but, in what concerns to trawl fleet segment, a semi-automated R quality assurance procedure was designed and the entire trawl database is checked for additional undetected errors.

ICES area Xa – Azores

Member States' programmes for 2016 were defined in the national proposals for 2011-2013 due to the roll-over of programmes on commencement of the European Maritime and Fisheries Fund in 2014. No amendments to national programmes were permitted and consequently, it was not possible to update it in terms of the planned number of trips to be sampled. The additional time required for concurrent sampling onshore continues to be a limiting factor. The time window required to undertake concurrent sampling often results in not all required species in the landing being measured during the period in which samples are available at the market resulting in incomplete samples.

Quality checks and validation procedures implemented for both at sea and on shore data collection are: (1) All samples are checked by a coordinator before the input of data; (2) All data introduced in the 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, like for example, type of data and values range of the variables; (4) Length distributions are then connected with the market landings for future cross examinations.

NAFO areas 3LMNO and ICES areas XII, XIV and Va

In NAFO areas 3LMNO and ICES areas XII, XIV and Va only at-sea sampling (concurrent sampling) is conducted, with the purpose of obtaining catch (unsorted catches) composition, volume, positions, effort,

lengths and biological parameters of Portuguese vessels operating in the area. The vessels selection is quasi-random, from a set of cooperative vessels. The Portuguese vessels are factory vessels that are obliged in NAFO to carry out a Compliance Observer Programme. This implies not only the accommodation facilities for this observer extra crew, but prevents the income of another observer (scientific) from outside. In practice, this obligation constrain the performance of scientific sampling to the more adequate skills within the crew, who is, by the nature of his professional background and the all round tasks he performs, the nurseman of the vessel. The Primary Sampling Unit (PSU) is trip. Haul selection is random. For each sampled haul, representative samples of target or priority species (as those under moratorium), along with another from the most abundant by-catch, are sorted. This task is performed by one person (the nurseman) under a tight fishing haul schedule, leaving no room to collect samples of less abundant and/or non commercial fish. Sampling for each species is random; each sample is taken from the haul catch before any rejections. The sample length is made by sex (exception for cod) consisting in recording the sample weight and collecting all individual lengths. A subsample from length sampling is taken to collect biological data.

Due to low amount of quota there was no fishing activity in the fishing ground XII, XIV and Va; the cooperative vessels operated exclusively in ICES I and II areas.

There were no deviations from the NP proposal regarding data quality NAFO areas 3LMNO. The data from ICES areas XII, XIV and Va are stored in a local data base and upload in the international data bases FishFrame and Intercatch. NAFO data are stored in a local data base and submitted to quality check to meet NAFO requirements, and are further validated by NAFO. Estimates at fleet level have been provided to NAFO and the relevant ICES working groups. Several quality control assessment analyses (quarterly and annual) are implemented on the national (local) data bases. These checks assure that the type of data and the range of the variables are correct. Checks on national data processing include monitoring achievements, trend analysis, quality indicators and non-response rates.

III.C.3 Actions to avoid deviations

ICES area IXa – Mainland

No action possible to reduce uncertainty of fleet activity. To avoid at sea sampling shortfalls IPMA continues enhancing communication with stakeholders in order to minimize difficulties raised by the fishing industry operators and trying to reach its wide participation, including self-sampling cooperation.

ICES area Xa – Azores

The difficulties arising are communicated to the coordination of the program, being implemented adjustments throughout the year of sampling in order to improve the achievement rate. Nonetheless, bias occur due to reasons explained in section III.C.1 as well as limited fish handling by some of the fishing industry operators or changes in the regular landing procedure of some métiers. Efforts will be employed to overcome all these constraints observed in 2016, in order to raise the number of sampled trips and thus the number of specimens measured.

To achieve the number of trips to be sampled for métier GNS_FIF_>=100_0_0, efforts will be employed in order to overcome the lack of a sampler in Pico island or to appoint staff from neighbouring islands to the ones where the presence of this métier is more representative.

In an experimental basis during 2017, length measurements will also be recorded in some auctions using an electronic system composed by a local unit for automatic image acquisition of fish boxes and a remote database to record the processed images using Fishmetrics system. It is expected to improve some efficiencies in data handling and to provide greater quality assurance. Sampling of *Aphanopus spp.* will be intensified as soon as fishing and landings are resumed.

Meetings with the industry in 2016 has improved access in some areas and these will continue into the future WP 2017-2019.

Regarding length sampling for other species, Portugal believes that the sampling programmed in the work plan for 2017-2019 will overcome the issues appointed in section III.C.1.

NAFO areas 3LMNO and ICES areas XII, XIV and Va

There was no fishing activity in the fishing ground ICES Areas XII, XIV and Va in recent years. If the redfish stocks recover and the TAC/quota increases, it is natural that Portugal starts again fishing in these areas. For the moment it is not profitable, that is why Portugal in recent years exchanges its low amount of quota.

In 2016, no directed fishery to thorny skate was recorded on the vessels sampled by IPMA in the NRA, and so no skate sampling occurred (cod, greenland halibut and redfish were the target species of those vessels last year).

During 2016 it was not possible to collect otoliths in the cod fishery in the 3M Division of the NAFO Regulatory Area. This situation resulted from two constraints: the retirement of our best sampler (nurseman on board working as sampler of our programme for more than 20 years) and the little experience of the new samplers (also nursemen on board) in the collection of otoliths. For the year 2017, we are committed to resume the collection of cod otoliths in the Division 3M, as the new samplers at the service of the IPMA have improved their skills and become more familiar with the several steps of the sampling work.

OTHER REGIONS (ICCAT – Mainland (BF58); ICCAT – Mainland (BIL94 A+B, BIL96, BIL97); ICCAT – Azores; IOTC (FAO 51+57); and CEEAF – Madeira (FAO 34.1.2))

III.C.1 Achievements: Results and deviation from NP proposal

ICCAT – Mainland (BF58)

In 2016, for the fishing ground ICCAT – Mainland (BF58), Portugal applied the métier based sampling strategy. There was 1 identified métier, labeled at level 6, for which fishing activity has been recorded during the reference period (see Table III.C.1). The information used for selecting this métier was obtained based on the information that in this fishing ground the target species is *Thunnus thynnus*, and the gear group is tuna traps. No métiers have been merged in these fishing grounds (ICCAT – Mainland (BF58)). Table III.C.4 provides details on the planned number of trips to be sampled in 2016, according to the sampling strategy used by Portugal. The results of sampling in 2016, regarding trips per métier and length from catches, landings and discards by métier and species, are presented in Table III.C.3 and III.C.6, respectively.

In general, deviations from the sampling strategies outlined in Portugal's NP 2014-2016 (which is a rollover from the NP 2011-2013), in terms of the planned versus sampled number of fishing trips in the fishing ground ICCAT – Mainland (BF58), are due to the time lag between the reference years in the NP and the sampling year. It is also important to emphasize, that once a randomized sampling is in place, the primary sampling unit is no longer a métier but a trip that has been randomly selected. Thus, the randomization process will result in métier coverage proportional to their use by the fisheries so that the completion of a planned number of samples by métier can no longer be the aim of a sampling program.

ICCAT – Mainland (BIL94 A+B, BIL96, BIL97)

In 2016, for the fishing ground ICCAT – Mainland (BIL94 A+B, BIL96, BIL97), Portugal applied the métier based sampling strategy. There was 1 identified métier, labeled at level 6, for which fishing activity has been recorded during the reference period (see Table III.C.1). The information used for selecting this métier was obtained based on the information that in this fishing ground the target species is *Xiphias gladius*, and the gear group is drifting longlines. No métiers have been merged in these fishing grounds (ICCAT – Mainland (BIL94 A+B, BIL96, BIL97)). Table III.C.4 provides details on the planned number of trips to be sampled in 2016,

according to the sampling strategy used by Portugal. The results of sampling in 2016, regarding trips per métier and length from catches, landings and discards by métier and species, are presented in Table III.C.3 and III.C.6, respectively.

In general, deviations from the sampling strategies outlined in Portugal's NP 2014-2016 (which is a rollover from the NP 2011-2013), in terms of the planned versus sampled number of fishing trips in the fishing ground ICCAT – Mainland (BIL94 A+B, BIL96, BIL97), are due to the time lag between the reference years in the NP and the sampling year. It is also important to emphasize, that once a randomized sampling is in place, the primary sampling unit is no longer a métier but a trip that has been randomly selected. Thus, the randomization process will result in métier coverage proportional to their use by the fisheries so that the completion of a planned number of samples by métier can no longer be the aim of a sampling program.

ICCAT - Azores

IMAR/DOP is responsible for the collection of this information for the pole and line fishery targeting tuna (ICCAT).

Sampling strategy continues to be concurrent 'métier based' sampling strategy through probability sample survey data collection scheme (Table III.C.4). Methodology applied in order to collect the data within this module followed the one described in the NP2014-2016.

The sampling objectives, targets and strategies and quantities in 2016 were unchanged compared to 2013 and are described in the NP 2014-2016 of PRT. Table III.C.4 provides the sampling strategy applied by PRT in 2016. The achieved sampling is provided in table III.C.3. The achieved length sampling of catches, landings and discards by métier and species is given in table III.C.6.

Sampling of fishing trips (tables III.C.3 and III.C.4)

AZ4 – LHP_LPF_0_0_0 (Pole lines targeting tuna species)

Concurrent sampling at sea: not planned

Concurrent sampling on shore: 56 sampled fishing trips (62% of planned 90 trips)

Total: 56/90 (62%)

Reasons for shortfalls: the lack of a sampler in Pico island; as a result of low abundance, nominal catch of tuna species was approximately 59% less of the observed in 2015; 60% number of trips breakdown; significant changes in the landing pattern brought difficulties in accessing these landings by the samplers (e.g., landings directly into the tuna industry trucks and landings occurring at different harbours).

Length sampling by métier and species (table III.C.6)

The concurrent sampling strategy of commercial catches results in a large list of species sampled, more precisely, 8 different species were sampled during 2016 (Table III.C.6), representing a total of 6.380 specimens.

Considering all tuna species, they recorded a decrease of about 26% in volume landed in 2015 that was worsened by an extra decrease of 59% in 2016. Exception made for *Thunnus albacares*, which registered no variability in the volume landed (~ 4 tonnes), all the others species registered breaks in landings between 43% (*Katsuwonus pelamis*), 73% (*Thunnus obesus*) and 89% (*Thunnus alalunga*).

