Responsible National Bodies for implementation of Work Plan

**National Coordination:**

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

**Participating Entities:**

* Direcção-Geral dos Recursos Naturais, Segurança e Serviços Marítimos/Directorate General for Natural Resources, Safety and Maritime Services (DGRM)
* Instituto Português do Mar e da Atmosfera / Portuguese Institute for Sea and Atmosphere (IPMA)
* Direção Regional das Pescasda Região Autónoma dos Açores/Regional Directorate for Fisheries in Azores(DRP/RAA)
* Direção Regional do Mar da Região Autónoma da Madeira/ Regional Directorate of the Sea in Madeira(DRM/RAM)

Regulation (EU) 2017/1004 of 17 May 2017 of the European Parliament and the Council

on the establishment of a Union framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy and repealing Council Regulation (EC) No 199/2008

Commission Implementing Decision (EU) 2019/909 of 18 February 2019

establishing the list of mandatory research surveys and thresholds for the purposes of the multiannual Union programme for the collection and management of data in the fisheries and aquaculture sectors

Commission Delegated Decision (EU) 2019/910 of 13 March 2019

establishing the multiannual Union programme for the collection and management of biological, environmental, technical and socioeconomic data in the fisheries and aquaculture sectors

Commission Implementing Decision (EU) 2016/1701 of 19 August 2016

laying down rules on the format for the submission of work plans for data collection in the fisheries and aquaculture sectors.

Commission Implementing Decision (EU) 2018/1283 of 24 August 2018

laying down rules on the format and timetables for the submission of annual data collection reports in the fisheries and aquaculture sectors.

**Portugal Annual Report for data collection in the fisheries and aquaculture sectors**

2021

Version [1]

[Lisbon, May 31, 2022]

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Section 1: Biological Data

Text Box 1C: Sampling intensity for biological variables

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| General comment: This box fulfils paragraph 2 point (a)(i)(ii)(iii) of Chapter III, of the Annex of the Delegated Decision (EU) 2019/910 and Chapter I of the Implementing Decision (EU) 2019/909 on the multiannual Union programme; and Article 2, Article 4 paragraph 1 and Article 8 of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is applicable to the Annual Report. |
| Member State should provide by Region/RFMO/RFO/IO:  **Region “North Atlantic” - RFMO/RFO/IO “ICES”:**  **1. Evidence of data quality assurance**  Information coming from Table 5A is available.  **2. Deviations from the Work Plan**  i. Summary of cases where the achieved number of sampled individuals was below the minimum planned number of sampled individuals:  i.a) Mainland - For some species (*Argyrosomus regius, Dicologlossa cuneata, Merluccius merluccius, Nephrops norvegicus*, *Octopus vulgaris*, *Scomber colias*, *Scomber scombrus*, *Solea solea, “*Sparidae. *Boops boops*”, “Sparidae. *Diplodus sargus*”, “Sparidae. *Diplodus vulgaris*”, “Sparidae. *Pagellus acarne*”) and variables, the number of individuals sampled at market was below planned because sampling is concurrent and the number of individuals available for sampling depends on landings (at-market) / catch (at-sea).  i.b) Mainland - For some species (*Merluccius merluccius, Nephrops norvegicus*, *Octopus vulgaris*, *Scomber colias*, *Scomber scombrus*, *Solea solea, “*Sparidae. *Boops boops*”, “Sparidae. *Diplodus sargus*”, “Sparidae. *Diplodus vulgaris*”, “Sparidae. *Pagellus acarne*”) and variables, market sampling could not be done in part of the year which limited the sampling of biological variables, mostly due to logistical issues especially concerning the travel of scientific observers to the main ports with landings of this species.  i.c) Mainland - For some species (*Loligo vulgaris, Merluccius merluccius, Octopus vulgaris, Trachurus trachurus*), commercial samples could not be obtained in part of the year, which limited the sampling of biological variables. This limitation was mostly due to logistical issues especially concerning the travel of scientific observers to the main ports with landings of this species.  i.d) Mainland - For some species *(Merluccius merluccius, Nephrops norvegicus*, *Octopus vulgaris*, *Scomber colias*, *Scomber scombrus*, *Solea solea, “*Sparidae. *Boops boops*”, “Sparidae. *Diplodus sargus*”, “Sparidae. *Diplodus vulgaris*”, “Sparidae, *Pagellus acarne*”, *Trachurus trachurus*), onboard sampling could not be done, which limited the sampling of biological variables, as onboard sampling in ICES IXa was suspended due to the COVID19 pandemic.  i.e) Mainland and Azores - For *Trachurus picturatus*, commercial samples in Azores could not be obtained due to a combination of factors: the laboratory on the island of S. Miguel was assigned to carry out the COVID tests, reduction of staff technicians and scarce landings at the port with laboratory, and terrible weather conditions that occurred in the Azores region also led to a decrease in the number of individuals available for sampling. In Mainland, commercial samples could not be obtained in part of the year which limited the sampling of biological variables. This limitation was mostly due to logistical issues especially concerning the travel of scientific observers to the main ports with landings of this species.  i.f) Azores - For some species (*Beryx splendens*, *Beryx decadactylus*, *Conger conger*, *Helicolenus dactylopterus*, *Pagellus bogaraveo*, *Phycis blennoides*, *Phycis phycis*), commercial samples could not be obtained due to a combination of factors: the laboratory on the island of S. Miguel was assigned to carry out the COVID tests, reduction of staff technicians and scarce landings of certain species at the port with laboratory, local quota regulation managed by trimester often determined fisheries closure and terrible weather conditions that occurred in the Azores region also led to a decrease in the number of individuals available for sampling.  i.g) Azores - For some species (*Beryx splendens*, *Beryx decadactylus*, *Conger conger*, *Helicolenus dactylopterus*, *Pagellus bogaraveo*, *Phycis phycis*), discards samples could not be obtained due to heavy logistic on islands without laboratory support and where onboard sampling took place. Some of the samples collected by observers onboard could not be analysed in the laboratory because they got lost.  i.h) Azores – For some species (*Beryx splendens*, *Beryx decadactylus*, *Helicolenus dactylopterus*, *Pagellus bogaraveo*) and variables, survey samples could not be obtained because ARQDAÇO is steered to demersal and deep-sea fish species and not to specific target species. Ocorrence of lower abundance of these species in defined fishing locations. Only 47% of the hauls planned were carried out because crew of the "N/I Arquipélago" went on strike (Extended comments - Text box 1G). *Helicolenus dactylopterus* and *Pagellus bogaraveo* are two of the species most tagged during survey and, this is why a significant difference is verified between individuals measured and sampled for other biological variables (age, weight, sex ratio and maturity).  ii) Summary of cases where the number of achieved sampled individuals was above the minimum planned number of sampled individuals:  ii.a) Mainland - For some species (*Dicentrarchus labrax*, *Engraulis encrasicolus*, *Loligo vulgaris*, *Lophius budegassa*, *Merluccius merluccius*, *Micromesistius poutassou*, *Nephrops norvegicus*, *Parapenaeus longirostris*, *Phycis blennoides*, “Selachii, Rajidae. *Raja naevus*”, “Selachii, Rajidae. *Raja microocellata*”, “*Raja montagui*”, “Selachii, Rajidae. *Raja brachyura*”, “*Raja clavata*”, *Sardina pilchardus*, *Scomber colias*, *Scomber scombrus*, *Solea solea*, Sparidae. *Boops boops*, Sparidae. *Diplodus sargus*, Sparidae. *Pagellus acarne*, Sparidae. *Sparus aurata*, *Trisopterus luscus*) and biological variables, the minimum number of individuals to be sampled was exceeded since individuals were sampled during concurrent market sampling and/or during survey, representing no additional expenditure.  ii.b) Mainland - For some species (*Engraulis encrasicolus*, *Micromesistius poutassou*, “Selachii, Rajidae. *Raja naevus”*, *Scomber colias*), the minimum number of individuals to be sampled in commercial samples was exceeded to increase the effective sample size to provide data to ICES Working Group, and/or improve knowledge on species biological parameters.  ii.c) Mainland - For some species (*Scomber colias*, *Trisopterus* spp. which refers to *Trisopterus luscus*) and variables, the minimum number of individuals to be sampled in commercial samples was exceeded since the sampling protocol defines a maximum number of individuals per area/length class/sex.  ii.d) Mainland and Azores - For some species (*Helicolenus dactylopterus*, *Phycis phycis*, *Trachurus picturatus*) and biological variables, the minimum number of individuals to be sampled was exceeded since individuals were sampled during concurrent market sampling, at-sea (extra onboard trips of vessels using LHP\_FIF and PS\_SPF were sampled so that observers would not be in breach of signed contracts) and/or during survey, representing no additional expenditure.  ii.e) Mainland and Azores - For *Trachurus picturatus* and biological variable Length, the minimum number of individuals to be sampled in commercial samples was exceeded since the planned number of individuals was incorrect in the Work Plan and increased sample size was needed to allow for planned sampled size in other variables that are stratified by this variable. Also, age determination is starting in Mainland, therefore all individuals sampled for other biological variables were also sampled for Length. No additional expenditure.  ii.f) Azores - For some species (*Beryx decadactylus*, *Beryx splendens*), biological variable Length from onboard samples was exceeded since extra onboard trips of vessels using LHP\_FIF were sampled so that observers would not be in breach of signed contracts, representing no additional expenditure.  ii.g) Azores - For *Phycis phycis*, apart from Length, sampling of biological variables was exceeded since individals were sampled during survey, representing no additional expenditure.  **3. Actions to avoid deviations**  i.a) Mainland - In what concerns market sampling, no action needed. In parallel with the data collection at-market by scientific observers, in 2019-2020 a pilot experiment was implemented in 3 Portuguese auctions of 27.9.a (Aveiro, Sesimbra, Portimão) using FishMetrics system of automatic/remote image acquisition of landing boxes during sales; and in 2022-2024 a new pilot experiment will be implemented in Aveiro using the same system but aiming at further advancing the system especially by developing automated species identification and individual measurements through artificial intelligence.  i.b) Mainland - This issue continues to receive attention in 2022 and efforts are being made to ensure the travel of scientific observers to fishing ports for at-market sampling activities.  i.c) Mainland - In what concerns commercial samples, this issue continues to receive attention in 2022 and efforts are being made to ensure the travel of scientific observers to fishing ports for at-market sampling activities.  i.d) Mainland - In what concerns onboard sampling, deviations due to COVID-19 pandemic are not expected to continue to occur in 2022.  i.e) Mainland and Azores – In Azores, the island of São Miguel still lacks laboratory infrastructure, but efforts have been made to overcome this situation. It is expected that a solution will be found in the second semester of 2022. A new technician is already assigned to the staff. Additionally, two vessels operating from the port with laboratory started to use PS\_SPF and it is expected an increase in the number of individuals available for sampling. In Mainland, this issue continues to receive attention in 2022 and efforts are being made to ensure the travel of scientific observers to fishing ports for at-market sampling activities.  i.f) Azores - The island of São Miguel still lacks laboratory infrastructure, but efforts have been made to overcome this situation. It is expected that a solution will be found in the second semester of 2022. A new technician is already assigned to the staff.  i.g) Azores - Due to difficulties observed, samples of species from discards samples will be obtained through opportunistic sampling in WP2022-2024 and a more strict sampling protocol will be implemented to avoid loss of samples by crew members. The island of São Miguel still lacks laboratory infrastructure, but efforts have been made to determine this situation. It is expected that a solution will be found in the second semester of 2022.  i.h) Azores - All efforts are being made to solve the strike situation and the 2022 survey is expected to occur.  ii.a), ii.b), ii.c), ii.d), and ii,e) The minimum planned number of individuals to be sampled will be reevaluated and adjusted if needed. It is expected that the outcome of the ICES WKBIOPTIM in which we are involved will provide guidance on the optimization of sampling effort and intensity.  ii.d) and ii.f) No action planned.  **Region “North Sea and Eastern Arctic” - RFMO/RFO/IO “ICES”:**  **1. Evidence of data quality assurance**  Information coming from Table 5A is available.  **2. Deviations from the Work Plan**  At-sea sampling only.  For *Sebastes mentella* and biological variables Length, Sex ratio, Age, the achieved number of sampled individuals was below the minimum planned number of sampled individuals since sampling depends on landings (at-market)/catch (at-sea).  For *Sebastes mentella* and biological variable Weight, the minimum planned number of sampled individuals was exceeded because sampling was carried out by an observer already onboard and additional samples can be made on a sampling day, with no additional expenditure.  **3. Actions to avoid deviations**  No additional expenditure. No action planned.  **Region “Other regions” - RFMO/RFO/IO “NA”:**  **1. Evidence of data quality assurance**  Information coming from Table 5A is available.  **2. Deviations from the Work Plan**  i) Summary of cases where the achieved number of sampled individuals was below the minimum planned number of sampled individuals:  i.a) In Madeira, commercial sampling for biological variables of *Scomber colias* and *Trachurus* spp. was limited during the first quarter of 2021 due to the COVID-19 pandemic. In addition, the acquisition of samples was not possible due to failure on the purchase procedure. Finally, the sharp reduction in landings of *Scomber colias* (57%) and *Trachurus* spp. (52%) in relation to the reference years further contributed to the reduced number of individuals sampled.  i.b) In Madeira, for limpets (Patellidae), commercial samples for some biological variables could not be obtained in full due to the reduction of 15% in landings when compared to the reference years and also because the harvesting season ended two months earlier than expected. Additionally, there were difficulties in providing a vehicle for the technicians to travel to the auction houses far from Funchal were the majority of the landings of these species occurs.  i.c) Azores - For some species (*Scomber colias*, *Sparisoma cretense*), commercial samples could not be obtained due to a combination of factors that contributed to a reduced number of individuals available for sampling: the laboratory on the island of S. Miguel was assigned to carry out the COVID tests, reduction of staff technicians and scarce landings of these species at the port with laboratory, local quota regulation managed by trimester often determined fisheries closure and terrible weather conditions that occurred in the Azores region.  i.d) Azores - sampling for length of *Patellidae* could not be obtained for market sampling due to main sampling intensity assigned to a port (Flores) that never had a sampler technician before and, for this reason, refusal rates were observed.  ii) Summary of cases where the number of achieved sampled individuals was above the minimum planned number of sampled individuals:  ii.a) Azores and Madeira – sampling for length of *Scomber colias* was exceeded since individuals were sampled during concurrent market sampling and through the FishMetrics system of automatic/remote image acquisition of landing boxes during sales, representing no additional expenditure.  ii.b) Madeira - sampling for length of *Trachurus* spp. was exceeded since individuals were sampled through the FishMetrics representing no additional costs.  **3. Actions to avoid deviations**  i.a) In Madeira, efforts are in place to avoid failures in purchase commercial samples during 2022.  In Madeira, to fill the sampling gap for biological variables a remote measurement digital system (FishMetrics) was implemented in all auction houses in 2021. This measure will allow to significantly increase the number of market samples for biological variables. Farther, significant efforts are in place to assure the acquisition of information through surveys at ports, as to mitigate the lack of information collected.  i.b) In Madeira, efforts are in place to solve the transport of technicians to ports far from Funchal, and it is expected to resume normality in the second semester of 2022.  i.c) In the Azores, the island of São Miguel still lacks laboratory infrastructure, but efforts have been made to overcome this situation. It is expected that a solution will be found in the second semester of 2022. A new technician is already assigned to the staff.  i.d) Also in the Azores, it is foreseen in WP2022-24 the continued presence of sampler in the port in question (Flores), which will certainly improve the approach to sampling. Sampling for limpets is also foreseen to occur in more landing ports in WP2022-24.  **Region “Other regions” - RFMO/RFO/IO “ICCAT”:**  **1. Evidence of data quality assurance**  Information coming from Table 5A is available.  **2. Deviations from the Work Plan**  i) Summary of cases where the achieved number of sampled individuals was below the minimum planned number of sampled individuals:  i.a) For some species (*Katsuwonus pelamis*, *Sarda sarda*) and biological variables, the purchase of commercial samples was limited by a combination of factors: Azores - low landings in 2021 of *Sarda sarda;* the *Katsuwonus pelamis* landings occur in bulk directly into vehicles for transport into the can industry, the laboratory on the island of S. Miguel was assigned to carry out the COVID tests, reduction of staff technicians and scarce landings of both species at the port with laboratory, and terrible weather conditions that occurred in the Azores region also led to a decrease in the number of individuals available for sampling; Madeira – samples could not be obtained in part of the year due to the COVID-19 pandemic and reduction of landings in relation to reference years (71% regarding *Katsuwonus pelamis*) further contributed for the reduced number of individuals sampled achieved.  i.b) For some species (*Auxis rochei, Istiophorus albicans, Makaira nigricans,* *Sarda sarda)* and biological variables, the number of individuals sampled at market and/or onboard was below planned because sampling is concurrent and the number of individuals available for sampling depends on landings (at-market) / catch (at-sea). There was reduction of 38% in the landings of *Sarda sarda* in 2021, in relation to reference years. It should be noted that some of these are bycatch species.  i.c) For *Thunnus albacares* and biological variables length and weight, the number of individuals sampled from all data sources was below planned because landings of this species are usually very scarce if compared to other tuna species throughout the years, which increases the complexity in defining the planned number of individuals to be sampled. Sampling is concurrent and depends on landings (at-market)/catch (at-sea). In Madeira, samples could not be obtained in part of the year due to the COVID-19 pandemic and it was observed a reduction of 95% in landings in relation to reference years.  i.d) For *Xiphias gladius* and biological variable length, the number of individuals from onboard, self-sampling and market samples was below planned because sampling is concurrent and depends on landings (at-market)/catch (at-sea). In Azores, landings often occur directly into refrigerator containers with no access to individuals for sampling. Majority of length sampling obtained in the Azores (96%) is from the onboard observer project COSTA (Consolidating Sea Turtle Conservation in the Azores) funded by the Marine Turtle Conservation Fund of the US Fish and Wildlife Service and the Archie Carr Center for Sea Turtle Research.  i.e) For some species (*Prionace glauca, Thunnus alalunga, Thunnus obesus*) and the biological variable weight, the number of individuals sampled at market was below planned because of the operational limitation of the scientific observers in sampling heavy individuals or of the impossibility to directly determine the variable in the data collected with the Fishmetrics system when several individuals are landed in one box. In Madeira, samples could not be obtained in part of the year due to the COVID-19 pandemic.  1.f) For *Thunnus thynnus* and the biological variable sex ratio, the number of individuals sampled onboard was below planned because of the operational limitation of the scientific observers in sampling this variable, since it depends on the possibility of the observer having access to the individuals during gutting.  ii) Summary of cases where the number of achieved sampled individuals was above the minimum planned number of sampled individuals:  ii.a) For some species (*Prionace glauca*, *Thunnus alalunga, Xiphias gladius*) and biological variables, the minimum number of individuals to be sampled was exceeded since individuals were sampled during concurrent market sampling and/or onboard sampling, representing no additional expenditure. In Azores, trips planned for 2020 from at-sea sampling of vessels using LLD\_LPF were carried over to 2021 without additional costs (more explanations in Text Box 1F and 4A). In adition, *Prionace glauca* and *Xipias gladius* sampling includes individuals from the onboard observer project COSTA (Consolidating Sea Turtle Conservation in the Azores) funded by the Marine Turtle Conservation Fund of the US Fish and Wildlife Service and the Archie Carr Center for Sea Turtle Research.  **3. Actions to avoid deviations**  i.a) Azores - Contacts with the industry will be made in order to facilitate sampling in the factory infrastructure. The island of São Miguel still lacks laboratory infrastructure, but efforts have been made to resolve this situation and it is expected that a solution will be found in the second semester of 2022. A new technician has already been assigned to the staff.  i.b), i.c), i.d), i.e), i.f) These issues continue to receive attention in 2022. No action planned.  i.a), i.c), and i.e) Deviations in sampling due to the COVID-19 pandemic in Madeira are not expected to continue to occur in 2022.  i.b), i.d) Due to difficulties observed, *Sarda sarda* and *Xiphias gladius* will be sampled through opportunistic sampling in WP 2022-2024.  ii.a) This issue continues to receive attention in 2022. No action needed.  **Region “Other regions” - RFMO/RFO/IO “IOTC”:**  **1. Evidence of data quality assurance**  Information coming from Table 5A is available.  **2. Deviations from the Work Plan**  At-sea sampling only.  No sampling in 2021. Onboard sampling in IOTC could not be done due to the COVID19 pandemic.  **3. Actions to avoid deviations**  At-sea sampling only.  Deviations in at-sea sampling due to COVID-19 pandemic are not expected to continue to occur in 2022. Additional measures are being taken to increase safety of scientific observers and vessel crew.  **Region “Other regions” - RFMO/RFO/IO “NAFO”:**  **1. Evidence of data quality assurance**  Information coming from Table 5A is available.  **2. Deviations from the Work Plan**  At-sea sampling only.  For some species (*Gadus morhua*, *Hippoglossoides platessoides*, *Limanda ferruginea*, *Reinhardtius hippoglossoides*), Area/Stock and biological variables, the achieved number of sampled individuals was below the minimum planned number of sampled individuals since sampling depends on landings (at-market)/catch (at-sea). It is noted that some of these have no quota and no TAC, or very small quota.  For some species (*Amblyraja radiata*, *Gadus morhua*, *Reinhardtius hippoglossoides*, *Sebastes* spp.), Area/Stock and biological variables the minimum planned number of sampled individuals was exceeded because sampling was carried out by an observer already onboard and additional samples can be made on a sampling day, with no additional expenditure.  **3. Actions to avoid deviations**  No additional expenditure. No action planned. |

Section 1: Biological Data

Text Box 1D - Recreational fisheries

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| General comment: This box fulfills paragraph 2 point (a) (iv) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 3 and Article 4 paragraph 1 of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is applicable to the Annual Report. This box is intended to provide information on the design, implementation and analysis of all components of sampling schemes/ surveys that are listed in Table 1D. |
| Supposedly, a 2nd phase of the pilot studies (PS1.1 - Relative share of catches of sea bass recreational fisheries compared to commercial fisheries in Mainland and PS1.2 - Relative share of catches of recreational fisheries compared to commercial fisheries in Mainland:Pollack, elasmobranchs, highly migratory species, and eel) would be under development, which would make it possible to incorporate the results into routine sampling by the PRT. However, due to the pandemic, this phase did not take place, as it was constantly postponed. Recreational fishing activity was prohibited throughout 2020 and until April 2021. At this time when PRT could have started the study and created the fishermen's reference panel, it was considered not to do so, considering that outside the scope of the DCF, a process of monitoring recreational fishing was underway in sensitive areas of the Mainland. The project aims to assess the impact that recreational fishing has on the most sensitive areas of the Portuguese mainland coast and monitor the intensity and income of recreational fishing within safe biological limits, as well as assessing its socio-economic relevance for the populations in question, seeking to define monitoring programs for this activity to be implemented in the future. This project will be completed by the end of 2022, the date from which the DGRM will be able to use the data to process them within the scope of the DCF.  Following principle 9 of the code of conduct for European statistics: Non-excessive burden on respondents, Portugal decided to wait for the results of the referred project to design a sampling regime.  Although this decision creates a delay in the commitments assumed by Portugal in the work plans, it is the most efficient in the use of resources.  For the reasons described above and about the pilot studies mentioned, there is no information to give for points 1, 2, 3 and 4 of this text box, concerning mainland recreational fisheries.  The Azorean systematic data collection is based on the results of Pilot Study 1.3 (under EU-MAP 2017-2019: Relative share of catches of elasmobranchs and highly migratory species recreational fisheries compared to commercial fisheries in Azores (ICES area X)) and present two surveys (Unique Survey ID: Elasmobranchs\_Azores\_off-site surveys and HighlyMigratorySpp\_Azores\_off-site surveys) that are both based on off-site surveys composed by three main elements: i) web-based logbook (including APP and monthly phone logbook for low computer skills persons); ii) survey embedded in the recreational fishing license system; and iii) phone and logbooks survey for recreational charter boats (touristic fishing).  1. Description of the target population  The target population is all licensed resident recreational fishers (boat anglers and spearfishers) and all licensed touristic fishing companies (charter boats). In the case of boat anglers and spearfishers before issuing the license a survey is carried out. Moreover, all licensed touristic fishing companies need to record catch and effort data on an on-line (or APP) logbook as mandatory. The shore angling and hand collecting sectors were not covered once they did not catch the target species. For this reason, these two sectors are outside the scope of the survey.  2. Type of survey  Yes, the surveys are identified correctly in table 5A.  3. Data Quality  Yes, information about non-responses and refusals is found in the Annual Report, Table 5A. No information to add for Elasmobranchs\_Azores\_off-site surveys and HighlyMigratorySpp\_Azores\_off-site surveys.  4. Data Analysis and processing  The number of fishers for spearfishing and angling boats was assumed by the licenses, since the number of non-licenses fishers are low (< 1.5%). The avidity given by the license system survey have problems of recall bias and, for that reason, the fishing trips and catches were imputed from the panel (logbook). Only fully responding logbooks (panel) participants were accounted for the analysis (Removal of respondents who provided < 12 months of data). Because the number of high avid fishers was low, four stated avidity groups were established for spearfishing and boats (0; 1 – 10; 11 – 20; > 21 trips). The catch estimation process including the precision of estimates was based on van der Hammen et al. (2016).  Documentation on processes of imputation methods and accuracy on data processing evaluation is still being prepared and will be available during 2023.  Reference:  van der Hammen, T., de Graaf, M., & Lyle, J. M. (2016). Estimating catches of marine and freshwater recreational fisheries in the Netherlands using an online panel survey. ICES Journal of Marine Science, 73(2), 441-450.  (max. 900 words per survey) |