Sampling intensities are so reliant on number of trips sampled by métier as on the volume of the catch and landing of species. For some of the species this entails oversampling, while for others the result will reflect shortfalls:

- 1) Reasons for oversampling

- i) *Squaliformes* [2060 sampled (687% of planned 300)]: once species TAC is zero, no samples are available at the market; the only data source for these species is from the at sea discard sampling programme where length composition sampling of *squaliformes* is obtained from every individual discarded and no additional costs are imputed to the data collection programme;

2) Reasons for shortfalls

- i) *Thunnus alalunga* [13 sampled (2.2% of planned 600)], *Thunnus albacares* [2 sampled (1.3% of planned 150)], *Thunnus obesus* [1424 sampled (71% of planned 2000)] and *Katsuwonus pelamis* [2671 sampled (27% of planned 10000)]: landings quantities were very low and consequently its availability for sampling; a 60% drastic reduction of LHP_LPF trips during 2016 reflected in landings decrease from: 51 tonnes (2015) into 6 tonnes (2016) for albacore, 1273 tonnes (2015) into 345 tonnes (2016) for bigeye and 1180 tonnes (2015) into 674 tonnes (2016) for skipjack;
- ii) *Isurus oxyrinchus* [0 sampled (0% of planned 600)], *Prionace glauca* [2 sampled (0.03% of planned 6600)] and *Xiphias gladius* [52 sampled (9% of planned 600)]: métier LLD_LPF targeting these species was not selected for sampling; individuals sampled are a consequence of the concurrent sampling strategy or of availability of time from the samplers to cover this extra métier; individuals sampled are a consequence of an opportunistic behaviour regarding other fishing gear types (LHP_FIF, LHP_LPF and LLS_DEF);
- iii) *Sarda sarda* [156 sampled (52% of planned 300)]: landings in small harbours with no sampling coverage;

IOTC (FAO 51+57)

In 2016, for the fishing ground IOTC (FAO 51+57), Portugal applied the métier based sampling strategy. There was 1 identified métier, labeled at level 6, for which fishing activity has been recorded during the reference period (see Table III.C.1). The information used for selecting these métiers was obtained based on the information that in this fishing ground the target species is *Xiphias gladius*, and the gear group is drifting longlines. No métiers have been merged in these fishing grounds (IOTC (FAO 51+57)). Table III.C.4 provides details on the planned number of trips to be sampled in 2016, according to the sampling strategy used by Portugal. The results of sampling in 2016, regarding trips per métier and length from catches, landings and discards by métier and species, are presented in Table III.C.3 and III.C.6, respectively.

In general, deviations from the sampling strategies outlined in Portugal's NP 2014-2016 (which is a rollover from the NP 2011-2013), in terms of the planned versus sampled number of fishing trips in IOTC (FAO 51+57), are due to the time lag between the reference years in the NP and the sampling year, and due to the fact that the number of vessels operating in this region has been greatly reduced in the recent years.

CECAF – Madeira (FAO 34.1.2)

Procedures to assign each individual fishing trip to a specific métier were conducted using the methodology described in the NP 2011-2013. The selection of the métiers was achieved using effort (fishing days), landings and the value of the landings from the reference years (2014-2015). Results from this selection are presented in Table III.C.1. Results of the implementation of the sampling of métiers are presented in Table III.C.3 and the métier sampling strategy employed is in Table III.C.4. These tables present the expected samples by métier (in accordance with the NP) and its achievement during 2016.

Table III.C.6. shows the total number of individual lengths measured from the landings by métier and species. Concerning this Table III.C.6., no length sampling of discards or unsorted catches was done due to the already mentioned fact of the non-implementation of the programme of observers on board in most of

the segments. In the case of the purse seine fishery the late beginning of the presence of observers on board only allowed the coverage of 2 fishing trips.

Achievement by métier:

Achievements by métier and the reasons for the deviations from aim are presented in Table IIIC3.

III.C.2 Data quality issues

ICCAT – Mainland (BF58)

In the fishing ground ICCAT – Mainland (BF58) both at-market and at-sea samplings (concurrent sampling) are conducted.

The purpose of at-market sampling is to obtain length distributions of fish landed at auctions by Portuguese tuna traps operating in this area. The Primary Sampling Unit (PSU) is auction*day (in specific ports). In the case of tuna traps, visit dates in each auction*quarter are spread somewhat systematically throughout the quarter in a way that covers all week-days where the tuna trap is active. In every auction*visit_date, observers attempt to sample a predefined number of vessel_sale_events. Each vessel_sale_event generally corresponds to the landings of one fishing event at the tuna trap. During the fishing season, after tuna quota is closed, fishing activity suspends until all tunas are sold, therefore, in some years it is difficult to carry out all planned sampling days. The data from ICCAT – Mainland (BF58) are stored in a local data base. Quality control to meet ICCAT requirements is carried out before data are submitted to ICCAT. All samples are checked by a coordinator before the input of data; all data introduced in the database are checked for syntax errors; a random check of 10% of the data is executed by inspecting the registered data for logical errors (e.g.: type of data and values range of the variables); length distributions are then connected with the market landings for future cross examinations.

The purpose of at-sea sampling is to obtain the species composition and length distribution of total catches (targeted and bycatch species, including landed catch and discards) from the Portuguese tuna traps operating in this area. The Primary Sampling Unit (PSU) is trip, and the vessel selection is quasi-random, from a set of cooperative vessels. The observer identifies, measures and determines the sex of every specimen from every haul. The observer also registers whether the specimen is alive or dead when captured and discarded (in case discard happens). All interactions with vulnerable fauna (e.g. sea-birds, sea-turtles and marine mammals) are recorded, as well as the conditions when they are released. The data from ICCAT – Mainland (BF58) are stored in a local data base. Quality control to meet ICCAT requirements is carried out before data are submitted to ICCAT.

ICCAT – Mainland (BIL94 A+B, BIL96, BIL97)

In the fishing ground ICCAT – Mainland (BF58) both at-market and at-sea samplings (concurrent sampling) are conducted.

The purpose of at-market sampling is to obtain length distributions of fish landed at auctions by Portuguese longline vessels operating in this area. The Primary Sampling Unit (PSU) is auction*day (in specific ports). In case of longlines, in each vessel_sale_event, the observers aim to individually measure and/or weight each specimen from every commercial species and commercial category. Some commercial species may not be available for sampling if they are frozen and packaged, then only the total landed weight is taken. The data from ICCAT – Mainland (BIL94 A+B, BIL96, BIL97) are stored in a local data base. Quality control to meet ICCAT requirements is carried out before data are submitted to ICCAT. All samples are checked by a coordinator before the input of data; all data introduced in the database are checked for syntax errors; a random check of 10% of the data is executed by inspecting the registered data for logical errors (e.g.: type of data and values range of the variables); length distributions are then connected with the market landings for future cross examinations.

The purpose of at-sea sampling is to obtain the species composition and length distribution of total catches (targeted and bycatch species, including landed catch and discards) from the Portuguese longline fleet operating in this area. The Primary Sampling Unit (PSU) is trip, and the vessel selection is quasi-random, from a set of cooperative vessels. The observer identifies measures and determines the sex of every specimen from every haul. The observer also registers whether the specimen is alive or dead when captured and discarded (in case discard happens). All interactions with vulnerable fauna (e.g. sea-birds, sea-turtles and marine mammals) are recorded, as well as the conditions when they are released. The data from ICCAT – Mainland (BIL94 A+B, BIL96, BIL97) are stored in a local data base. Quality control to meet ICCAT requirements is carried out before data are submitted to ICCAT.

ICCAT - Azores

Member States' programmes for 2016 were defined in the national proposals for 2011-2013 due to the roll-over of programmes on commencement of the European Maritime and Fisheries Fund in 2014. No amendments to national programmes were permitted and consequently, it was not possible to update it in terms of the planned number of trips to be sampled. The additional time required for concurrent sampling onshore continues to be a limiting factor. The time window required to undertake concurrent sampling often results in not all required species in the landing being measured during the period in which samples are available at the market resulting in incomplete samples.

Quality checks and validation procedures implemented are: (1) All samples are checked by a coordinator before the input of data; (2) All data introduced in the 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, like for example, type of data and values range of the variables; (4) Length distributions are then connected with the market landings for future cross examinations.

IOTC (FAO 51+57)

In the fishing ground IOTC (FAO 51+57) only at-sea sampling (concurrent sampling) is conducted, with the purpose of obtaining the species composition and length distribution of total catches (discards + landings) from the Portuguese longline vessels operating in this area. The Primary Sampling Unit (PSU) is trip, and the vessel selection is quasi-random, from a set of cooperative vessels. The observer identifies measures and determines the sex of every specimen from every haul. The observer also registers whether the specimen is alive or dead when captured and discarded (in case discard happens). All interactions with vulnerable fauna (e.g. sea-birds, sea-turtles and marine mammals) are recorded, as well as the conditions when they are released. Length sampling intensities is conditional to the concurrent sampling characteristics and depends on the catch composition. All the measurements are taken on observer trips, once an observer is onboard, the entire trip is sampled (i.e. sampling does not stop after a few hauls or fishing days, but lasts until the end of that trip). The volume of catches and catch composition are the reasons behind the variation in length sampling achievements among years. Several species are a by-catch, and thus the minimum number of fish to be measured/aged at national level cannot be planned in advance.

The decreasing number of vessels with capacity and willing to carry observers on board, and the fact that some vessels of the fleet are moving to the Pacific Ocean in recent years, implies a reduction in the sampling frame (cooperative vessels) and make the execution of the planned samplings difficult, what explains the deviations from the proposed sampling intensity.

The data from IOTC (FAO 51+57) are stored in a local data base. In order to meet the IOTC requirements, before the data are submitted to IOTC, quality control is carried out. These checks assure that the type of data and the range of the variables are correct. Checks on national data processing include monitoring achievements, trend analysis, quality indicators and non-response rates.

CECAF – Madeira (FAO 34.1.2)

Analysis of the fulfilment of the sampling objectives set for 2016 in the above mentioned tables show that the overall coverage was in accordance with these objectives. However, like in the previous years, a different situation result for the trips sampled on shore in comparison with the trips sampled on board (see Table III.C.3.). There was a good coverage of trip landings on shore in the most important métiers, in general over passing the initial number of trips planned. The oversampling achieved in the coverage of trip landings on shore was intended to overcome the impossibility, in 2016, of implementing the plan of observers onboard in most segments (with the exception of the purse seine fishery) due to administrative and budgetary constraints.

III.C.3 Actions to avoid deviations

ICCAT – Mainland (BF58)

Due to applying randomized sampling, and the primary sampling unit being no longer a métier but an auction*day or a trip that has been randomly selected, the métier coverage is proportional to their use by the fisheries. This implies that the completion of a planned number of samples by métier can no longer be the aim of a sampling program.

ICCAT – Mainland (BIL94 A+B, BIL96, BIL97)

Due to applying randomized sampling, and the primary sampling unit being no longer a métier but an auction*day or a trip that has been randomly selected, the métier coverage is proportional to their use by the fisheries. This implies that the completion of a planned number of samples by métier can no longer be the aim of a sampling program.