Section 1: Biological Data

Pilot Study 1.1 (PS1.1): Relative share of catches of sea bass recreational fisheries compared to commercial fisheries in Mainland

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| General comment: This box fulfils paragraph 4 of Chapter II of the Annex of the Implementing Decision (EU) 2019/909 on the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (a) of the Implementing Decision (EU) 2016/1701 on the format of the WP. |
| General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study. |
| **1.**    Aim of pilot study:  As the activity of recreational fishing in Portugal was insufficiently monitored, a pilot study was developed in 2017-2018 by an external entity ordered by the General Directorate of Natural Resources, Safety and Maritime Services (DGRM) and coordinated by the Center for Marine Sciences of the University of Algarve (CCMAR).  The aim was to fill the gaps with regard to the systematic collection of data on the recreational catches of the species included in the DCF. In order to attain the identified objectives, a comprehensive sampling strategy was defined.  In terms of the estimates by DCF species, for sea bass, the total annual catch for shore angling and boat-based angling catches was estimated at 965 ton, and the total annual harvest (i.e., retained fish) at 949 ton.  The comparison between annual estimated recreational harvest and commercial catches indicates that the recreational fisheries (shore based and boat-based angling) of sea bass and spotted sea bass represent 68% of the total annual landings for these two species.  In general, this pilot study demonstrates the importance that sea bass recreational fishing has on the Portuguese fisheries. However, despite the size and nature of the pilot project, it should be noted that there are various constraints that may affect the estimates, namely because this was a study of only one fishing year.  Therefore, before the definition of regular sampling a second phase of the pilot study will be  developed.  **2.**    Duration of pilot study:  It is expected that the new phase of the  pilot study will be developed in 2020 and 2021.  **3.**    Methodology and expected outcomes of pilot study:  Recreational fishing in Portugal includes three segments, onshore fishing (“pesca apeada”), boat fishing and spearfishing. In mainland the highest number of licenses is from onshore fishing. In 2018, 187.372 licenses were issued for onshore fishing followed followed by boat fishing with 68.296 licenses. The number of licenses may not match with the number of recreational fishermen who exercised this activity as a significant number of licenses are granted for periods less than one year and, each year, a fisherman may acquire several licenses.  3.1. Population  The population is all recreational fishermen in a given year or period, who carry out their activity in the Portuguese coast, integrating the three segments: onshore fishing; boat fishing and spearfishing. The universe of the population corresponds to the total number of licenses allocated to these three groups.  3.2. Sampling  Sampling is expected to include the following components:  • Surveys by questionnaire on a fixed panel of recreational fishers recruited through DGRM web page;  • Surveys in fishing competitions (sport fishing).  3.3 Data collection  Data collection will be focused on estimation of fishing effort and catches.  Databases will be organized with all the collected information.  (max 900 words) |
| As explained in text box 1D, due to the pandemic, this phase of Pilot study did not take place, as it was constantly postponed. PRT has nothing to comment on points 4 and 5.  4. Achievement of the original expected outcomes of pilot study and justification if this was not the case.  NA  5. Incorporation of results from pilot study into regular sampling by the Member State.  NA |

Pilot Study 1.2 (PS1.2): Relative share of catches of recreational fisheries compared to commercial fisheries in Mainland:Pollack, elasmobranchs, highly migratory species and eel

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| General comment: This box fulfils paragraph 4 of Chapter II of the Annex of the Implementing Decision (EU) 2019/909 on the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (a) of the Implementing Decision (EU) 2016/1701 on the format of the WP. |
| General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study. |
| **1.**     Aim of pilot study:  As the activity of recreational fishing in Portugal was insufficiently monitored, a pilot study was developed in 2017-2018 by an external entity ordered by the General Directorate of Natural Resources, Safety and Maritime Services (DGRM) and coordinated by the Center for Marine Sciences of the University of Algarve (CCMAR) This pilot study aimed to estimate the total catch of the pollack, elasmobranchs, highly migratory species and eel caught by recreational fishing in Portugal-mainland.  Concerning pollack, elasmobranchs, highly migratory species, the sampling area considered the entire Portuguese continental coast, divided into NUTS II and subsequently sub-divided into sections of 5 km of coastline (for shore angling and spearfishing) or access points (for onboard angling and spearfishing). Apart from the official data on recreational fisheries licenses (DGRM), the project developed a data collection strategy using face-to-face questionnaire surveys, historical sport fishing activity data from anglers’ federations and associations and monitoring of fishing tournaments.  Concerning eel, recreational fishing is forbidden in areas under maritime jurisdiction (Portaria nº 14/2014, of 23 January). In 2017, legislation was published with a ban of recreational fishing in fresh waters (Portaria 360/2017, of 22 November). Therefore, there will be no sampling plan for eel recreational fishery.  Of all the species under the DCF, no catches of pollack (*Pollachius pollachius*) were registered. Blue shark (*Prionace glauca*) was caught in the spring (one single individual, which was not targeted), and in the summer (eight specimens). Only four white marlins and two skipjack tuna were also caught and in the summer.  In terms of the estimates by DCF species, for blue shark, white marlin and skipjack tunas, and because of the small number of specimens, they did not represent robust estimates.  Therefore, before deciding on the need of regular sampling, a second phase of the pilot study will be developed.  **2.**     Duration of pilot study:  It is expected that the new phase of the  pilot study will be developed in 2020 and 2021.  **3.**     Methodology and expected outcomes of pilot study:  • Surveys by questionnaire on a fixed panel of recreational fishers recruited through DGRM web page;  • Surveys in fishing competitions (sport fishing).  3.1. Population  The population is all recreational fishermen in a given year or period, who carry out their activity in the Portuguese coast, integrating the three segments: onshore fishing; boat fishing and spearfishing. The universe of the population corresponds to the total number of licenses allocated to these three groups.  3.2. Sampling  Sampling is expected to include the following components:  • Surveys by questionnaire on a fixed panel of recreational fishers recruited through DGRM web page;  • Surveys in fishing competitions (sport fishing).  3.3 Data collection  Data collection will be focused on estimation of fishing effort and catches.  Databases will be organized with all the collected information.  (max 900 words) |
| As explained in text box 1D, due to the pandemic, this phase of Pilot study did not take place, as it was constantly postponed. PRT has nothing to comment on points 4 and 5.  4. Achievement of the original expected outcomes of pilot study and justification if this was not the case.  NA  5. Incorporation of results from pilot study into regular sampling by the Member State.  NA |

Pilot Study 1.3 (PS1.3): Relative share of catches of elasmobranchs and highly migratory species recreational fisheries compared to commercial fisheries in Azores (ICES area X)

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| General comment: This box fulfils paragraph 4 of Chapter II of the Annex of the Implementing Decision (EU) 2019/909 on the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (a) of the Implementing Decision (EU) 2016/1701 on the format of the WP. |
| General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study. |
| 1. Aim of pilot study   This pilot survey aims to estimate the total catch of elasmobranchs and highly migratory ICCAT  species by recreational fishing in Azores.   1. Duration of pilot study   The pilot survey design includes a foreseen activity calendar of 24 months for the off-site components and 14 months for the on-site component (between May of 2020 and June of 2021).   1. Methodology and expected outcomes of pilot study   Recreational fishing in Azores captured a high diversity of species including elasmobranchs, tuna species and some vulnerable marine species. The most important fishing modes are spearfishing and boat fishing, estimated to catch 202 tons and 148 tons, respectively. In particular, for some relevant species as Parrot fish (*Sparisoma cretense*) with 112 tons (40% of artisanal landings) or Blacktail comber (*Serranus atricauda*) with 77 tons (124% of artisanal landings), there is evidence of management policy needs.  Despite the results obtained during NWP 2017-2019, additional methods will be applied in order to improve the estimates and knowledge of recreational fisheries in the region. (before the decision to implement a sampling plan.) Therefore, an adjustment to the pilot study using complementary methodologies is necessary.  The extension of the pilot survey for 2020-2021 will focus on the recreational boat fishing and spearfishing. The methodology will be based on a complemented survey design by applying an off-site survey composed by three main elements: i) a survey embedded in the recreational fishing license system; ii) a web based logbook; and iii) logbooks survey for recreational charter boats and an on-site survey (access point survey).  The first off-site survey component is embedded in the recreational fishing license system. This 12-month recall survey will take place at the time the recreational boat angler or spearfisher is applying for a recreational fishing license in an informatics platform that allows the data collection on fishing effort, mean catch per trip and main captured species. This survey implemented during the work plan 20117-2019 will continue during the WP 2020-2021, but with adjustments to improve the engagement rate and the data quality.  The second off-site survey component is a 12-month logbook. This survey implemented during the WP  2017-2019, presented a weak engagement from the recreational fishers. To increase this rate, the recreational fishing license system platform will be used as a get way to recruit a panel for filling up the logbook. It consists of a web logbook that allows collecting data on fishing effort, catch, discards and economic expenditures.  The third off-site survey component it's headed for recreational boat charters for big game fishing and bottom fishing. During 2017–2019, the catch and effort data have been collected by phone surveys revealing that this fleet is mainly based on catch and release handling practice (i.e., 16.7 tons of highly migratory pelagic fishes in 2018). For the WP 2020-2021, web based logbooks will be implemented and enterprises will be contacted monthly to confirm that they are reporting the data (retained and catch and released per fishing trip).  The on-site survey component aims to estimate catch composition, catch rate and other issues (e.g., fishing effort, economic expenditures, and unlicensed fishers) on an island- or archipelago-wide scale. Bearing in mind that sampling the nine Azores islands would be very expensive, five islands were selected based on: i) the number of recreational fishing licenses per island, ii) the island dimension (spatial and population), iii) geographic sampling distribution (three islands groups; western, central and eastern), and iv) islands already surveyed, allowing also an analyses of temporal changes. The islands selected are Flores, Pico, Faial, Terceira, and São Miguel Islands. During the first period (2 month), the work will concentrate on field tests, recognition of the coastal areas, and test interviews with possible methodological adjustments. The second period (12 month) aims to apply the methodology designed. The sampling strategy design is the on-site access point-survey (complete trips) (Pollock et al., 1994). The study islands will be sampled quarterly with a two-stage probability sampling (Pollock et al., 1994): eight days of sampling with exception of Flores island (four days of sampling) due to the fewer population and lower licenses boats. The islands sampling scheme will be randomly schedule in week and weekend days. Two access point combinations per each day will be selected (one in the morning and other in afternoon). The sampling units will be chosen with non-uniform probability for islands where some access points have higher importance for boat fishing (e.g., due to the presence of an important marina). While in islands with multiple site ramps and without an access point weighting more importance, a uniform probability is applied. The sampling scheme will have some adjustments accordingly to weather prevision (i.e., avoiding storms with few or none fishing effort; Diogo and Pereira, 2013).  Diogo, H.M.C. and Pereira, J.G. 2013. Impact evaluation of spear fishing on fish communities in an urban area of São Miguel Island (Azores Archipelago). *Fisheries Management and Ecology*, *20*(6), pp.473-483.  Pollock, K. H., Jones, C. M., and Brown T. L. 1994. Angler survey methods and their applications in fisheries management. American Fisheries Society, Special Publication 25, Bethesda, Maryland.  (max 900 words) |
| Brief description of the results obtained (including deviations from planned and justifications as to why if this was not the case).  4. Achievement of the original expected outcomes of pilot study and justification if this was not the case.  The Pilot Study 1.3 (PS1.3): Relative share of catches of elasmobranchs and highly migratory species recreational fisheries compared to commercial fisheries in Azores (ICES area X) was canceled due to Covid-19 pandemic situation.  5. Incorporation of results from pilot study into regular sampling by the Member State.  As Pilot Study 1.3 (PS1.3 – WP2021) was canceled, the systematic data collection in the Azores (based on off-site surveys) was established by the results of Pilot Study 1.3 (WP2017-2019). |

Pilot Study 1.4 (PS1.4): Relative share of catches of highly migratory species recreational fisheries compared to commercial fisheries in Madeira (CECAF 34.1.2)

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| General comment: This box fulfils paragraph 4 of Chapter II of the Annex of the Implementing Decision (EU) 2019/909 on the multiannual Union programme and Article 2 and Article 4 paragraph (3) point (a) of the Implementing Decision (EU) 2016/1701 on the format of the WP. |
| General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study. |
| ***Follow-Up study* on the highly migratory species recreational fisheries in Madeira (CECAF 34.1.2)**   1. Aim of pilot study   Following a pilot study - *conducted to analyze catches of species obtained in recreational fishing and to assess the impact compared to commercial fishing, in order to determine the social and economic importance of this activity and define the rules that help maintaining a sustainable fishery* - further studies are now ongoing and will be continued, taking in account the analysis of the results already obtained and its validation, and aiming to enhance the overall knowledge about recreational fisheries in Madeira, its catches composition and abundance, improve the monitoring of the fishery and collection of biological data and assess the impact of this fishery in the resources.  In Madeira, the big game fishing fleet has increased during the last decade, possibly due to the increase in tourism. In this study 31 vessels were registered, an increase of 101% compared with the number of vessels known to exist in 2003.  Blue marlin, Makaira nigricans (Lacepède, 1802) is the target species and the most frequently captured, although other large pelagic fishes, such as the Atlantic white marlin, Kajikia albida (Poey, 1860) and occasionally other species of spearfish. By catch species, e.g. wahoos, Acanthocybium solandri (Cuvier, 1832), dolphin fishes, Coryphaena hippurus (Linnaeus, 1758) and C. equiselis (Linnaeus, 1758), and various species of tuna: bigeye tuna, Thunnus obesus (Lowe, 1839); albacore, Thunnus alalunga (Bonnaterre, 1788) or skipjack, Katsuwonus pelamis (Linnaeus, 1758) can be caught but its frequency its most variable yearly.  The average weight of blue marlin in Madeira (295.5 kg) is higher than in other regions of this area of the Eastern Atlantic and of the world, being Madeira considered as one of the best places to capture larger specimens (499 kg was the weight of the biggest blue marlin caught in the period analyzed). Anglers in general, follow catch & release technique. This practice and the limited number of other species captured, suggest that this type of fishery most probably does not significantly affect these resources. However, the economic impact of the big game fishing activity in Madeira is estimated around 2 million euros per year (representing 16% of the total value of the commercial fishing of large migratory pelagic species), an amount of money that should be considered when analyzing the impact of this activity in the regional GDP and its importance to the tourism sector. This study should also be relevant to give guidance to further monitoring of this fishery activity and the assessment of its environmental and socio-economic impacts.   1. Duration of pilot study   From 1st January 2020 until 31th December 2021.   1. Methodology and expected outcomes of pilot study   The Madeira management of the exercise of recreational fishing on board already requires the licensing by boat, registered in the recreational or Maritime-Tourism activity.  Licensing is carried out at the Regional Fisheries Directorate or via the Government services, “SIMPLIFY”. Under current legislation, the holding of any sport fishing competition requires the permission of the Regional Fisheries Directorate.  The effective implementation for monitoring Madeira recreational fisheries is preceded by a preparatory phase comprising the enforcement of the Autonomous Region of Madeira legislation relative to the subject of the ludic fisheries. It commits to the Regional Directorate of Fisheries the implementation of the monitoring activity, ensuring the registration of recreational fishing activities and determining a mandatory response, of all licensed or authorized to exercise recreational fishing, to the surveys that will be carried out to monitor the activity and determine the catches. The renewal of their license is dependent on the accurate and complete response to these inquiries. The enforcement of existent legal tools comprises a deadline of ten days for the delivery of the inquires after each recreational fishing activity (number 3, of the article 14, of the Ordinance n. º 484/2016, of 14th November).  As of now, inquiries are already being furnished to all licensed practitioners and mandatory responses will allow a comprehensive knowledge about each fishing trip or activity, including the big game fishing segment. Several actions were made, and will continue, regarding the conduction of sessions of clarification of stakeholders about the objectives, context and correct way to answer the distributed surveys.  In a second phase, that starts 1ts January 2020 and cover the complete duration of this “*Follow-up study*”, the above-mentioned measures should be completed and information gathered in a database should lead to the accurate determination of fishing effort, composition of catches, catches per unit of effort end destination of catches. Information of length and weight of specimens caught will also be gathered. This information will be done by estimative, in the case of catch and release and by effective measurement in the case of specimens caught and landed in the fishing ports for commercial purpose in auctions or discard.  Measures to comply with RECOMMENDATION 18-05 (BIL) by ICCAT will be implemented, namely the objective of a 5% scientific observer coverage of blue marlin and white marlin/spearfish tournament landings.  A revision of the existent Madeira legislation pertaining to the regulation of recreational fishery, namely the adaptation of existent minimum size limits of catches of blue and with marlins and other relevant species to comply with the recommendations issued by ICCAT.  An online portal will be prepared to facilitate license, information, and reports of fishery and catches issues by licensed practitioners. This portal should be available by the end of 2020.  A detailed report of this study will be prepared in the last trimester of 2021, analyzed and made available by the end of the first quarter of 2022.  (max 900 words) |
| Brief description of the results obtained (including deviations from planned and justifications as to why if this was not the case).  The pilot study developed between 2017-2019, targeted the species captured by the BGF mainly the blue marlin (*Makaira nigricans*, Lacepède, 1802) and white marlin (*Kajikia albida* (Poey, 1860)). Tuna species like bigeye tuna (*Tunnus obesus* (Lowe, 1839)), albacore (*Thunnus alalunga*, (Bonnaterre, 1788)) and skipjack (*Katsuwonus pelamis* (Linnaeus, 1758)) were also considered, although they were less frequent.  Comparison between recreational and commercial fisheries showed that artisanal boats in 2017 landed 91 species in fishing ports, while recreational boat fishing catches landed 58 species. The most frequent catches were *Dentex gibbosus*, *Phycis phycis* and *Pagrus pagrus* for artisanal fishery and *P. pagrus*, *Serranus atricauda* and *Diplodus* spp. for recreational fishery. Comparing the similar fishing gears, artisanal fishery always showed higher catch per unit of effort rates than recreational boat fishery. Nevertheless, the low number of artisanal fishery boats in comparison with the recreational ones reflected the lower total landings of the artisanal fishery, which in 2017 were 62.3 t, compared with the 509.8 t estimated catches for the recreational fishery. Though the estimated recreational fishing data were based on surveys and thus subject to various biases, this activity seems to exert significant pressure on coastal marine target species.  In 2021, fishermen who obtained fishing licenses directly in DRM facilities, were invited to take voluntarily questionnaire (each with a recall survey, fishermen socioeconomic characterization and 10 diary /fishing events entries). Approximately 200 questionnaires were successfully delivered to fishermen. From these about 15% were retrieved back fully filled. Digital questionnaires were also created and delivered to all fishermen who confirmed their informatic skills in performing digitally their fill up. This mode was preferred by BGF maritime touristic companies.  Licensing trough the Regional Government electronic portal (i.e. SIMPLIFICA) is now fully operational and mandatory recall surveys (12 month recall survey) will be implemented for all recreational fishermen who choose to obtain license trough this mode, for all fishing modalities.  Although MRF of Madeira are already regulated by the Ordinance n. º 484/2016, of 14th November, DRM considered that enforcement of the existent legal tools (e.g. mandatory surveys) to Recreational Fisheries, should be a gradual process, with a preparatory phase before applying totally the legal tools. In this sense, during 2020 and 2021, DRM team started sensibilization actions, in order to improve: MRF legislation awareness; quality of data gathered trough the surveys and increase of participation rate. Clarification actions were also made opportunistically aiming at explaining to fishermen the importance of the surveys in order to manage sustainably the target species. Once clarification/sensibilization actions covers significantly stakeholders from all modalities, enforcement of the law, regarding mandatory monitoring surveys will be implemented.  4. Achievement of the original expected outcomes of pilot study and justification if this was not the case.  Taking into account the difficulties encountered due to Covid-19 pandemic and the low collaboration of the fishermen in providing the data trough questionnaires, web based tools, (online portal and mobile application) are being developed in order to improve acquisition of data, which is estimated to be available in 2022/2023.  Sensibilization actions started during 2021, but it did not covered significantly all fishermen/modalities, due to shortage of human resources. However due to our effort in promoting the cooperation relations during 2020 and 2021, we have successfully planned for 2022 two non-formal meetings with all BGF stakeholders.  5. Incorporation of results from pilot study into regular sampling by the Member State.  Results from pilot study stresses out the need of scientific surveys in all MRF modalities, as catches and CPUE estimations were significantly high, and for some species, higher when compared with artisanal fisheries.  The implementation of regular sampling of MRF is currently being analysed, namely, the methodology, which must be standardized and coherent with other Member States and Portuguese subdivisions, and allocation of human and financial resources, which have been the main constraint to accomplish the main objectives. |

Section 1: Biological Data

Text Box 1E: Anadromous and catadromous species data collection in fresh water

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| General comment: This box fulfills paragraph 2 points (b) and (c) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2 of the Implementing Decision (EU) 2016/1701 on the format of the WP. |
| General comment: This box is applicable to the Annual Report. |
| 1.Justification of data collection programme for the PT EMU  Stock assessment requires collection of stock indicators to accomplish the goals set by the Eel Regulation (mortality and biomass indicators). A combination of methods including the commercial fishery and independent surveys will be used as a proxy to estimate those indicators. The river basin chosen to represent the PT EMU is River Mondego (estuary and freshwater) to compare with data from the 1990’s but because this EMU is the whole country and the production of eels is affected by the type of aquatic system, a coastal lagoon (Santo André Lagoon) is also included in the data collection to represent the variety of aquatic systems (river + estuary + coastal lagoon). The fishery will be monitored (mortality) and a sample of eels will be collected (length, weight, sex, age).  It is prohibited to fish glass eels and silver eels in the PT EMU, which implies that commercial fisheries can only provide data for yellow eels between January and September, when the fishery is allowed. Data on recruitment, stock abundance and silver eel migration/production, have to be obtained from independent surveys. The methods used to collect that information will be electrofishing for freshwater and fyke nets for the estuary and coastal lagoon. To obtain data related to the fishery, questionnaires will be done to all fishermen licensed to fish in freshwater, and to all fishermen licensed to fish in brackish water. Besides, and to assess the pressure of the fishery, logbooks will be distributed monthly to some fishermen who volunteer to cooperate, and samples will be obtained from commercial fishery.  2.Justification of data collection programme for the Minho EMU  Glass eel: Glass eel fishing is allowed for professional fishermen between November and February (4 new moons). Concerning recruitment analysis, it is intended to perform experimental fishing using one stow net in estuary, in new moon, between November and May. Position, depth, water temperature, salinity, water velocity as well as biological parameters such as length, weight and pigmentation stage will be recorded from a glass eel sample. Logbooks will be analyzed to estimate CPUE and compare with experimental fishing.  Yellow/silver eels: Commercial and recreational fishing is not allowed in the River Minho. Concerning the analysis of stock abundance and sex ratio of emigrating eel, it is intended to perform electric fishing in tributaries covering the maximum area during three years and sampling in different stream order classification. Fishing area (m2), stream average width, average depth, position, temperature, oxygen, visual sediment characteristics, as well as biological parameters such as length, weight and ocular index (Pankhurst and/or Durif indices), will be recorded. A sample of 30 eels per year in migrant stage (silvering) with length less than 50 cm, will be used for sex ratio and age analysis. In River Minho, in different points of the estuary, 10 fyke-nets will be used during two nights with a monthly periodicity. For biological data acquisition the same procedures apply as described above.  (max 250 words per Area) |
| 2. Were the planned number achieved?  Minho EMU:  Details of deviations to the Work Plan are presented below:  Monthly experimental glass eel fishing with stow net was planned for Nov 2020-May 2021. The weather conditions (strong river flow) didn’t allow for sampling in February 2021.  Technical problems with the electric fishing equipment didn’t allow for sampling in all stations.  A sample of 31 eels was used for biological sampling (sex ratio and age analysis) and among these only a low number of individuals were silver eels.  PT EMU:  Details of deviations to the Work Plan are presented below:  Monthly experimental glass eel fishing with stow net was planned for Nov 2020-May 2021. Sampling could not be done in February 2021 due to the COVID-19 pandemic.  In the Mondego basin, the planned distribution of logbooks among fishers was not achieved due to the low relevance of the eel fishery (few fishers targeting the species, with very occasional eel fishing, which prevents them from accepting the logbooks). In Santo André lagoon, two fishermen failed to deliver their logbooks due to personal problems; and an effort was done to find other volunteers, but it was unsuccessful.  In Mondego and Santo André lagoon, number of sites planned was 20 (in one season - Spring) respectively with electric fishing and experimental fishing (traps). But to cover all planned life stages, number of sites achieved was 40 (20 sites in each of two seasons - Spring and Autumn).  The number of 100 eels planned for biological sampling was not achieved in the Mondego basin. Only 70 eels were sampled because the number of eels caught in the estuary was very low. It was not possible to obtain the biological sampling planned for the estuary despite having increased the effort of experimental fishing (traps) in the estuary (increased from 2 per each of 20 sites per one season - Spring, to 4 per each of 20 sites per each of two seasons - Spring and Autumn), and having tried to purchase eels from fishers. |