ICCAT - Azores

The difficulties that arise are communicated to the coordination of the program, being implemented adjustments throughout the year of sampling in order to improve the achievement rate. Nonetheless, bias occur due to reasons explained in section III.C.1 as well as limited fish handling by some of the fishing industry operators or changes in the regular landing procedure of some métiers. Efforts will be employed to overcome all these constraints observed in 2016, in order to raise the number of sampled trips and thus the number of specimens measured. Meetings with the industry in 2016 has improved access in some areas and these will continue into the future WP 2017-2019.

To achieve the number of trips to be sampled, efforts will be employed in order to overcome the lack of a sampler in Pico island or to appoint staff from neighbouring islands to the ones where the presence of this métier is more representative. This approach was implemented in 2016 but, due to very low tuna catches, the number of boats landing at the time of sampling was consequently less than desirable. In an experimental basis during 2017, length measurements will also be recorded in some auctions using an electronic system composed by a local unit for automatic image acquisition of fish boxes and a remote database to record the processed images using Fishmetrics system. It is expected to improve some efficiency in data handling and to provide greater quality assurance.

Regarding length sampling, Portugal believes that the sampling programmed in the work plan for 2017-2019 will overcome the issues appointed in section III.C.1.

IOTC (FAO 51+57)

The great reduction of the number of Portuguese longline vessels operating in this region in the recent years implies a reduction in the sampling frame (cooperative vessels). However, IPMA continues enhancing communication with stakeholders in order to minimize difficulties raised by the fishing industry operators and trying to reach its wide participation, including self-sampling cooperation.

As it was done in previous years, to overcome the difficulty of collecting information of the fisheries on board we made a considerable effort, using the technical resources from the institution, in the collection of information and concurrent sampling made in the fishing pier during the unloading of fish and also the cross references with logbooks.

III.D. Recreational Fisheries

NORTH ATLANTIC (ICES areas V-XIV and NAFO areas)

III.D.1. Achievements: results and deviation from NP proposal

Recreational fisheries in Portugal are limited to areas IX.a and X.

The national law applicable to recreational fishing was changed in 2014, regulating the accidental catch of salmon, European Eel and Sharks (*Carcharodon carcharias*, *Cetorhinus maximus*, *Lamna nasus*, *Helexanchus griseus*, *Carcharinus falciformis*, *Carcharinus longimanus*, *Alopias superciliosus*), which if caught, must be released outright. This means the ban on fishing for salmon by recreational fishermen is kept and reinforced.

With regard to fishing for sea bass by recreational fishermen, as mentioned before, based on scientific study conducted in 2011, is not to expect a significant impact of fishery carried aboard maritime tourist boats.

Following some scientific studies DGRM has started to estimate the catches of seabass according to the study in south coast (Erzini, K. *et al.*, 2008)², which determined that these catches represent 0.5% of the commercial landings of seabass.

III.D.2. Data quality issues

In 2016 estimates were based on a percentage of commercial landings of seabass. Further studies will be launched in 2017 to assure data quality, namely accurate percentage by region.

III.D.3. Actions to avoid deviations

In early 2014, in order to make it possible to carry out surveys in a comprehensive manner, a national law was published which requires the introduction of a contact telephone number at the time the license is issued. There is also an internet application that allows DGRM to collect and process information concerning the activity performed by recreational fishermen, based on voluntary participation and surveys.

The referred national law also seeks to simplify the licensing process and to create a channel of communication through SMS between the administration and fishermen that allows sending notices, swiftly and automatically, concerning closed seasons, fishing seasons, management measures applicable to certain species or other relevant information.

² Erzini K. *et al.*, 2008. Caracterização da pesca recreativa da costa sul e sudoeste de Portugal. Relatório Final, Projeto POCI/MAR/58157/2004, 127 pp.

This provides the fisheries administration with a comprehensive set of data on recreational fisheries.

Furthermore, as the activity of recreational fishing in Portugal remains unsystematically monitored, a preliminary study was developed, in 2016, by “Centro de Ciências do Mar e do Ambiente” in “Fundação da Faculdade de Ciências da Universidade de Lisboa” (MARE/FCUL), to obtain an overview on sea bass recreational fishing and to define a data collection methodology to this species.

With those outcomes, available in December 2016, DGRM will launch a pilot study to obtain consistent information on sea bass recreational fishing activity namely catches estimates, fishing areas and seasons, catch composition and released catches.

OTHER REGIONS (CECAF, ICCAT, IOTC)

III.D.1. Achievements: results and deviation from NP proposal

In 2016, there were no recreational fisheries in CECAF, ICCAT and IOTC areas directed to the species mentioned in appendix 4, table 3.

III.D.2. Data quality: results and deviation from NP proposal

There are no deviations from the NP proposal.

III.D.3. Actions to avoid deviations

Not applicable.

III.E. Stock-related variables

NORTH SEA AND EASTERN ARCTIC (ICES areas I, II)

III.E.1 Achievements: Results and deviation from NP proposal

Stock-related data is collected in connection with sampling of commercial sources (observer trips). All stocks sampled during 2016 for biological variables, age, length, weight and sex are gathered in table III.E.3, which provides an overview over the species by region/fishing ground/area/stock. There were no major deviations for the target species. Justifications for deviations are provided in Table III_E_3.

III.E.2. Data quality issues

Despite on-board concurrent sampling scheme, the on-board sampling conditions (only one observer, limited time, sampling the entire trip, sorting representative samples of target or priority species and of most abundant by-catch) leave no room to collect samples of less abundant and/or non-commercial fish. No major deviations from data required for stock assessment. Different quality control assessment analysis (quarterly and annual) are implemented on the data base. The checks assure the type of data and the range of the variables are correct. Checks on national data processing include monitoring achievements, trend analysis, quality indicators and non-response rates.

III.E.3. Actions to avoid deviations

As mentioned before, the fleet operating in ICES areas I and II also operates in NAFO area. In both regions sampling is carried out by samplers who remain on board throughout the period of the fishing trip, which can last from 2 to 3 months with likely short notice changes in the fishing behaviour and operation area. To avoid shortfalls Portugal is always trying to reach a wide participation of vessels which have not been sampled by observers before.

NORTH ATLANTIC (ICES areas IXa - Mainland and Xa – Azores, and NAFO areas 3LMNO and ICES areas XII, XIV and Va)

III.E.1 Achievements: Results and deviation from NP proposal

ICES area IXa – Mainland

Stock-related data are collected in connection with sampling of commercial sources (observer trips and harbour sampling) and on surveys. All stocks sampled during 2016 for biological variables, age, length, weight, sex, sexual maturity and fecundity are gathered in table III.E.3, which provides an overview over the species by region/fishing ground/area/stock that were sampled. The indications of the planned minimum numbers of individuals to be measured for the different variables are based on experiences with the Portuguese sampling scheme and survey catches until 2008. Even with the possibilities to adjust the numbers within the updates for the programme it is not always possible to predict accurately if these planned numbers are reachable and realistic.

ICES area Xa – Azores

In general, the sampling targets set in the NP2014-2016 proposal were met. However, in some cases, under or oversampling occurred. As sampling for length, weight, sex & maturity at age usually is performed on the same individual, the mentioned deviations are applicable to all these parameters, except if stated otherwise.

Reasons for exceeding or non-compliance with the objectives established in the NP are:

- 1) Reasons for oversampling
 - i) *Phycis blennoides*: it includes 10 length classes which raises up greatly the number of individuals sampled; greater availability of samples for purchase in harbors with sampling coverage and labs;
 - ii) *Raja clavata*: about 85% of the individuals sampled for sex-ratio are from market sampling once this information is easily collected along with the length frequency composition of the landings; although observers do not collect maturity information, at sea sampling for discards contributes with extra 13% sex-ratio-at-length; these data sources did not represent any additional costs for the national collection programme;
- 2) Reasons for shortfalls
 - i) *Aphanopus spp.*: in 2016, the azorean fleet did not fished for black scabbardfish, being the individuals available for sampling a by-catch from the set longline fishery for demersal species. Around 34,7 tonnes (97,7% total catch), were landed in one month by one boat from Madeira in a harbour without sampling coverage. Individuals landed were not available for purchase since the ship owner would buy its own fish;

- ii) *Centrophorus granulosus*: no individuals were available at market for biological sampling since it's a species with TAC 0; its absence in the discards and in the catches of the annual survey also contributed for a sampling intensity of 0% regarding stock-based variables;
- iii) *Molva dypterygia macrophthalma*: scarce presence at landings and most individuals landed already gutted, are the main reasons for the non-achievement of the planned number of individuals to be sampled;
- iv) *Mullus surmuleus* and *Zeus faber*: reduced landings, reflected the low market availability of individuals for purchase of samples;
- v) *Octopus vulgaris*: during the sampling year this species landings was reduced in ~59% when compared to the previous year and sampling from hand collecting was not planned (métier responsible for ~93% of total catch);
- vi) *Polyprion americanus*: individuals landed already gutted and the cost per kg of this species reached prices so high that prevented their purchase in order to achieve the planned number of fish to be sampled;

NAFO areas 3LMNO and ICES areas XII, XIV and Va

Stock-related data are collected in connection with sampling of commercial sources (observer trips). All stocks sampled during 2016 for biological variables, age, length, weight and sex are gathered in table III.E.3, which provides an overview over the species by region/fishing ground/area/stock. Justifications for deviations are provided in Table III_E_3. There is general rule for observers to collect stock-based variables of 10 fish per length class and area. If only very few length classes occur during a fishing trip, this rule can lead to a deviation from the planned.

III.E.2. Data quality issues

ICES area IXa – Mainland

No major deviations from data required for stock assessment. Different quality control assessment analysis (quarterly and annual) are implemented on the data base. The checks assure the type of data and the range of the variables are correct. Checks on national data processing include monitoring achievements, trend analysis, quality indicators and non-response rates.

ICES area Xa – Azores

Member States' programmes for 2016 were defined in the national proposals for 2011-2013 due to the roll-over of programmes on commencement of the European Maritime and Fisheries Fund in 2014. No amendments to national programmes were permitted and consequently, it was not possible to update it in terms of individuals to be measured.

Quality checks and validation procedures implemented are: (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 execute by inspecting the registered data for logical errors, like for example, type of data and values range of variables.

NAFO areas 3LMNO and ICES areas XII, XIV and Va

See section III.E.2 for Supra-region North Sea and Eastern Arctic (ICES areas I, II).

III.E.3. Actions to avoid deviations

ICES area IXa – Mainland

Regarding crustacean species, sampling directly at the auction by the staff has in general been very successful and cost effective. Portugal will continue with this sampling setup.

Regarding the other stocks, Portugal plans to keep following the fishing activity improving sampling when acquisition is subject of market availability.