Section 1: Biological Data

Text box 1F: Incidental by-catch of birds, mammals, reptiles and fish

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| General Comment: This box fulfils paragraph 3 point (a) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910, on the multiannual Union programme; and Article 2 of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is applicable to the Annual Report. This box is applicable only for those sections where Member States have reported that they have been carrying out regular sampling. Results and deviations for Pilot studies should be reported under Pilot Study 2. |
| **General comment for all Regions:**  In the four columns “Fish”, “Mammals”, “Birds”, “Reptiles”, “Other” under the header “Has there been occurrence of bycatch?” we considered the question to be: “have recorded (fish/mammals/birds/reptiles/others) incidentally by-caught individuals” (since this is allowed by the guidance document).  The guidance document also allows to fill these four columns considering the question as: “there was observation effort for bycatch”. But we did not follow that option, because answering to both questions in the same column would make the answer confusing. The answer to this second question can be obtained by looking at the column “Number of PSU sampled in which observers have been instructed to look for bycatch” and “Does your sampling protocol allow for the calculation of observation effort “at haul level” (Y/N)”: if the first of these columns is above zero and the second of these columns is “Y” then the answer to this question is “Y”.  Topics 1 and 2 are presented separately per Region - RFMO/RFO/IO. Topic 3 is presented combined for all Regions - RFMO/RFO/IO.  **Region “Southern Western waters (ICES zones VIII, IX)” - RFMO/RFO/IO “ICES”:**  At-market sampling:  **1. Results**  Incidental bycatch of PETS were:  -Fishes: *Alosa alosa* (ASD), *Alosa fallax* (TSD).  **2. Deviations from Work Plan**  In some Schemes percentage of achievement was below planned. This limitation was mostly due to logistical issues especially concerning the travel of scientific observers to the ports.  “Species focus - Size category: At market” / “PTM9 - SF\_SC (main ports)”  “Trawlers for crustaceans: At-market” / “PTM17 - OTB\_CRU (1 port)”  At-sea sampling:  **1. Results**  See “2. Deviations from Work Plan”.  **2. Deviations from Work Plan**  Onboard sampling in ICES IXa could not be done due to the COVID19 pandemic, with the exception of a few sampling trips (in Q4 in some Schemes). Incidental bycatch events could not be determined in time for the AR. Trips were only sampled in Q4 due to the COVID19 pandemic, and were done by scientific observers from an external company hired for this purpose. This procedure is new for onboard sampling in ICES IXa and there was a delay in data recording in the database.  In some Schemes percentage of achievement was below planned:  “Gill and trammel nets for demersal fish: At-sea" / “PTS3 - GNS\_GTR\_DEF (vessel length > 12m)”  “Trawlers for demersal fish: At-sea" / " PTS12 - OTB\_DEF (vessel length > 24m)"  "Trawlers for crustaceans: At-sea" / " PTS15 - OTB\_CRU (vessel length > 12m)"  “Purse seiners for sardine and other small pelagic fish: At-sea" / "PTS18 - PS\_SPF (vessel length > 12m)"  In some schemes achieved number of PSU was 0:  "Longline for black scabbardfish: At-sea" / " PTS9 - LLS\_DWS (vessel length >12m)"  "Beam trawl for shrimps: At-sea" / " PTS21 - TBB\_MCD"  **Region “Southern Western waters (waters around Azores)” - RFMO/RFO/IO “ICES”:**  At-market sampling:  **1. Results**  Several of the fisheries conducted at waters around Azores regularly captures a variety of species included in Table 1D EU-MAP which have high commercial interest such as: *Beryx* spp., *Helicolenus dactylopterus*, *Lepidopus caudatus*, *Molva dypterygia*, *Mora moro* and *Polyprion americanus*.  For this reason, these species are not considered by-catch even being relevant species for deep water fisheries. Therefore, the results presented (Table 1) are for commercial species with a status (legal framework) of High priority or Vulnerable species in the Table 1D where At-market sampling show a reduced number of by-catch species. No species included in Table 1D of Commission Delegated Decision 2019/910 was observed as a by-catch on fishery using PS\_SPF. Grappling of Patellidae only targets commercial species, being both *Patella aspera* and *Patella candei,* and only *Lepidopus caudatus* was observed on LHP\_CEP.  Table 1 – Number of samples with occurrence of by-catch, per stratum ID code and species for at-market sampling in 2021 at Azores grounds.   |  |  |  | | --- | --- | --- | | **Stratum ID code** | **Table 1D EU-MAP** | **N samples** | | AZM1 - LHP\_FIF | *Epigonus telescopus* | 1 | |  | *Galeorhinus galeus* | 10 | |  | *Raja clavata* | 52 | | AZM22 - GNS\_FIF | *Galeorhinus galeus* | 3 | | AZM27 - FPO | *Raja clavata* | 4 | | AZM43 - LLS\_DWS\_<12m | *Epigonus telescopus* | 21 | |  | *Galeorhinus galeus* | 21 | |  | *Raja clavata* | 21 | | AZM45 - LLS\_DWS\_>12m | *Epigonus telescopus* | 9 | |  | *Galeorhinus galeus* | 5 | |  | *Raja clavata* | 10 |   **2. Deviations from Work Plan**  No relevant deviations.  At-sea sampling:  **1. Results**  Several of the fisheries conducted at waters around Azores regularly captures a variety of species included in Table 1D EU-MAP which have commercial interest such as: *Beryx* spp., *Helicolenus dactylopterus*, *Lepidopus caudatus,* *Molva dypterygia*, *Mora moro* and *Polyprion americanus.* For this reason, these species are not considered by-catch even being relevant species for deep water fisheries. Therefore, the results presented (Table 2) are for commercial and non-commercial species with a status (legal framework) of High priority or Vulnerable species in the Table 1D.  At-sea sampling on vessels using LHP\_CEP and PS\_SPF show a reduced number of species by-caught. No species included in Table 1D of Commission Delegated Decision 2019/910 was observed as a by-catch on PS\_SPF trips and only *Lepidopus caudatus* was observed on LHP\_CEP trips.  Only 1 observed trip on vessels using FPO registered by-catch of species included in Table 1D EU-MAP. A total of eight fishing operations using GNS\_FIF (19%) have recorded seven incidentally by-caught species according to Table 1D of the multiannual Union programme, which represent 26% of all by-caught species identified.  LHP\_FIF and LLS\_DWS regularly captures several species included in Table 1D EU-MAP once they consist of multispecific fisheries, with several target species, exploring deeper fishing grounds and consequently catching a wider species composition. Aside from the species with high commercial value, the proportion of fishing operations were by-catch of fish was recorded represents 54%, 88% and 100% when using LHP\_FIF, LLS\_DWS\_<12m and LLS\_DWS\_>12m, respectively.  Table 2 – Number of samples (fishing operations) with occurrence of by-catch, per stratum ID code and species for at-sea sampling in 2021 at Azores grounds.   |  |  |  | | --- | --- | --- | | **Stratum ID code** | **Table 1D EU-MAP** | **N samples** | | AZS4 - LHP\_FIF | *Baitoidea*1 | 1 | |  | *Galeorhinus galeus* | 3 | |  | *Macrouridae*3 | 1 | |  | *Raja clavata* | 10 | | AZS23 - GNS\_FIF | *Baitoidea*1 | 4 | |  | *Caretta caretta* | 1 | |  | *Galeorhinus galeus* | 1 | |  | *Pteroplatytrygon violacea* | 1 | |  | *Raja clavata* | 2 | |  | *Sphyrna zygaena* | 1 | | AZS28 - FPO | *Chaceon affinis* | 3 | |  | *Dalatias licha* | 1 | | AZS47 - LLS\_DWS\_<12m | *Baitoidea*1 | 2 | |  | *Dalatias licha* | 4 | |  | *Deania calcea* | 6 | |  | *Epigonus telescopus* | 2 | |  | *Etmopterus pusillus* | 4 | |  | *Etmopterus spinax* | 9 | |  | *Galeorhinus galeus* | 7 | |  | *Macrouridae*3 | 16 | |  | *Raja clavata* | 15 | |  | *Selachii*2 | 4 | | AZS49 - LLS\_DWS\_>12m | *Baitoidea*1 | 1 | |  | *Centroscymnus granulosus* | 7 | |  | *Centroscymnus crepidater* | 1 | |  | *Dalatias licha* | 22 | |  | *Deania calcea* | 10 | |  | *Epigonus telescopus* | 6 | |  | *Etmopterus pusillus* | 8 | |  | *Etmopterus spinax* | 17 | |  | *Galeorhinus galeus* | 1 | |  | *Hexanchus griseus* | 1 | |  | *Hoplostethus mediterraneus* | 2 | |  | *Macrouridae*3 | 20 | |  | *Raja clavata* | 5 | |  | *Selachii*2 | 6 |   1: *Dasyatis* *pastinaca* or *Myliobatis* *aquila* or *Leucoraja* *fullonica* / 2: *Coelorhinchus* *caelorhinchus* or *Nezumia* *aequalis* / 3: *Deania* *profundorum* or *Prionace* *glauca*  **2. Deviations from Work Plan**  No relevant deviations, although oversampling occurred for LHP\_FIF, PS\_SPF and GNS\_FIF. This was due to planned number of PSU (i.e., trip) per Scheme / Stratum ID code for 2020 being carried over to 2021 because of severe weather conditions in November and December 2020 (when procedures for sampling at sea resumed due to COVID-19), and so that observers would not be in breach of signed contracts. Because of the time window when this decision occurred, this situation isn´t provided in the WP 2020-21 revised for 2021 submitted by 30th October 2020. This situation did not lead to extra expenses.  **Region “Southern Western waters (waters around Madeira)” - RFMO/RFO/IO “CECAF”:**  At-market sampling:  **1. Results**  At-market incidental bycatch samples per species, for Stratum ID code DWF1\_M1 and SPF1\_M2 are presented in Table 3. Regarding the Stratum ID code MOL1\_ M4 there was no occurrence of bycatch once the catches are carried out by hand harvesting.  Table 3 – Number of at-market incidental bycatch samples, by species and Stratum ID code, in Madeira waters.   |  |  |  | | --- | --- | --- | | **Stratum ID code** | **Bycatch species** | **N samples** | | DWF1\_M1 | *Xiphias gladius* | 3 | |  | *Ruvettus pretiosus* | 4 | |  | *Epigonus telescopus* | 13 | |  | *Brama brama* | 1 | |  | *Promethichthys prometheus* | 2 | |  | *Lepidocybium flavobrunneum* | 2 | | SPF1\_M2 | *Galeorhinus galeus* | 1 |   **2. Deviations from Work Plan**  No deviations to report.  At-sea sampling:  **1. Results**  At-sea Stratum ID code DWF2\_M1 was sampled contrarily to Stratum ID code SPF2\_M2. The number of samples for incidental catches by species for Stratum ID code DWF2\_M1 are presented in Table 4.  Table 4 – Number of at-sea incidental bycatch samples, by species for Stratum ID code DWF2\_M1, in Madeira waters.   |  |  |  | | --- | --- | --- | | **Stratum ID code** | **Bycatch species** | **N samples** | | DWF2\_M1 | *Prionace glauca* | 1 | |  | *Centrophorus squamosus* | 13 | |  | *Etmopterus pusillus* | 2 | |  | *Heptranchias perlo* | 1 | |  | *Zameus squamulosus* | 2 | |  | *Brama brama* | 2 | |  | *Taractichthys longipinnis* | 1 | |  | *Naucrates ductor* | 1 | |  | *Chiasmodon niger* | 211 | |  | *Ruvettus pretiosus* | 1 |   **2. Deviations from Work Plan**  On board sampling could not be performed in the first quarter of 2021 due to Covid-19 pandemic. In addition, the establishment of the on-board observer program was not possible for the Stratum ID code SPF2\_M2 due to failures in its implementation. Further contributed to deviations from work plan the sharp reduction in fishing trips for the Stratum ID code SPF2\_M2 (54%).  **Region “Eastern Arctic” - RFMO/RFO/IO “ICES”:**  **1. Results**  Training of scientific observers for recording incidental bycatch of PETS in a consistent manner, following a sampling protocol, started in 2021.  No incidental bycatch of PETS.  **2. Deviations from Work Plan**  Training of scientific observers for recording incidental bycatch of PETS in a consistent manner, following a sampling protocol, started in 2021 and is continuing in 2022-2024.  **Region “Other regions” - RFMO/RFO/IO “ICCAT”:**  At-market sampling  Mainland (Atlantic Ocean and adjacent seas, BFT58) - respectively Stratum ID Code PTM25 - LLD\_LPF (longline), PTM27 - FPN\_LPF (tuna traps)  **1. Results**  Incidental bycatch species were:  -Bony fishes (sensu non-target species): *Coryphaena hippurus* (DOL), *Lampris guttatus* (LAG), *Lepidocybium flavobrunneum* (LEC), *Ruvettus pretiosus* (OIL), *Taractichthys longipinnis* (TAL), *Taractes rubescens* (TCR), *Polyprion americanus* (WRF).  **2. Deviations from Work Plan**  No relevant deviations.  Azores (Azores grounds) - Stratum ID Code AZM24 - LHP\_LPF \_<12m; AZM25 - LHP\_LPF \_>12m (poles and lines); AZM29 – LLD\_LPF (longline)  **1. Results**  No species included in Table 1D of Commission Delegated Decision 2019/910 was observed as incidental by-catch on fisheries using LHP\_LPF\_<12m, LHP\_LPF\_>12m and LLD\_LPF.  **2. Deviations from Work Plan**  No relevant deviations.  Madeira (CECAF 34.1.2.) - Stratum ID Code LPF1\_ M3 (poles and lines)  **1. Results**  The at-market incidental bycatch samples for species for Stratum ID code LPF1\_M3 are presented in Table 5.  Table 5 – Number of incidental bycatch samples on-shore, by species and Stratum ID code LPF1\_M3 in Madeira waters.   |  |  |  | | --- | --- | --- | | **Stratum ID code** | **Bycatch species** | **N samples** | | LPF1\_ M3 | *Galeorhinus galeus* | 1 | |  | *Xiphias gladius* | 19 | |  | *Coryphaena hippurus* | 7 |   **2. Deviations from Work Plan**  No deviations to report.  At-sea sampling  ICCAT longline - Mainland (Atlantic Ocean and adjacent seas) - Stratum ID Code PTS26 - LLD\_LPF  **1. Results**  Incidental bycatch species were:  -Mammals: *Steno bredanensis* (RTD)  -Birds: No incidental bycatch.  -Reptiles: *Caretta caretta (TTL)*, *Dermochelys coriacea (DKK)*, *Lepidochelys olivacea (LKV)*  -Bony fishes (sensu non-target species): *Acanthocybium solandri* (WAH), *Alepisaurus ferox* (ALX), *Brama brama* (POA), *Coryphaena equiselis* (CFW), *Coryphaena hippurus* (DOL), *Katsuwonus pelamis* (SKJ), *Lepidocybium flavobrunneum* (LEC), *Merluccius merluccius* (HKE), *Mola mola* (MOX), *Polyprion americanus* (WRF), *Ruvettus pretiosus* (OIL), *Taractichthys longipinnis* (TAL).  -Elasmobranchs (sensu non-target species; including prohibited catch/discards): *Alopias superciliosus* (BTH), *Carcharhinus falciformis* (FAL), *Carcharhinus longimanus* (OCS), *Pteroplatytrygon violacea* (PLS), *Isurus paucus* (LMA), *Lamna nasus* (POR), *Mobula mobular* (RMM), *Pseudocarcharias kamoharai* (PSK), *Sphyrna zygaena* (SPZ).  **2. Deviations from Work Plan**  No deviations from Work Plan.  ICCAT longline - Azores (Azores grounds) - AZS31 – LLD\_LPF  **1. Results**  At-sea sampling of species included in Table 1D of Commission Delegated Decision 2019/910 by-caught on vessels using LLD\_LPF, as well as number of samples, are presented in Table 6. By-catch occurred in every fishing operation observed under the remit of DCF data collection and 63% of the non-target species are protected under Union or international law.  Table 6 – Number of samples with occurrence of by-catch, per stratum ID code and species for at-sea sampling in 2021 at Azores grounds.   |  |  |  | | --- | --- | --- | | **Stratum ID code** | **Table 1D EU-MAP** | **N samples** | | AZS31 - LLD\_LPF | *Alopias superciliosus* | 5 | |  | *Caretta caretta* | 1 | |  | *Cetacea*4 | 1 | |  | *Dermochelys coriacea* | 1 | |  | *Isurus oxyrhinchus* | 11 | |  | *Isurus paucus* | 3 | |  | *Lamna nasus* | 2 | |  | *Nesiarchus nasutus* | 1 | |  | *Polyprion americanus* | 1 | |  | *Pteroplatytrygon violacea* | 1 | |  | *Thunnus thynnus* | 5 | |  | *Selachii*2 | 7 | |  | *Sphyrna zygaena* | 1 |   2: *Prionace* *glauca* / 4: *Stenella coeruleoalba*  **2. Deviations from Work Plan**  No relevant deviations, although oversampling occurred. Achieved results refer to the boarding of observers in the remit of DCF and COSTA (Consolidating Sea Turtle Conservation in the Azores) project funded by the Marine Turtle Conservation Fund of the US Fish and Wildlife Service and the Archie Carr Center for Sea Turtle Research.  While sampling protocol of data collected by DCF allows for the calculation of observation effort ‘at haul level,’ the same does not apply to data collected within the scope of COSTA.  DCF sampling intensity was adapted due to planned number of PSU (i.e., trip) per Scheme / Stratum ID code for 2020 being carried over to 2021. The main reasons were the closure of this fishery by the time procedures for at-sea sampling resumed due to COVID-19 and so that observers would not be in breach of signed contracts. Because of the time window when this decision occurred, this situation isn´t provided in the WP 2020-21 revised for 2021 submitted by 30th October 2020. This situation did not lead to extra expenses.  ICCAT Baitboat - Madeira (CECAF 34.1.2) - LPF2\_ M3  **1. Results**  No sampling in 2021.  **2. Deviations from Work Plan**  On board sampling could not be performed in the first quarter of 2021, due to Covid-19 pandemic. Furthermore, the establishment of on-board observer program was not possible due to failures in its implementation.  **Region “Other regions” - RFMO/RFO/IO “IOTC”:**  **1. Results**  No sampling in 2021. Onboard sampling in IOTC could not be done due to the COVID19 pandemic.  **2. Deviations from Work Plan**  No sampling in 2021. Onboard sampling in IOTC could not be done due to the COVID19 pandemic.  **Region “Other regions” - RFMO/RFO/IO “NAFO”:**  **1. Results**  Training of scientific observers for recording incidental bycatch of PETS in a consistent manner, following a sampling protocol, started in 2021.  Incidental bycatch of PETS was:  -Elasmobranchs: *Somniosus microcephalus* (GSK).  **2. Deviations from Work Plan**  Training of scientific observers for recording incidental bycatch of PETS in a consistent manner, following a sampling protocol, started in 2021 and is continuing in 2022-2024.  **All regions**  **3. Data quality**  - In NAFO and ICES I,II, before 2021 scientific observers had not been instructed to record data on incidental by-catch of PETS. Training of observers for recording incidental bycatch of PETS in a consistent manner, started in 2021 and training is continuing in 2022-2024.  - There is no sampling protocol specifically directed to incidental by-catch of PETS; however, when PETS are observed during regular onboard or market sampling protocol (ICES IXa and X, ICCAT, IOTC, CECAF) they are registered. In NAFO and ICES I,II, there is no sampling protocol specifically directed to incidental by-catch of PETS; however training of observers started in 2021 and training is continuing in 2022-2024, aiming at when PETS are observed during regular onboard sampling they are registered in a consistent manner.  - Onboard observer protocol (ICES IXa, NAFO, ICES I,II), does not instruct to check for incidental bycatch of PETS at the opening of the codend in trawls. Not applicable in ICES X, ICCAT, IOTC, CECAF.  - Onboard observer protocol (ICES IXa and X, ICCAT, IOTC, CECAF) instructs to check for all catch (target + incidental bycatch + discards) during the hauling process in gill/trammel/traps/purse-seine nets/handline and longline. The sampled and non-sampled fraction of the gear is recorded in order to have estimates at haul level. Not applicable in NAFO and ICES I,II.  - The onboard observer protocol (ICCAT, IOTC) instructs to report on the use of mitigation (i.e. Escape Devices or Acoustic Deterrent Devices). This instruction is not applied in ICES Xa, X, CECAF, NAFO and ICES I,II.  - The sampling design and protocol (ICES IXa and X, ICCAT, IOTC, CECAF) follow recommendations from relevant expert groups (WGCATCH, SGPIDS, WKPICS, WKRDP). In NAFO and ICES I,II, training of observers for recording incidental bycatch of PETS in a consistent manner, started in 2021 and training is continuing in 2022-2024, aiming at following recommendations but still in development.  - As proposed in the Work Plan (ICES IXa and X, ICCAT, IOTC, CECAF), data is stored in national databases (Table 5A). Data not collected in NAFO and ICES I,II. Detailed data reported to ICES WGBYC, ICCAT, IOTC, NAFO and NEAFC. |