Portugal remains focused on providing high-quality data to stock assessment working groups. Other stocks or parameters that are not directly relevant will have a lower priority. Workshops planned for 2017 will address the optimization of effective sample size for biological variables.

Regarding the augmentation of the general sampling level, Portugal reconsiders its sampling protocol in order to obtain sufficient samples, and plans to organize a Workshop for the following January 2017 aimed at discussing methods to determine the planned minimum number of individuals to be measured at the national level. During 2017, fish length measurements will be also recorded in some auctions, using, on an experimental basis, an electronic system composed by a local unit for automatic image acquisition of fish boxes and a remote database to record the processed images (Fishmetrics), which allows to conclude fish length measurements at a later stage.

ICES area Xa – Azores

Sampling intensity for biological variables has been greatly revised at the National WP 2017-2019 in order to implement achievable goals. Targets have been set so that they are attainable regarding the new scenarios that fisheries in the Azores faces (e.g., TACs, minimum sizes for an increasing number of species, fishing seasons closure, catch cycles with low nominal catches of most species). It is expected to overcome issues appointed in section III.E.1.

Length and weight measures at on-site sampling will continue to be implemented. It is expected with this measure to overcome shortfalls of weight-at-length for those species that are either too expensive to purchase or its scarce presence at landings reflects in the low efficacy in acquire them for sampling at the laboratory.

In an experimental basis during 2017, length measurements will also be recorded in some auctions using an electronic system composed by a local unit for automatic image acquisition of fish boxes and a remote database to record the processed images using Fishmetrics system.

NAFO areas 3LMNO and ICES areas XII, XIV and Va

See section III.E.3 North Sea and Eastern Arctic (ICES areas I, II).

OTHER REGIONS (ICCAT; IOTC (FAO 51+57); and CECAF – Madeira (FAO 34.1.2))

III.E.1 Achievements: Results and deviation from NP proposal

ICCAT - Mainland

All stocks sampled during 2016 for biological are gathered in table III.E.3. The majority of stock-related variables are obtained from sampling at sea. Sampling achievement is therefore totally dependent on the catch composition. This is the main reason for the down-sampling concerning sex-ratio-at-length and/or weight-at-length for *Isurus oxyrinchus* and *Prionace glauca*, which are often a by-catch of the longliner fleet, and for *Xiphias gladius*.

It is difficult to plan the number of individuals to be weighed on board. The use of weighing scales on board depends on vessels facilities and weather conditions. As fish (especially sharks) is landed in heavy blocks,

weight's sampling at the market is also unfeasible. This is the reason behind the deviations concerning weight-at-length for *Isurus oxyrinchus*, *Prionace glauca* and *Xiphias gladius*.

ICCAT - Azores

The at sea sampling for discards constitutes the only data source for *Squaliformes* species (TAC zero). In this programme, although observers do not collect maturity information, from the 2060 individuals measured, 98% were classified for sex representing no extra expenditure for the national data collection programme.

Due to low landing values, the LLD_LPF is not a métier selected for sampling in Azores, which compromises the access to individuals of *Isurus oxyrinchus*, *Prionace glauca* and *Xiphias gladius*. Individuals sampled are a consequence of an opportunistic strategy, every time samplers present at the market have a time window that allows them to sample other métiers besides the planned ones. In addition, it is difficult to get whole fishes for sampling.

Tuna species (i.e., *Thunnus obesus* and *Thunnus alalunga*) can reach high weight values per fish implying unsustainable costs for biological sampling. For that reason, the only data recorded were length and weight at landing with the exception of five small bigeye tunas and four atlantic bonito, that were purchased and complete sampling performed. *Thunnus thynnus* is not landed in Azores. The low catches and short fishing season in 2016, did not allowed the biological sampling at the tuna canneries for sex-ratio and maturity.

IOTC (FAO 51+57)

All stock-based variables are obtained from sampling at sea. Sampling achievement is therefore totally dependent on the catches of the species. Sampling is carried out by observers who remain on board throughout the period of the fishing trip, which can last from 2 to 3 months, with likely short notice changes in the fishing behavior.

CECAF – Madeira (FAO 34.1.2)

Table III.E.3 refers to the biological sampling carried out in 2016. Most of the samplings were done on shore, from purchased fish. Regarding the low percentage of achievement in *Aphanopus carbo* species (30%), the objectives set a few years ago were overestimated. The level of sampling achieved is in line with the need for a good statistical coverage of the biological variables without an excessive cost to purchase the fish for sampling.

Concerning the deep water sharks, no sampling was done in *Centrophorus squamosus* due to the unavailability of quota in 2016. Regarding the skipjack (*Katsuwonus pelamis*) low number of individuals were sampled due to the low landings of the species during 2016.

III.E.2. Data quality issues

ICCAT - Mainland

Deviations and reasons for deviations are explained in section III.E.1.

Different quality control assessment analysis (quarterly and annual) are implemented on the data base. The checks assure the type of data and the range of the variables are correct. Checks on national data processing include monitoring achievements, trend analysis, quality indicators and non-response rates.

ICCAT - Azores

Member States' programmes for 2016 were defined in the national proposals for 2011-2013 due to the roll-over of programmes on commencement of the European Maritime and Fisheries Fund in 2014. No amendments to national programmes were permitted and consequently, it was not possible to update it in terms of individuals to be measured.

Quality checks and validation procedures implemented are: (1) All samples are checked by a coordinator before the input of data; (2) All data introduced in database are checked for syntax errors; (3) A random check of 10% of the data is executed by inspecting the registered data for logical errors, like for example, type of data and values range of variables.

IOTC (FAO 51+57)

See section III.E.2 above for supra region Other Regions (ICCAT).

CECAF – Madeira (FAO 34.1.2)

Tables III.E.1 and III.E.2 summarises the average landings in reference period of 2011 - 2013 and the long term sampling of required stocks. Table III.E.3 summarises the sampling intensity for stock-based variables. The coverage achieved in the species considered was satisfactory in most species considering that the objectives set a few years ago were overestimated and the coverage of the most important species are enough for the needs without excessive costs to purchase the fish. No sampling was done in *Centrophorus squamosus* due to the unavailability of quota in 2016.

III.E.3. Actions to avoid deviations

ICCAT - Mainland

Shortfalls are related with weight and sex-ratio information, due to problems inherent in large pelagic fisheries: long fishing trips, vessel logistics and type of fish processing on board, and vessel's conditions. Sampling intensities depend on fishing behaviour. Proposed measures are the revision of the sampling intensity of some biological variables, and a workshop during 2017 for discussing methods to determine the planned minimum number of individuals to be sampled at the national level.

ICCAT - Azores

Sampling intensity for biological variables has been greatly revised at the National WP 2017-2019 in order to implement achievable goals. Targets have been set so that they are attainable regarding the new scenarios that fisheries in the Azores faces (e.g., TACs, minimum sizes, catch cycles with low nominal catches). It is expected to overcome issues appointed in section III.E.1.

In ICES Sub-area X, efforts will continue in order to collect weight@length information from tuna species directly at the auction sales. As for large pelagic fishes captured through drifting longline, shortfalls are due to problems inherent to this fishery in this region, namely: low number of vessels using this gear type and consequently low volume of landings, as well as specimens are usually landed processed (gutted). Meetings with the industry will take place in the future in order to have access to samples.

In an experimental basis during 2017, length measurements will also be recorded in some auctions using an electronic system composed by a local unit for automatic image acquisition of fish boxes and a remote database to record the processed images using Fishmetrics system.

IOTC (FAO 51+57)

See section III.E.3 above for supra region Other Regions (ICCAT).

CECAF – Madeira (FAO 34.1.2)

In 2016, the administrative procedure for carrying expenditure on the purchase of fish for biological sampling are now properly established and is assured the necessary budget, although difficulties in the administrative procedures in the beginning of the year delay the beginning of the biological sampling in the first months of the year.

III.F. Transversal variables

III.F.1. Capacity

III.F.1.1. Achievements: Results and deviation from NP proposal

As stated in our NP the collection of capacity data defined in DCF was achieved through Fleet register database and covers 100% of population (Mainland, Azores and Madeira fleets).

III.F.1.2. Data quality: Results and deviation from NP proposal

Results reflect the actual state of the fleet. There are no deviations from the NP proposal. Some numbers might not match the fleet register data. This is due to the recommendation to include any active vessel in the reference year and as a consequence DCF capacity includes some vessels that became active after January, 1st.

III.F.2. Effort

III.F.2.1. Achievements: Results and deviation from NP proposal

Mainland

As stated in our NP the collection of effort data defined in DCF was achieved through logbooks for vessels > 10m and through sales notes for vessels < 10m.

During 2015, all logbooks covering the vessels with a pattern of activity with more than one day, were computerised. This information covers all the activity in foreign grounds, landings in foreign ports and also information of larger vessels operating in national waters. Most vessels have now the electronic logbook, which provides a more updated information but with a different approach. This results in some different ways to account for the fishing days and days at sea. As a consequence time series may change after 2011.

For the remaining vessels, with one day trip and landings of fresh fish on mainland ports, the source of information for effort estimation are the sales notes. For effort estimation it is considered each auction sale as an effort day.

Between 2008 and 2009, a survey was carried out for small scales fisheries and a substantial amount of effort information was collected.

This information allows for the estimation of effort variables for small scale fisheries, according to the following methodology:

- Number of fishing operations: (For purse seiners) – It's considered one fishing operation per sales day;
- Number of nets: One net per fishing operation;
- Length of nets: Avg of length of nets x number of vessels x number of fishing days;
- Number of hooks: Avg number of hooks x number of vessels x number of fishing days;

- Number of pots and traps: Avg number of pots and traps x number of vessels x number of fishing days;
- Hours fished: Avg number of fishing hours per gear x number of vessels x number of fishing days;
- Soaking time: Same as Hours fished.

Therefore, for the mainland fleet all information to support effort estimation is collected, enabling to comply with rules laid down on the regulation.

III.F.2.2. Data quality: Results and deviation from NP proposal

Mainland

The deviations from the NP proposal are related with métiers for vessels < 10 m, due to the impossibility of subcontract of services in 2013, as stated in the previous section.

III.F.3. Landings

III.F.3.1. Achievements: Results and deviation from NP proposal

The information resulting from sale at wholesale fish markets, in the case of landings of fresh or refrigerated fish, complemented by the logbook landing declaration for all landings of frozen fish at Portuguese ports and all landings at foreign ports, makes it possible to achieve the aims of this parameter.

The geographical origin of landings was disaggregated in accordance with level 3 of Appendix I. This parameter was collected, in the case of logbooks, from the information stated in the landings declaration and, by other hand, in the case of 1st sales, was disaggregated by fishery at mainland Portugal, the Azores and Madeira Autonomous Regions, Spain and Mauritania (ICES statistical divisions VIII, IXa and X and CECAF 34.1.2 and 34.1.3).