Section 1: Biological Data

Pilot Study 2.1 (PS2.1): Level of fishing and impact of fisheries on biological resources and marine ecosystem - ICES IXa

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| General comment: This Box fulfills paragraph 3 point (c) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2 and Article 4 paragraph (3) point (b) of the Implementing Decision (EU) 2016/1701 on the format of the WP. |
| General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study. |
| 1. Aim of pilot study   Exploited marine communities are impacted by fisheries and environmental drivers that may lead to changes across the food web. Detecting how marine biodiversity responds to fishing or other factors such as environmental changes require the analysis of long-term data on fish communities and fisheries. A first step is to characterize marine communities (group of interacting species populations occurring together in space and time) and assess how they vary in space and time as well as potential drivers that may affect their structure and abundance. For example, fisheries removals (landings and discards) may lead to changes in marine communities and food webs, by affecting species and size composition.  In the first phase of the pilot study we identified communities and assessed how they changed in space and time (along the Portuguese coast, i.e. ICES IXa; from 1990-2016). Additionally, we performed a preliminary mapping of fish biodiversity indices (for the period 2005-2016).  In the second phase of the pilot study, and based on the findings from the first phase, we will fully explore changes of fish biodiversity indices in space and time, and identify potentially existing fish biodiversity hotspots. Moreover, considering the possible interest of monitoring the identified hotspots, we will present an alternative revised sampling effort of research surveys. Additionally, we will evaluate the relationship between fish biodiversity indices and fishing pressure indicators (e.g. fishing effort).   1. Duration of pilot study   From January 2020 to December 2021.   1. Methodology and expected outcomes of pilot study   The following data sources will be used:   * Groundfish surveys data conducted by IPMA (and former institutes) from 2005 to 2016 along the Portuguese continental coast. * Landings, logbooks and vessel monitoring systems (VMS) data from trawl commercial vessels available from DGRM since 2004.   Groundfish survey data will be used to determine and map fish biodiversity indices. Spatio-temporal changes in fish biodiversity indices will be assessed through statistical modelling, and hotspots of fish biodiversity will be identified. Results will possibly highlight an interest in monitoring such hotspots, and an alternative revised sampling effort of research surveys will be developed aiming at this interest.  Pressure indicators (e.g. fishing effort) will be computed using fisheries dependent data, particularly landings, logbooks and VMS, and mapped to explore relationships with fish biodiversity indices. Results will indicate relevant pressure indicators, and relevant areas of high concern (e.g. high pressure) which is valuable information to take into account in the definition of sampling effort of research surveys.  *(max 900 words)* |
| Brief description of the results obtained (including deviations from planned and justifications as to why if this was not the case).  **4. Achievement of the original expected outcomes of pilot study and justification if this was not the case**  Several biodiversity indices were explored to study spatio-temporal variation of alfa- and beta-diversity of demersal communities in the Portuguese coast from 2005 to 2016 at 20-500 m deep, based on Groundfish survey data (Western IBTS 4th quarter – IBTS Q4 (PT-PGFS-Q4)). Fluctuations in biodiversity indices over time were observed in all areas with no clear patterns. Biodiversity is higher in the southern region, where communities were also found increasingly dissimilar over time. The same was also reported for shallow waters across the study area. Multivariate analyses suggest that biodiversity is lower in areas where fishing effort is higher. However, these results need to be further explored. Results obtained are still under analysis and will be made available through a scientific publication.  **5. Incorporation of results from pilot study into regular sampling by the MS**  This work will be complemented with the pilot study in the Work Plan 2022-2024 which will focus on the impact of fisheries on marine habitats. An assessment of the need/interest of changing regular sampling design and protocol of the Groundfish survey (Western IBTS 4th quarter – IBTS Q4 (PT-PGFS-Q4)) will be then evaluated. |