Only the information collected from the 1st sale by auction meets the required specifications in terms of the assessment of the value of commercial landings with disaggregation and in compliance with the criteria set forth in the Regulation. Information is therefore available for all species landed at the wholesale markets in mainland Portugal and the Autonomous Regions. Remaining values were estimated based on the economic survey to the fleet.

The collection of data makes it possible to assess annual commercial landings of all stocks in accordance with the level 3 for geographical disaggregation indicated in Appendix I.

III.F.3.2. Data quality: Results and deviation from NP proposal

With regard to landings data for ports in the Autonomous Regions (Azores and Madeira), there has been an improvement in the level of disaggregation. Landings were included in the fisheries management database aggregated per month and, since 2015, their inclusion is being disaggregated to the vessel/day level.

Regarding deviations, there were none from the NP proposal.

III.G. Research surveys at sea

III.G.1. Achievements: Results and deviation from NP proposal

In 2016, Portugal conducted 4 research surveys at sea supported within the DCF, and participated in the Flemish Cap Groundfish survey conducted by Spain.

The achievements of the programmed surveys regarding their target objectives and the number of days at sea are given in Table III.G.1, and are described in this section, with maps of the achieved sampling activities. The naming of the surveys follows Appendix IX of Commission Regulation 2010/93/EU.

Full description of the surveys was provided in the PRT NP proposal.

As indicated in Table III.G.1, all the programmed surveys for 2016 were performed.

Flemish Cap Groundfish survey (FCGS)

The Flemish Cap Groundfish survey was carried out by Spain with the research vessel R/V Vizconde de Eza between 22/06/2016 and 23/07/2016. Portugal participated in this survey by providing staff (one technician). The 32 planned strata were sampled (Figure III.G.1 (A)), and the planned target of 181 hauls was achieved, all hauls being valid. There were no deviations in the achieved data collection, nor in the achieved number of days at sea, compared to what was planned in the NP. The data from the FCGS, are stored in the IEO data base.

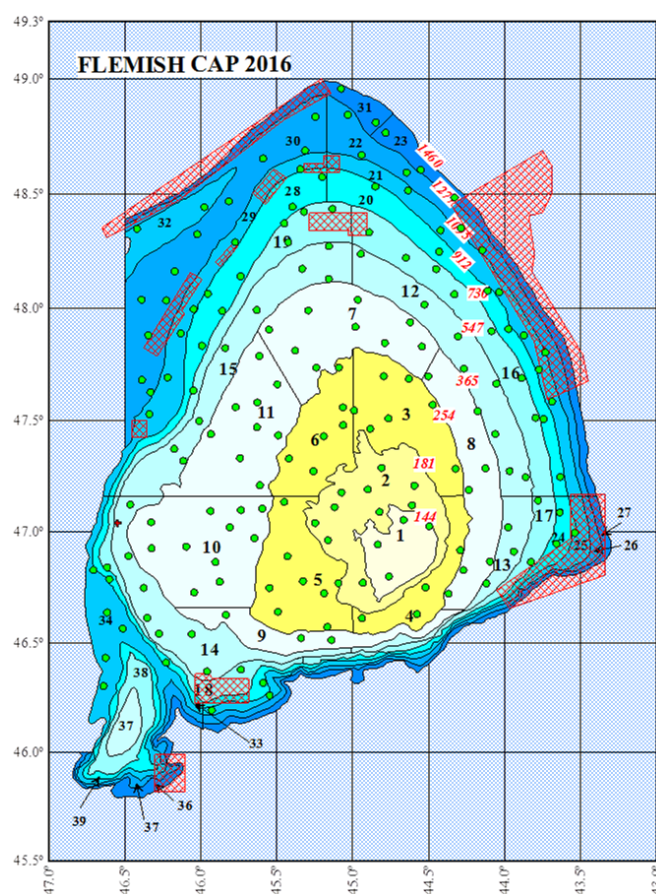


Figure III.G.1 (A): Flemish Cap Groundfish Survey, FCGS (RV Vizconde d'Eza). Sampling grid. Coral and sponge protection areas (red squares); Valid hauls (green circles).

Western IBTS 4th quarter (IBTS Q4)

The IBTS Q4 survey was conducted from 19/10/2016 to 18/11/2016 on the research vessel RV Noruega. Figure III.G.1. (B) shows the sampling grid and trawl stations of the survey. The planned number of days at sea (30) and the planned target of 96 hauls were achieved, with deviations of less than 10% in the achieved data collection compared to what was planned in the NP. These deviations are considered to be an acceptable margin for at-sea surveys, therefore, no justification needs to be provided. The data collected during the survey

are stored at DATRAS (<http://datras.ices.dk/Home/Descriptions.aspx>) and in the national database CRUZDEM. The survey data were as well submitted to ICES WGBIE, WGHANSA and WGWIDE to be used for stock assessment of hake, horse-mackerel and blue whiting.

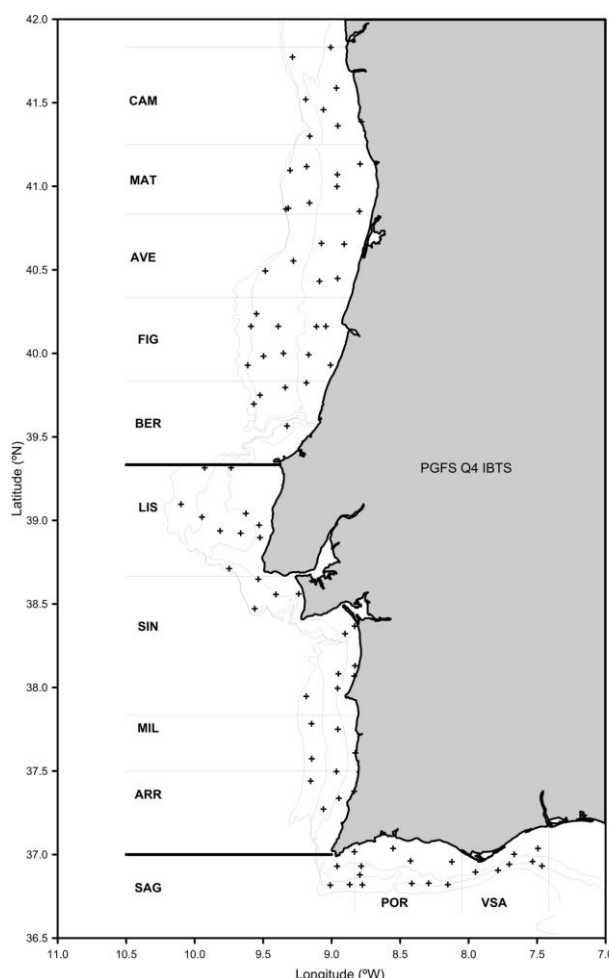


Figure III.G.1(B): Western IBTS 4th quarter (IBTS Q4). Sampling grid.

International Mackerel and Horse Mackerel Egg Survey (Triennial) (MEGS)

The MEGS survey was conducted from 11/03/2016 to 01/05/2016 on board RV Noruega, later than initially scheduled, concurrently to the Sardine, Anchovy, Horse Mackerel Acoustic Survey (see below). It was not possible to cover the northern most area (Western Galicia), therefore, only 42 out of the 48 planned transects have been effectively covered. Data coming from the International Mackerel and Horse Mackerel Egg Survey are stored in a national database. The data were sent to the ICES WGMEGS and WGWIDE. Refer to Figure III.G.1 (C) for the achieved CalVET + CTDF sampling stations and Figure III.G.1 (D) for the fishing stations.

In total, 393 plankton hauls and CTDF casts were conducted between the northern Portuguese- Spanish border and Cape Trafalgar, while 52 fishing hauls were carried out onboard the RV (16 hauls (31%) positive for horse mackerel), complemented with 21 samples from the commercial fleet. Eggs and adults data for mackerel were also obtained and sent to the WGMEGS.

Deviations from planned days at sea were 11%, and deviations from target activities were between 21% and 30%. The period of the survey, later than planned and towards the end of the reproductive season, may have influenced the estimates.

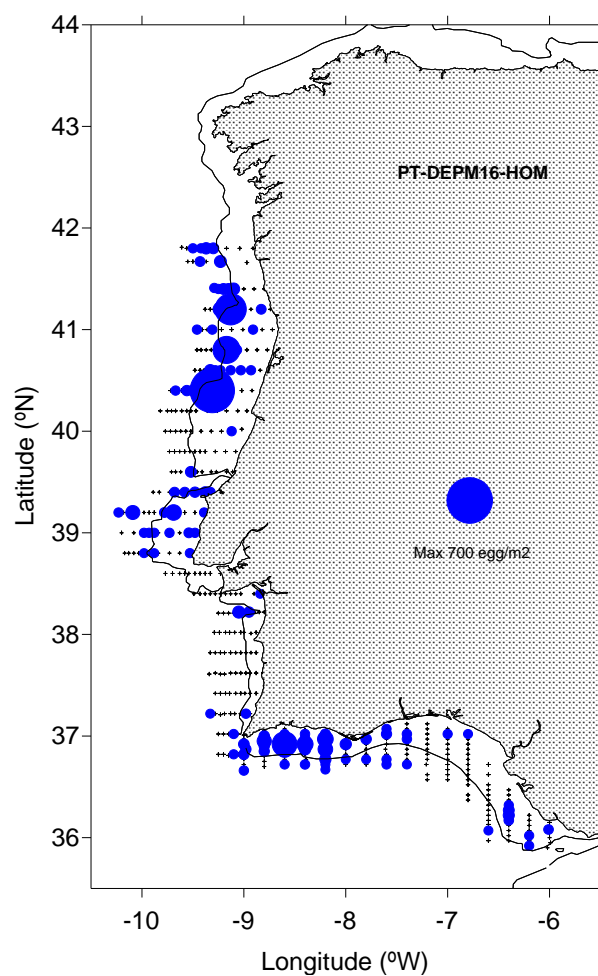


Figure III.G.1 (C): International Mackerel and Horse Mackerel Egg Survey (MEGS). Achieved CalVET + CTDF sampling stations (including in blue horse mackerel egg densities).