Pilot Study 2.2 (PS2.2): Level of fishing and impact of fisheries on biological resources and marine ecosystem - ICES X (waters around Azores)

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| General comment: This Box fulfills paragraph 3 point (c) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2 and Article 4 paragraph (3) point (b) of the Implementing Decision (EU) 2016/1701 on the format of the WP. |
| General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study. |
| 1. Aim of pilot study   The collection of data to estimate the level and impact of fishing on biological resources and marine ecosystems can meet the needs of several EU legislative instruments related to the protection of marine biodiversity and their habitats. The collection and use of biological, ecological, and socioeconomic data are maximized if added value to existing sampling programmes and multiple data products for different end-users and policy needs are developed.  Commission Decision (EU) 2017/8481 identifies that the data collection framework shall be used for monitoring under Descriptor 3, it may be used for the collection of relevant fisheries-related data under Descriptors 1, 4, and 6. However, articulation is needed between these two regulations.  This Pilot study enters into the picture because it is stated in EU-MAP that the "collection of data for estimating the level of fishing and the impact of fishing activities on marine biological resources and on marine ecosystems (such as effects on non-commercial species, predator-prey relationships and natural mortality of fish species), shall be first assessed within pilot studies".  This pilot study's main objectives are 1. to identify the gaps, improve the availability of data and tools on the existing sampling plans; 2. and determine future data collection specific for the Azores, based on end-user needs. Specifically, this pilot study aims to ensure the articulation and integration of (some of) the MSFD monitoring programmes with the ongoing sampling programmes, what is expected to happen at the next multi-annual WP submission (2022-2027). The data collection framework should contribute towards reaching the objectives of the common fisheries policy – which include (1) the protection of the marine environment, (2) the sustainable management of all commercially exploited species; (3) and in particular, the achievement of good environmental status in the marine environment.   1. Duration of pilot study   2021 (1 January until 31 December)  A preliminary progress report will be available in June 2021 to include some pilot study outcomes in the next multi-annual WP submission.   1. Methodology and expected outcomes of pilot study   A desk study will evaluate if the known criteria and methodological standards, specifications, and standardised methods for monitoring waters around the Azores, under MSFD, could be complemented (or implemented) under the DCF sampling protocols. A joint analysis with all stakeholders will be promoted to identify, within the work carried out under MSFD and DCF, which variables need to be added to the DCF sampling programmes, as well as stratification, and spatial and temporal aggregation of data to meet the requirements of the MSFD.  One of the outcomes will be identify projects for (possible) submission as future pilot studies that are directly relevant to the DCF and MSFD requirements to inform on the level of fishing and impact of fisheries on biological resources and marine ecosystem and to inform on future data collection programmes:  (1) Improve data collection protocols for non-commercial fish species;  (2) Evaluate the possible extension of the Continuous Plankton Recorder (CPR-SAHFOS) Survey, to the commercial fishing fleet of the Azores;  (3) To assess food spectra at the species level and to understand the prey-predator relationships doing stomach sampling (at least) from commercial samples;  (4) Use drift cameras in deep-water habitats and seamounts for image acquisition of a topographically complex environment, inaccessible for sampling;  (5) Analysis to measure the marine environment quality and health through pollutants in the water column and seafood and nutrients and phosphorus compounds in the water;  (6) Data-collection actions to monitor species at risk bycatch, namely deep-water sharks;  (7) Reproductive biology sampling (baseline) for the most exploited coastal species to evaluate the impacts of fishing on life-history traits and reproductive output of the populations.  Several other outcomes are expected during this pilot study:   * Complete the list of fish and cephalopod species at risk from incidental bycatch, taking into account EU-MAP Table 1D, to reflect métiers causing the most significant bycatch problems and PETS bycatch; * Include in the work plan the (already) identified data to be collected regarding the impact of fisheries:   + Biological data of other important species on a national (Azorean) scale for small-scale/local coastal fisheries;   + Biological data, bycatch fraction, on stocks caught by Azorean commercial fisheries;   + Water samples collected by onboard scientific observers for contaminants and nutrient analysis;   + Collect muscle samples from species subject to biological sampling;   + Record information on post-release vitality to determine bycatch mortality rate for the coastal species of released individuals;   + Record information on losing and finding of fishing gears and marine litter, in general. * Regarding detailed data on the activity of fishing vessels in waters around the Azores, it is expected (i) to know how to improve access to detailed data on the activity of fishing vessels (sales notes, fishing effort inquiries, logbooks, VMS data, AIS data, etc.); (ii) facilitate the cross-check of information from different sources; (iii) and also automate the process to achieve high quality and faster throughput of data products.   *(max 900 words)* |
| Brief description of the results obtained (including deviations from planned and justifications as to why if this was not the case).  It was planned a desk study to evaluate how the DCF could complement (or implement) the monitoring requirements of the MSFD for the Azores.  4. Achievement of the original expected outcomes of pilot study and justification if this was not the case  Joint analysis with all stakeholders was promoted to identify, within the work carried out under MSFD and DCF, which variables needed to be added to the DCF sampling programmes, stratification, and spatial and temporal aggregation of data to meet the requirements of the MSFD.  5. Incorporation of results from pilot study into regular sampling by the MS  The desk study led to the inclusion in the Portuguese 2022-2024 work plan, data to be collected regarding the impact of fisheries:   * Biological data of other important species on a national (Azorean) scale for small-scale/local coastal fisheries; * Biological data, bycatch fraction, on stocks caught by Azorean commercial fisheries; * Collect water samples by onboard scientific observers for contaminants and nutrient analysis; * Collect muscle samples from species subject to biological sampling; * Record information on post-release vitality to determine the bycatch mortality rate for the coastal species of released individuals; * Record information on losing and finding fishing gears and marine litter.   (max 900 words) |

Section 1: Biological Data

Text Box 1G: List of research surveys at sea

TB 1G.1 – Sardine, Anchovy, Horse Mackerel Acoustic Survey – PELAGO

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| General comment: This box fulfills Chapter I of the Annex of the Implementing Decision (EU) 2019/909, on the list of mandatory surveys and thresholds, of the multiannual Union programme; and Article 2 and Article 7 paragraph (3) of the Decision (EU) 2016/1701 on the format of the WP. It is intended to specify which reseach surveys at sea set out in the multiannual Union programme will be carried out. Member States shall specify whether the research survey is included in Chapter I of the Annex of the implementing decision of the multiannual Union programme or whether it is an additional survey. |
| General comment: This box is applicable to the Annual Report. This box should provide complementary information on the performance of the surveys, the results and their main use. |
| Survey included in Table 10.  1.1 Objectives of the survey  - To estimate the abundance, biomass and spatial distribution of sardine, anchovy and other small pelagic fishes, by length classes and age groups, presented in the Portuguese coast and Gulf of Cadiz.  - To estimate the spatial distribution and abundance of zooplankton, fish eggs and larvae distribution;  - To characterize the physical environment:sea surface temperature, salinity and fluorescence (3 m depth) and CTDF profiles;  - To perform a census of sea birds and marine mammals.  1.2 Methodology used on the Portuguese acoustic surveys  Equipment:  Simrad EK 60 - 38 KHz, split beam transducer 8º x 7º (equivalent beam angle: 10log⎠ = -20.2 dB; pulse duration = 1 ms), calibrated prior to the survey. Data storage and pos-processing software: ER60 and Movies+  Pelagic trawl (10 m vertical opening) and bottom trawl (NTC) to identify echoes, split acoustic energy and gather biological data. Opportunistic fishing hauls.  CUFES, continuous underway fish egg sampler, plus coupled temperature, salinity and fluorescence sensors.  Sample design:  Parallel systematic grid, 8 nmi apart (west coast), 6 nmi in Algarve; in Cadiz, not parallel, around 8 nm in the middle of the radials. The acoustic survey is made only during day. During night, opportunistic hydrology/plankton/ecology sampling is carried out, when possible. CUFES sampling continuously acquired along the transects.  Abundance estimates:  Survey area is divided into 4 zones: OCN (Caminha to Nazaré), OCS (Nazaré to Cape S. Vicente), ALG (S. Vicente to V. Real Sto. António) and CAD (V. Real to Cape Trafalgar).  The acoustic energy is split by trawl proportion (in number) taking into account the species TS’s, if direct energy extraction is not possible.  There are post-stratifications in coherent (length composition, density) areas for each species. Abundance estimation is calculated in number of individuals, by length class, in each coherent area. The hauls are combined in this area, usually without weighting. Biomass estimation is calculated using weight/length relationship. Estimated abundance by age groups is calculated using age/length key, extracted from the otoliths reading.  Manual:  PELAGO survey is coordinated by ICES WGACEGG (<http://www.ices.dk/community/groups/Pages/WGACEGG.aspx>). ICES manual for Acoustic surveys (Series of ICES Survey Protocols) submitted for publication to ICES TIMES (Techniques in Marine Environmental Sciences) Survey Protocols Series.    https://lh5.googleusercontent.com/sHjSzkwepTJFXisxsTCmwgO0ll2rLUr376sBoJJlxp2EMqwsbF9KXJpxPp5cIdlHV9BKcyzgi7SPxDmltrXvOAtxL86Mzn2k6wSk1RPeLXffkD4dsC7EbQih7tsIAYQdY0p_55vH  Figure 1G.1.1 - Portuguese acoustic transects and considered areas, for the abundance estimation. |
| 1. Graphical representation (map) showing the positions (locations) of the realized samples.     Figure 1G.1.2 - Portuguese acoustic transects and considered areas for the abundance estimation in Pelago21.    Figure 1G.1.3 - Fishing stations operated with Pelagic trawl by the research vessel (AP) and with purse-seine net by the fishing industry purse-seiner (CER) in Pelago21.   1. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.   The latest meeting report of the coordination group – WGACEGG will be delivered soon  The Portuguese report may be found here: [Microsoft Word - Relatório Acústico da Campanha PNAB-PELAGO21\_07DEZ21 (ipma.pt)](https://www.ipma.pt/export/sites/ipma/bin/docs/relatorios/pescas.mar/Campanha-PNAB-PELAGO21.pdf)   1. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).  * Abundance and biomass estimates at age and distribution of sardine, anchovy and chub mackerel * Sardine and anchovy egg distribution and abundance * Environmental indicators (temperature, salinity and chlorophyll) * Census of marine mammals and birds   9. Extended comments (Tables 1G and 1H)  No additional comments. |