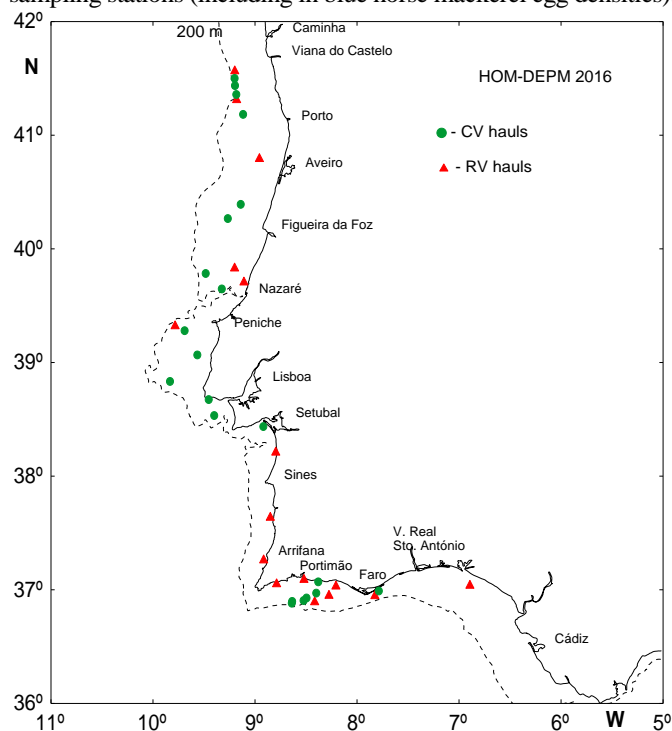


Figure III.G.1 (D): International Mackerel and Horse Mackerel Egg Survey (MEGS). Achieved fishing stations (RV: research vessel, CV: commercial vessel).

Sardine, Anchovy, Horse Mackerel Acoustic Survey

This survey was conducted from 11/03/2016 to 01/05/2016 on RV Noruega, with a time span of several weeks, between the beginning and the end of the survey (a total of 31 working days). Data coming from the Sardine, Anchovy and Horse Mackerel Acoustic survey are stored in a national database. Data were sent to the ICES WGHANSA and used for the assessment of sardine and anchovy. Refer to Figure III.G.1 (E) for sampling radials and to Figure III.G.2 (F) for fishing stations. Deviations from planned days at sea are in the margin of 10%. There are no shortfalls for the sampling target activities.

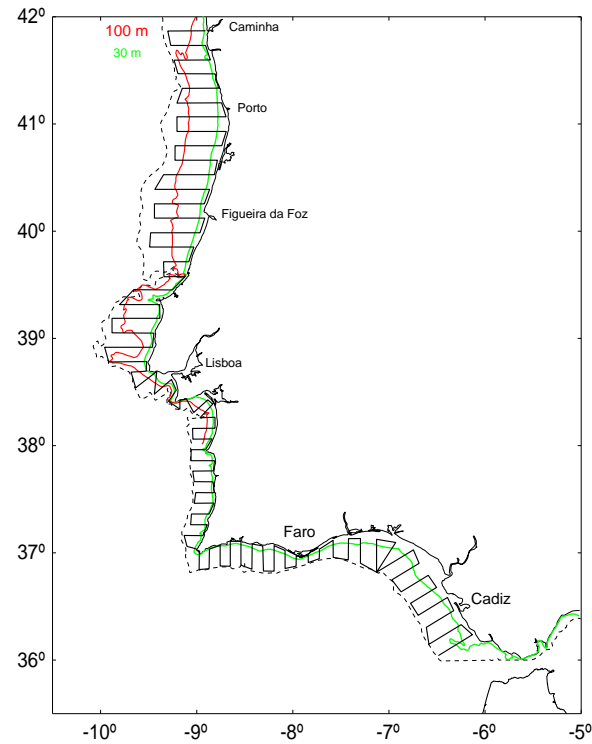


Figure III.G.1 (E): Sardine, Anchovy and Horse Mackerel Acoustic Survey. Sampling radials.

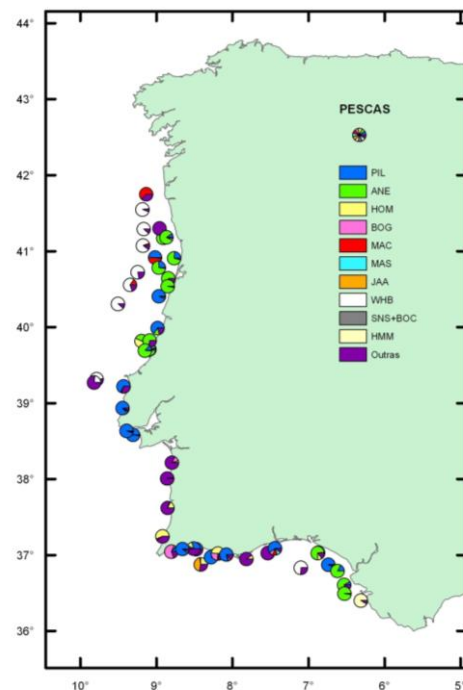


Figure III.G.1 (F): Sardine, Anchovy and Horse Mackerel Acoustic Survey. Species composition by fishing station.

Sardine DEPM (Triennial)

This survey was not carried out in 2016, as it is conducted triennially. The next survey year is 2017.

Nephrops TV Survey Offshore Portugal (UWTV (FU 28-29))// *Nephrops* Survey Offshore Portugal NepS (FU 28-29)

For reasons explained already in last year AR, Portugal recommends that the revised DCF adopts the following designation: ***Nephrops* Survey Offshore Portugal NepS (FU 28-29)**. This survey is internationally coordinated within WGNPS. The survey was conducted from 06/06/2016 to 02/07/2016 on RV Noruega. Data from *Nephrops* bottom trawl survey/TV Survey Offshore Portugal, UWTV (FU 28-29) survey are stored in the CRUZDEM national database. The abundance/biomass indices from the bottom trawl sampling stations were sent to the ICES WGBIE and used on the assessment of *Nephrops*. Refer to Figure III.G.1 (G-a) for sampling grid and fishing stations, and to Figure III.G.1 (G-b) for Norway lobster biomass index spatial distribution. Deviations from planned days at sea and target activities are within the margin of 10%.

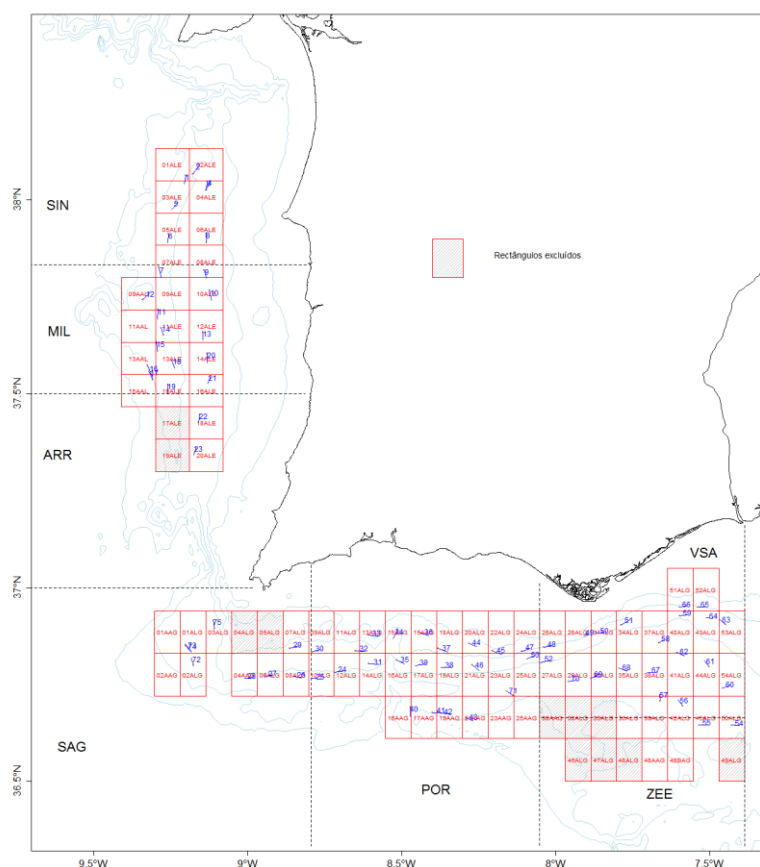


Figure III.G.1 (G-a) *Nephrops* TV Survey Offshore Portugal/*Nephrops* Survey Offshore Portugal NepS (FU 28-29).
Sampling grid and trawl stations.

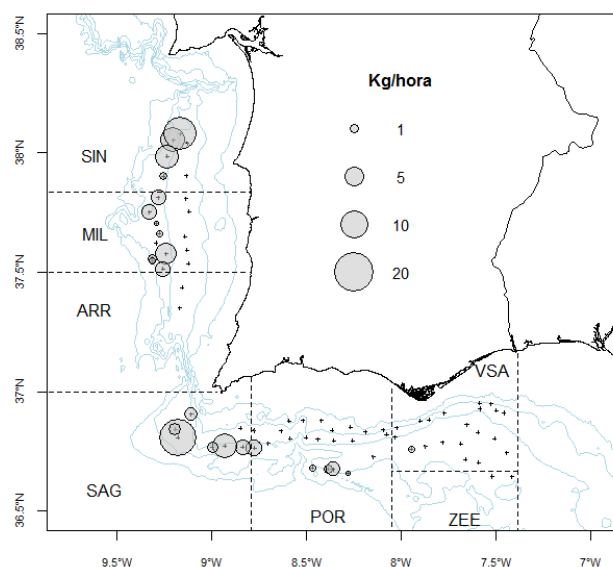


Figure III.G.1 (G-b) *Nephrops* TV Survey Offshore Portugal/*Nephrops* Survey Offshore Portugal NepS (FU 28-29). Norway lobster biomass index spatial distribution.

III.G.2. Data quality: Results and deviation from NP proposal

Generally, the surveys follow the international manuals set up for the different research surveys at sea. These manuals therefore establish the data quality. No significant data quality problems or deviations from the NP occurred in 2016.

III.G.3. Actions to avoid shortfalls

At the time of this report, Noruega RV is already repaired and the technical implementation of research surveys at sea takes place within the planned and démarches have been pursued with the Foreign Affair Ministry for the provision of authorization in due time to carry on the scientific survey in Spanish waters.

IV. MODULE OF THE EVALUATION OF THE ECONOMIC SITUATION OF THE AQUACULTURE AND PROCESSING

IV.A. Collection of data concerning the aquaculture

IV.A.1. Achievements: results and deviation from NP proposal

In 2016, the surveys used to collect data for EUROSTAT were also used to collect economic data for DCF. The Portuguese Directorate General for Natural Resources, Security and Maritime Services (DGRM) has registered the total population of farms and companies engaged in aquaculture production in Portugal. It is mandatory for all aquaculture producers in Portugal to report the production in volume and value each year at the farm level. The same operation fulfils the administrative needs for information, EUROSTAT and DCF. This operation is carried out annually between January and April, based on a census.

Although a census is applied, the response rate has been decreasing over the years. The administration has done extra-effort for collecting data and is also enforcing the response with some measures that include sanctions if production is not delivered one year and, may include license removal in case of non-response for 2 years. As result, for bottom units that constitutes the majority of the aquaculture structure (over 1327 units on 2014) and, traditionally, the segment with the lowest response rate, the response rate increased from 38% to 46%, in 2014.

In 2014, the Portuguese Aquaculture sector was composed of 1428 farms that employed 2357 workers, of which 479 were women and 1878 were men, in a proportion of 1:4. The sector is dominated by small companies with less than 5 employees. 98% of the Portuguese companies had less than 5 employees.

IV.A.2. Data quality: results and deviation from NP proposal

Due to the low response rate, estimates were made and quality indicators calculated. The quality indicators are expressed in table IV.A.3. The low response rate achieved for some variables is due to the nature of the aquaculture structure. On bottom units represent 93% of total aquaculture units. These units consist mainly of a small piece of land, usually less than 1 ha, with low level investment and simplified cost structure. A simplified questionnaire and the production is estimated according to a methodology defined in cooperation with the National Statistics Institute. Capital variables have a higher variation as they are more difficult to answer (and usually have lower response rate, even when a questionnaire is answered).

IV.A.3. Action to avoid deviations

To forfeit the decreasing response rate, an extra effort has been made, with some positive results. Due to national regulation mandating the answering of the survey, it is possible for the administration to enforce some legal measures, as applying fines and revoking licenses. Letters to the establishment owners were sent explaining the consequences of non-answering the questionnaire, increased phone calls, reinforcement by the administration staff when on-site inspections, requirements of the questionnaire in order to access public funding for new projects.

IV.B. Collection of data concerning the processing industry

IV.B.1. Achievements: Results and deviation from NP proposal

NP states that processing industry data were to be collected by NSI (National Statistics Institute). We received the 2014 data from NSI. The sources of information are: Structural Business Statistics (SBS) and SUT- Supply and Use Tables (Intermediate consumption by product and by industry).

Under SBS it is not possible to collect data on Depreciation of Capital. SBS also does not collect unpaid labour or FTE by gender. However there is sufficient information available in order to make estimates for these variables.

FTE by gender will be calculated using the following formula:

$$\text{FTE}(\text{by gender}) = \text{TOTAL_FTE} \times \text{gender_employed} / \text{total_nb_employed}$$

Where:

TOTAL_FTE = Total FTE in the reference year

Gender = Male/Female

Gender_employed = Number of males/females employed in the reference year

Total_nb_employed = Total number of person employed in the reference year

IMPUTED VALUE OF UNPAID LABOUR = UNPAID_LABOUR \times AVG_WAGE

Where:

UNPAID LABOUR = Number of unpaid persons employed (SBS: S16120)

AVG_WAGE = Total_wages/Total_employees

IV.B.2. Data quality: Results and deviation from NP proposal

Quality under SBS and SUT is assured by National standards, guaranteed by NSI and in compliance with Eurostat rules of quality.

However it is not possible to provide quality indicator such as coverage rate or CV as they are not defined for these statistical procedures (e.g., no sample is defined as administrative data from fiscal declarations is used by NSI)

IV.B.3. Actions to avoid deviations

Procedures were developed in order to obtain some of the missing variables from SBS (Imputed value of unpaid labour, FTE by gender) but it was not possible to obtain the variable “Depreciation of Capital”. A meeting was planned with NSI in order to study the feasibility of the calculation of this variable by the Institute. However, due to the changes in EU multiannual programme for 2017-2019, allowing data on the processing industry to be collected on a voluntary basis, Portugal decided not to include those sets in the future.

V. MODULE OF EVALUATION OF THE EFFECTS OF THE FISHING SECTOR ON THE MARINE ECOSYSTEM

V.1. Achievement: Results and deviation from NP proposal

The data required for the calculation of indicators 1, 2, 3, 4 as defined in Commission Decision 2010/93/EU are collected through the research surveys. These data have been collected through the annual surveys carried out by IPMA. The surveys are described in section III.G.1. Data on species, length frequencies and abundance was collected from all hauls including individual parameters such as age, length, sex and maturity from the target species of the survey following the sampling levels established in the manuals for the respective survey. The spatial and temporal coverage of data collection for the evaluation of effects of the fishing sector will consist of sub-area IXa. No deviations occurred in 2016.

Relatively to DCF indicators 5 (distribution of fishing activities), 6 (aggregation of fishing activities) and 7 (areas not impacted by mobile bottom gears) preliminary analyses were made in 2011. No deviations occurred in 2016.

The data required for the calculation of indicator 8 are collected on-board of the commercial vessels monitored by IPMA since 2004. No deviations occurred in 2016.

In what concerns indicator 9, the fuel consumption (both quantity and value) was estimated using data from economic surveys and crosschecked with administrative data. Values of landings, total and per commercial species were obtained from sales notes. Fuel consumption was obtained per fleet segment and year. Fuel consumption by quarter and métier was obtained as a proportion of the total effort days spent by métier and quarter in relation to the total fleet segment and year.

VI. MODULE FOR MANAGEMENT AND USE OF THE DATA

VI.1. Achievements: results and deviation from NP proposal

VI.1.1 Management of data

As stated in the NP 2014-2016, primary fisheries data, whether transversal, economic or biological, is scattered among the different databases standing in the five Institutions engaged in National Programme. Mechanisms for quality control assessment and validation procedures are executed in each one of the Institutions. The implementation of the new IPMA Database (open source Database management system) for storage and management of all biological data collected by IPMA (on-board, at-market and survey sampling) is expected in 2017.

The following developments achieved in 2016 regarding economic and transversal variables were maintained.

1. Fishing Fleet Database

- The new module created in 2013 was updated with new information in 2016 and its structure improved.
- Implementation of additional validations in order to improve data quality.

2. Auction's sales

Register of 2016 daily auction sales of Azores and Madeira in the same database as mainland.

VI.1.2 Data transmission

All the data sets used to support scientific analysis in ICES, NAFO, ICCAT, IOTC, STECF and DG MARE were organised, analysed and transmitted. The commission has asked for comments on perceived shortfalls and our responses were submitted.

DCF economic data are used as primary source for the national fleet report.

VII. LIST OF ACRONYMS AND ABBREVIATIONS

AR	Annual Report
CECAF	Committee for the Eastern Central Atlantic Fisheries
CV	Coefficient of Variance
DGRM	Direção Geral de Recursos Naturais, Segurança e Serviços Marítimos/Directorate General for Natural Resources, Safety and Maritime Services
IMAR/DOP	Departamento de Oceanografia e Pescas da Universidade dos Açores/Oceanographic and Fisheries Department of the University of Azores
DRPM	Direção Regional das Pescas da Madeira/Regional Directorate of Fisheries of Madeira
EEZ	Exclusive Economic Zone
GES	Good Environmental Status
GFCM	General Fisheries Commission for the Mediterranean
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
IPMA	Instituto Português do Mar e da Atmosfera/Portuguese Institute for Sea and Atmosphere
IOTC	Indian Ocean Tuna Commission
MSFD	Marine Strategy Framework Directive
NAFO	Northwest Atlantic Fisheries Organization
NP	National Programme
PNAB	Programa Nacional de Amostragem Biológica
RAA	Região Autónoma dos Açores/Autonomous Region of Azores
RAM	Região Autónoma da Madeira/Autonomous Region of Madeira
UAç	Universidade dos Açores/University of Azores

VIII. COMMENTS, SUGGESTIONS AND REFLECTIONS

No comments.

IX. REFERENCES

Duarte, R., Azevedo, M., and Afonso-Dias, M. 2009. Segmentation and fishery characteristics of the mixed-species multi-gear Portuguese fleet. *ICES Journal of Marine Science*, 66: 594–606.

Erzini K. *et al.*, 2008. Caracterização da pesca recreativa da costa sul e sudoeste de Portugal. Relatório Final, Projeto POCI/MAR/58157/2004, 127 pp.

X. ANNEXES

Annex 1. Methodological document on the estimation of socio-economic data.

1. Description of methodologies used to choose the different sources of data

Data sources used for the estimation of economic variables are administrative data, logbooks, sales notes and surveys carried out following a stratified random sampling strategy. For social variables, the data are collected together with the economic survey adapting the questionnaire form. 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 1st January of the reference year, therefore the matching of sources is assured.

2. Description of methodologies used to choose the different types of data collection

Different type of data collection was applied per variable and fleet segment. Variables related with fleet operations and fleet characteristics are collected from the national administration database, from sales notes or even logbooks with a census methodology. Concerning economic variables, data were collected by questionnaires.

3. Description of methodologies used to choose sampling frame and allocation scheme

For Madeira region, economic and social data collection is done by census, while for Azores and mainland a stratified random sampling is applied.

In order to comply with new demands and to obtain more accurate estimates, Portugal established an uniform fishing fleet segmentation between economic and biological data, based on métier level 6. Allocation of vessels that performed fishing operations in more than one supra region was made according to the criteria of days of activity. In this situation we can find the longline 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 representativity to be run independently, are in these circumstances.

For sample selection the criteria are the sample size by segment (minimum of 30 vessels per segment); number of vessels by segment (census for segments with less than 15 vessels).

4. Description of methodologies used for estimation procedures

The methodology used for the estimation of most of the variables is based on the imputation of averages per fleet segments. With the raising in importance of the economic results, improvements on the methodology are previewed in order to use more of the available administrative data. The objective is to combine administrative data with surveys answers to modelling, in order to achieve better quality with the available data. This approach has been tested with variable “Energy costs”.

Other specific methodologies are used for the calculation of variables: capital values, capital costs and FTE.

The value of fixed assets and the capital costs are estimated processing data of the vessel register, and according to the methodology suggested by the study on “evaluation of the capital value, investments and capital costs in the fisheries sector” (No FISH/2005/03).

In the year 2016, in order to be adjust the inputs for PIM methodology to the reality of the national fishing fleet, the age attributed to the lifetime of the hull and engine, was reviewed considering that useful life is dependent on the

vessel length:

	<i>Hull</i>		<i>Engine</i>	
	<i>Old</i>	<i>New</i>	<i>Old</i>	<i>New</i>
VL0012	25	20	10	10
VL1218	25	30	10	18
VL18XX	25	30	10	24

According to the capital study, the estimation of the capital value (GCS) consisted of three steps:

A. Specification of the composition of the active fleet by age (fleet register).

The specification of the composition of the active fleet by age has been done by processing the fleet register.

B. Estimation of price per unit of capacity (GT).

In order to apply the PIM (perpetual inventory method) and in absence of other possibilities, the price per unit of capacity is estimated having in mind the price for building new vessels (replacement values). Those prices for 2011 were:

- Small scale fleet segment = 21 050,00euros/GT;
- Polyvalents segment > 12 meters = 47 250,00euros/GT0,7;
- Trawl segment = 25 820,00 euros/GT0,8;
- Seiner segment = 15 170,00 euros/GT.

C. Calculation of the values of each vintage of the fleet at current prices.

After (1) and (2) we are able to estimate the Gross capital stock, the depreciated replacement value, and all the others variables. Inactive vessels are considered in the evaluation of the capital value and capital costs.

For calculation of FTE, survey information is collected about:

- Number of months of activity;
- Number of days of activity;
- Average number of working hours per day;
- Number of workers per month/gender/type of employment (partial/full time);
- Number of unpaid workers.

The number of days of activity is gathered from logbooks and auctions.

5. Description of methodologies used on data quality

The sample size for each fleet segment is determined by statistical procedures, targeting the precision level required by DCF for the variable income of the previous year ($CV < 5\%$). To mitigate the non-responses, the CV is increased to 20%.

Before the estimation methodology some quality checks are run. The collected values for each variable are plotted by fleet segment, and for extreme values, a direct contact with the respondent is established.

On the other hand, the same vessels can have, from year to year, huge variations for some of the variables that were expected to remain relatively stable, e.g.: fixed costs, due to the change of respondents and different interpretations for the same questions. Extreme values are compared with previous available answers for the same vessel, to provide more information during the contact with the respondent.

In both cases, if the extreme value is noticed as failure on the fulfilment, correction is made on the data. Otherwise, the value is considered an outlier.

Annex 2. Agenda and minutes of the National Coordination Meeting.



Programa Nacional de Recolha de Dados da Pesca - 2016
Data Collection Framework - 2016

Reunião de Coordenação Nacional – 30 e 31 de março de 2016
(National Coordination meeting – 30-31 March 2015)

09:30 – 17:30

Local (*place*): Auditório do Edifício-Sede da DGRM

Ordem de Trabalhos 30 Março
Agenda 30 March

1. Boas vindas e aprovação da Ordem de Trabalhos
Welcome and adoption of the agenda
2. PNRD – 2014
 - a. Financiamento sob o novo FEAMP – Ponto de situação sobre legislação nacional
Funding through EMFF Information – state of play national legislation
3. PNRD – 2015
 - a. Relatório anual (alterações introduzidas e calendário)
Annual report (changes and dates)
4. Atualização do Regulamento (CE) 199/2008
Update of Council Regulation 199/2008
5. Programa de trabalho e participação em reuniões 2016
Data collection and meetings in 2016
6. EU MAP e programa de Trabalho PT 2017
EU MAP e PT Working Plan 2017
7. Outros Assuntos
Other matters

Ordem de Trabalhos 31 Março
Agenda 31 March

1. Plano de Ação para a Recolha de Dados –Ponto de situação obrigações 2016
Action Plan for Data Collection – State of play of national obligations for 2016
2. Harmonização de conceitos e metodologias entre os Parceiros do PNRD – elaboração de linhas de orientação metodológica
3. Monitorização da execução técnica do Programa Nacional de Variáveis Biológicas - indicadores trimestrais de avaliação da execução

RELATÓRIO

REUNIÃO DE COORDENAÇÃO NACIONAL - PROGRAMA NACIONAL DE RECOLHA DE DADOS (PNRD)

LOCAL: DGRM-LISBOA

DATA: 30 e 31 de março de 2016

PRESENCAS: DGRM; IPMA; DRPESCAS MADEIRA; DRPESCAS AÇORES; DOP/IMAR DA UNIVERSIDADE AÇORES – (lista de presenças-anexo I)

Esta reunião realizou-se nos termos previsto no nº 4 do artigo 25º do Regulamento (UE) nº 1380/2013, relativo à Política Comum das Pescas. Em resposta ao convite formulado à DGMARE para estar presente, a mesma propôs uma ligação vídeo ou áudio. Não sendo esta via possível, para a DGRM, tentou-se uma ligação telefónica com a funcionária da DGMARE (Venetia KOSTOPOULOU) que não se concretizou por ausência da mesma devido aos recentes acontecimentos na Bélgica. Foi seguida a ordem de trabalhos (anexo II) sendo de realçar o seguinte:

1. Boas vindas e aprovação da Ordem de Trabalhos

Foi acordado incluir no ponto 6 da Ordem de trabalhos a resposta ao questionário do projeto-piloto FishPi.

2. PNRD – 2014

Financiamento sob o novo FEAMP – Ponto de situação sobre legislação nacional

A Subdiretora-Geral da DGRM, Ana Rita Berenguer, descreveu a forma de financiamento do PNRD, no quadro do FEAMP. Cada Parceiro apresentará à Unidade de Gestão uma candidatura com matriz idêntica à dos restantes projetos. As candidaturas corresponderão ao período 2014-2016 e, após submissão do termo de aceitação, pode ser solicitado um adiantamento de 50% do valor do apoio correspondente aos 3 anos e, em paralelo, solicitar pagamento de despesas realizadas.

A DRPAçores questionou sobre a forma de pagamento da comparticipação de 20% da comparticipação nacional. A Subdiretora-Geral da DGRM indicou que, em princípio, cada entidade tem de ter inscrita no seu orçamento a verba correspondente a essa comparticipação, como no modelo de financiamento anterior. Durante a reunião tomou-se conhecimento da publicação da Portaria que regulamenta o regime de apoio à recolha de dados da PCP (Portaria nº 63/2016, DR série I de 31-03-2016).

3. PNRD – 2015

Relatório anual (alterações introduzidas e calendário)

A coordenadora lembrou a obrigação de apresentação do relatório técnico à Comissão Europeia até ao próximo dia 31 de maio, tendo já sido enviados os respetivos *templates*. Foi salientado que, nas tabelas, há agora uma coluna para comentários a ser utilizada para informação que anteriormente se incluía no texto do relatório.

Foi considerado que se mantém as atuais interrogações e foram avaliadas as obrigações dos Parceiros em termos de preenchimento das tabelas do relatório.

Após envio pelo IPMA à DGRM (Carlos Moura) das tabelas III_C_1 e III_C_3 para serem completadas, estas serão devolvidas até 22 de abril. Até 13 de maio, todos os parceiros enviarão à coordenadora as tabelas e o texto do relatório técnico.

4. Atualização do Regulamento (CE) 199/2008

A coordenadora fez o ponto de situação da revisão do Regulamento (CE) 199/2008, cuja proposta de compromisso irá a Conselho de Ministros da UE no próximo dia 11 de abril. Os Parceiros nacionais foram, oportunamente, consultados sobre o presente compromisso. Foram destacados como principais consensos alcançados, desde o início dos debates em junho de 2015:

- Eliminação dos “atos delegados” que atribuíam competência à Comissão em diversas matérias. Estes foram substituídos por “atos de implementação”;
- Proteção de dados individuais, prevendo a anonimização dos mesmos;
- Distinção entre pedidos de dados, distinguindo entre os que se destinam ao aconselhamento científico das pescas e os destinados a outros fins;
- Distinção entre os prazos para fornecimento dos dois tipos de dados atrás referidos, permitindo flexibilidade ao Estado Membro para fixar um prazo razoável para os segundos;
- Possibilidade de cobrança caso existam custos adicionais por dados solicitados destinados a outros fins que não o aconselhamento científico.

5. Programa de trabalho e participação em reuniões 2016

A coordenadora referiu que, ao contrário do que havia acontecido no ano passado, não tinha conhecimento da lista de reuniões previstas para 2016, eventualmente por se tratar, agora, de reuniões cuja decisão de participação cabe aos Estados Membros enquanto que no passado era a Comissão que recomendava a lista das mesmas.

A representante do IPMA (Manuela Azevedo) referiu que tem conhecimento das reuniões do ICES na qualidade de delegada nacional e que poderia disponibilizá-la.

A coordenadora solicitou que todos os Parceiros lhe enviassem a lista das reuniões onde deveriam participar.

Solicitou, igualmente, que lhe fosse sempre dado conhecimento, da data de resposta de cada *data call*.

6. EU MAP e programa de Trabalho PT 2017

A coordenadora referiu que, no próximo dia 2 de maio, terá lugar em Bruxelas a 2ª reunião, na qual a DGRM participaria, mas onde poderiam participar caso entendessem relevante. A colega Dália Reis, do IMAR, ficou de enviar a apresentação da COM mais recente sobre o EU MAP. Ainda não está claro se o programa de recolha de dados de 2017 em diante se denominará EU MAP ou mantém a designação atual (DCF).

Pelo IMAR (Dália Reis) foi referido que não será, de futuro, concluída informação recolhida ao abrigo de outros regulamentos

Foi também destacado pelo IMAR (João Gil) o elevado custo que poderá representar a recolha de dados da pesca recreativa. A DGRM (Carlos Moura) informou estar para breve o lançamento de um concurso para um estudo-piloto para estimativa da importância da pesca recreativa.

7. Outros Assuntos

Foram dadas respostas conjuntas ao questionário do projeto-piloto FishPi (Regional cooperation in fisheries data collection, MARE/2014/19), no contexto da coordenação regional da recolha de dados, tendo a signatária ficado de as enviar a todos os Parceiros para verificação e eventuais sugestões de

alteração que deverão ser recebidos antes da data limite para envio da resposta ao questionário (14 Abril 2016).

REUNIÃO DO DIA 31 DE MARÇO

No dia 31 de março, procedeu-se à definição de duas matérias constantes do plano de ação para a recolha de dados: "Harmonização de conceitos e metodologias entre os Parceiros do PNRD – elaboração de linhas de orientação metodológica"; "Monitorização da execução técnica do Programa Nacional de Variáveis Biológicas -indicadores trimestrais de avaliação da execução".

Os Parceiros enviarão ao colega Carlos Moura os respetivos algoritmos de segmentação da frota em metiers e o resultado obtido com base nos dados de 2015 (metier atribuído a cada embarcação). O objetivo é comparar os níveis de concordância entre os algoritmos usados pelos parceiros com vista à harmonização da metodologia. Foram adotados indicadores para a monitorização técnica baseados em: i) nº de amostragens em lota, ii) nº de amostragens a bordo; iii) nº de campanhas de investigação e iv) transmissão de dados. A monitorização será trimestral e baseada em taxas de execução para itens i)-iii) e em pontuação (score) para item iv). A signatária ficou de enviar o documento para verificações finais.

Considerou-se necessário realizar uma reunião em setembro (data provisória: 12-13 set) para discutir o resultado do exercício de segmentação e o Plano de Trabalhos da Recolha de Dados (PNRD) para o período 2017-2020/23 que terá que ser enviado à COM até 31 de Outubro 2016, contemplando aspetos que venham a ser acordados nos planos regionais, conforme previsto no novo regulamento da Recolha de Dados (atualização do Reg (CE) 199/2008).

Lisboa, 4 de abril de 2016

Emília Batista
Correspondente Nacional