TB 1G.2 – Western IBTS 4th quarter

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| General comment: This box fulfills Chapter I of the Annex of the Implementing Decision (EU) 2019/909, on the list of mandatory surveys and thresholds, of the multiannual Union programme; and Article 2 and Article 7 paragraph (3) of the Decision (EU) 2016/1701 on the format of the WP. It is intended to specify which reseach surveys at sea set out in the multiannual Union programme will be carried out. Member States shall specify whether the research survey is included in Chapter I of the Annex of the implementing decision of the multiannual Union programme or whether it is an additional survey. |
| General comment: This box is applicable to the Annual Report. This box should provide complementary information on the performance of the surveys, the results and their main use. |
| Survey included in Table 10.  2.1 Objectives of the survey  The Portuguese groundfish surveys have been conducted since 1979, continuously in autumn, with R/V "Noruega". The main objectives are to estimate the abundance and distribution of the most important commercial species in the Portuguese trawl fishery: hake, horse mackerel and blue whiting. The recruitment indices of abundance and distribution for hake and horse mackerel are also evaluated. Data for other species are collected, for biodiversity purposes.  2.2 Description of the methods used in the survey  The present sampling scheme was implemented in 2005, based on a systematic and stratified random sampling, to facilitate the use of geostatistical models and to overcome the difficulties in the estimation of the variance. It includes depths from 20 to 500 m with a mixed sampling scheme composed by 66 trawl positions distributed over a fixed grid with 5’ per 5’ miles, corresponding to trawl positions already done, and 30 random trawl positions, with tow duration of 30 minutes. At the end of each haul, a CTD station is performed to collect data on physical parameters.  The Portuguese surveys cover Division IXa in Portuguese waters. The surveyed area extends from latitude 41°20' N to 36°30' N, and from 20 to 500 m depth. The surveys are carried out with the R/V Noruega, which is a stern trawler of 47.5 m length, 1500 horse power and 495 G.T.R. The used fishing gear is a bottom trawl (type Norwegian Campell Trawl 1800/96 NCT) with a 20 mm codend mesh size. The main characteristic of this gear is the groundrope with bobbins. The mean vertical opening is 4.6 m and the mean horizontal opening between wings and doors is 15.1 m and 45.7 m, respectively. The polyvalent trawl doors are rectangular (2.7 m x 1.58 m) with an area of 3.75 m2 and weighting 650 Kg.  Manual:  PTGFS IBTSQ4 is coordinated by ICES IBTSWG.  ICES, 2010. Manual for the International Bottom Trawl Surveys in the Western and Southern Areas Revision III Agreed during the meeting of the International Bottom Trawl Survey Working Group 22–26 March 2010, Lisbon. Addendum 2: ICES CM 2010/SSGESST: 06. 58 pp.  https://lh5.googleusercontent.com/4b-s4tj57ngOZBH7gHzPsi6iMXoMfnFvStoO26VzXBvWECSl5R87nqPY-IyKgfSW1zYmW5shKJodjKZo-bT8HYBydCpFiaNGfgvMrcKGbTVud7ZLKKQB2gD77D7MTId5d1ScdSqV  Figure 1G.2.1 **-** Western IBTS 4th quarter – IBTS Q4. Sampling grid. |
| 1. Graphical representation (map) showing the positions (locations) of the realized samples.     Figure 1G.2.2 - Valid and invalid fishing hauls performed during Western IBTS 4th quarter – IBTS Q4 (PT-PGFS-Q4) 2021 survey (93 valid out of 96 planned hauls).   1. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.  * 2020 data: ICES (2021): International Bottom Trawl Survey Working Group (IBTSWG). ICES Scientific Reports. Report. <https://doi.org/10.17895/ices.pub.8219> * 2021 data will be delivered soon   Survey Manual: ICES (2017): SISP 15 - Manual of the IBTS North Eastern Atlantic Surveys. Browse ICES content by Type. Report. <https://doi.org/10.17895/ices.pub.3519>   1. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).  * Abundance and biomass estimates by length/age for European hake, horse mackerel, blue whiting, blue jack mackerel, mackerel, chub mackerel, bluemouth, Norway lobster, cephalopods and elasmobranchs; * Geographical distribution of demersal species; * Biodiversity estimators for MSFD indicators, and; * Litter data for ICES database   9. Extended comments (Tables 1G and 1H)  No additional comments. |

TB 1G.3 – Nephrops Survey Offshore Portugal NepS (NepS (FU 28-29))

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| General comment: This box fulfills Chapter I of the Annex of the Implementing Decision (EU) 2019/909, on the list of mandatory surveys and thresholds, of the multiannual Union programme; and Article 2 and Article 7 paragraph (3) of the Decision (EU) 2016/1701 on the format of the WP. It is intended to specify which reseach surveys at sea set out in the multiannual Union programme will be carried out. Member States shall specify whether the research survey is included in Chapter I of the Annex of the implementing decision of the multiannual Union programme or whether it is an additional survey. |
| General comment: This box is applicable to the Annual Report. This box should provide complementary information on the performance of the surveys, the results and their main use. |
| Survey included in Table 10.  3.1 Objectives of the survey  The main objectives of the survey are to estimate the abundance, and to study the distribution and the biological characteristics of the main crustacean species, namely *Nephrops norvegicus* (Norway lobster), *Parapenaeus longirostris* (rose shrimp) and *Aristeus antenn*atus (red shrimp).  3.2 Description of the methods used in the survey  The crustacean surveys are the only independent mean of assessing the status of the Portuguese crustacean resources. Surveys have been carried out since the early 80’s using IPMA (formerly IPIMAR) research vessels. These surveys usually take place during the second quarter, generally late May - early July.  The sampling grid was designed to cover the main crustacean fishing grounds within the range of 200 - 750 m. The substrate in these grounds is characterized by muddy sediments composed by different percentages of silt and clay.  Each rectangle has 6.6 minutes of latitude x 5.5 minutes of longitude for the SW coast and vice-versa for the south coast, corresponding approx. to 33 nm2. The abundance observed at a particular point within the rectangle will reflect the relative abundance of the resource at that geographical area and it is assigned to the centre of the rectangle. The stations may be grouped a posteriori in the strata used previously and the results compared with the former surveys.  The grid has been updated to include areas where fishing is known to occur, and to exclude others where the target species do not occur or non trawlable areas, based on the definition of the fishing grounds through VMS fishing records. The new grid is composed by 80 rectangles in total, with 22 in FU 28 and 58 in FU29. Figure 1G.3.1 shows the grid overlaying the fishing grounds, highlighting the changes. The areas deeper than 750 m, where the scarlet prawn occurs, are not covered.   * Start time of the haul is defined as the moment when the vertical net-opening and door spread are stable. Stop time is defined as the start of pull back. The haul duration is 30 minutes. Hauls with duration lower than 15 minutes are not considered valid. * Hauls are carried during daylight at a mean speed of 2.8-3.0 knots. * Sensors to monitor the trawl net parameters (wings/doors spread, horizontal and vertical openings, depth) are sometimes used and expected to be used on a regular basis from 2015 onwards.   https://lh4.googleusercontent.com/y557mX0ManY3YzJBbUYCsBwN0sH5Ng2OVQH3VX9KFpmyiFggWMRQpTM46UMSJ_CfpZUhbAklXDK04oQbn2l6T4wocdaOCpJuLvVvHHbxV8ZnodCYQ5ERi2e7VDikBcyT2PlPACok  Figure 1G.3.1 - Survey grid in FUs 28 and 29 overlaying the crustacean fishing grounds represented by VMS records (in grey). The red-dashed rectangles were added to the grid survey, the black-dashed rectangles were removed. The sectors used in the previous stratified design are delimited by dashed lines and labelled.  Manual:  NepS (FU 28-29) survey is coordinated by ICES WGNEPS. ICES manual for the survey (Series of ICES Survey Protocols) was published as Annex 8.3 of the WGNEPS 2018 report.  References  ICES. 2018. Report of the Working Group on Nephrops Surveys (WGNEPS). 6-8 November. Lorient, France. ICES CM 2018/EOSG:18. 226 pp.  <http://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2018/WGNEPS/WGNEPS%20report%202018.pdf> |
| 1. Graphical representation (map) showing the positions (locations) of the realized samples.     Figure 1G.3.2 – Valid hauls performed during Nephrops Survey Offshore Portugal NepS (NepS (FU 28-29)) in 2021. FU 28 was covered in only 36% of the planned hauls due to engine failure.   1. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.   Report of the coordinating body:  ICES. 2022. Working Group on Nephrops Surveys (WGNEPS; outputs from 2021). ICES Scientific Reports. 4:29. 183pp. <http://doi.org/10.17895/ices.pub.19438472>   1. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators)  * Abundance and biomass estimates of Norway lobster, deepwater rose shrimp and other crustacean species. * Geographical distribution of demersal species. * Biodiversity estimators for MSFD indicators (D1). * Marine litter distribution for MSFD (D10)   9. Extended comments (Tables 1G and 1H)  The survey was conducted with a new vessel, using the same gear but different trawl doors. Some operational issues were detected and must be corrected. The results shall be considered preliminary until more analyses on trawl performance are made. |

TB 1G.4 – Sardine Daily Egg Production Method (DEPM PIL)

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| General comment: This box fulfills Chapter I of the Annex of the Implementing Decision (EU) 2019/909, on the list of mandatory surveys and thresholds, of the multiannual Union programme; and Article 2 and Article 7 paragraph (3) of the Decision (EU) 2016/1701 on the format of the WP. It is intended to specify which reseach surveys at sea set out in the multiannual Union programme will be carried out. Member States shall specify whether the research survey is included in Chapter I of the Annex of the implementing decision of the multiannual Union programme or whether it is an additional survey. |
| General comment: This box is applicable to the Annual Report. This box should provide complementary information on the performance of the surveys, the results and their main use. |
| Survey included in Table 10.  4.1 Objectives of the survey  Estimate the spawning stock biomass (SSB) of the Atlanto-Iberian sardine stock (ICES VIIIc and IXa), using the Daily Egg Production Method (DEPM).  4.2 Description of the methods used in the survey  The DEPM survey involves vertical ichthyoplankton sampling on fixed stations with a CalVET (=PairoVET) net. Simultaneously, the auxiliary CUFES system operates underway (between the CalVET (=PairoVET) stations), pumping water from approximately 3 m from the surface and plankton samples are collected every 3nmiles. Both samplers follow a predefined grid of fixed transects perpendicular to the coast and spaced 8 nm, covering the platform at least until the 200 m isobath (Fig. 1G.4.1). Decisions on the offshore limit of surveying are made, adaptively, depending on the egg presence observed onboard in the samples obtained by the CUFES system. All ichthyoplankton samples (CalVET (=PairoVET) and CUFES) are preserved, and subsequently analysed in laboratory. Concurrently to the plankton sampling with the CalVET (=PairoVET) and the CUFES, environmental data (temperature and salinity and fluorescence) are recorded by the sensors measuring surface water variables and the CTDF coupled to the CalVET (=PairoVET) system for temperature, salinity and fluorescence profiling. These samples are then used in view of:  - Quantifying and classifying by per developmental stage sardine eggs observed over the whole surveyed area;  - Delimiting and estimating the spawning area of sardine;  - Estimating daily egg production.  Simultaneously with the ichthyoplankton sampling, fishing hauls are conducted by pelagic or bottom trawling, opportunistically, following the information provided by the RV echo-sounder. Their number and spatial distribution aim at ensuring a good and homogeneous coverage of the survey area and an adequate representation of the population demography and distribution. Samples collected by the RV are often complemented with samples obtained from the commercial purse-seine fleet at the main landing harbours, during the period of the survey. Immediately after trawling, sardine fish samples are processed onboard the RV, individual biological information is recorded, and biological material is collected and preserved for subsequent histological processing in laboratory.  The collected data and material are used to estimate adult parameters (sex ratio, mean female weight, mean batch fecundity and spawning fraction) within the mature component of the population, and subsequently calculate sardine daily fecundity.  Manual:  DEPM PIL survey is coordinated by ICES WGACEGG  (<http://www.ices.dk/community/groups/Pages/WGACEGG.aspx>).  ICES manual for DEPM survey (Series of ICES Survey Protocols) submitted for publication to ICES TIMES (Techniques in Marine Environmental Sciences) Survey Protocols Series.   1. Description of the participating Member States/vessels and the relevant international group in charge of planning the survey   Sardine DEPM survey is coordinated internationally under the auspices of the ICES WGACEGG; Portuguese survey carried out jointly with the Spanish survey (from the Instituto Español de Oceanografía, IEO) in order to cover the Atlanto-Iberian sardine stock area (VIIIc, IXa).  map_pil_pnab  Figure 1G.4.1– Sardine DEPM (Triennial) - Sampling grid. |
| 1. Graphical representation (map) showing the positions (locations) of the realized samples.   Triennial; Not planned for 2021   1. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.   Triennial; Not planned for 2021   1. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).   Triennial; Not planned for 2021  9. Extended comments (Tables 1G and 1H)  No additional comments. |

TB 1G.5 – Flemish Cap Groundfish survey (FCGS)

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| General comment: This box fulfills Chapter I of the Annex of the Implementing Decision (EU) 2019/909, on the list of mandatory surveys and thresholds, of the multiannual Union programme; and Article 2 and Article 7 paragraph (3) of the Decision (EU) 2016/1701 on the format of the WP. It is intended to specify which reseach surveys at sea set out in the multiannual Union programme will be carried out. Member States shall specify whether the research survey is included in Chapter I of the Annex of the implementing decision of the multiannual Union programme or whether it is an additional survey. |
| General comment: This box is applicable to the Annual Report. This box should provide complementary information on the performance of the surveys, the results and their main use. |
| Survey included in Table 10.  6.1 Objectives of the survey  The main objectives of the survey are the estimation of abundance and biomass index of the target species, as well as the knowledge of their population demographic structure and the oceanographic conditions on the Flemish Cap Bank (NAFO Division 3M). For this purpose, the following tasks were implemented:  -      Detailed length distribution and biological sampling of the catch for each target species, recording length, weight, sex, and the collection of otoliths and gonads. For other species only length and length-weight sampling were performed.  -      Observation of the oceanographic conditions on the Bank. The collection of oceanographic data (temperature and salinity) was carried out mainly through the CTD profiling; with a grid-pattern design, placing CTD stations separated 15 nautical miles, both in latitude and longitude, with the aim of covering the whole Bank.  ·             - Feeding analysis of most abundant species, to be done every two years.  ·             - Sampling of invertebrates, with special attention to corals and sponges, to allow identification of                        potentially vulnerable marine ecosystems.  Target species:  -       Cod, roughhead grenadier, redfish, American plaice, Greenland halibut and northern shrimp.  6.2 Description of the methods used in the survey  Bottom trawl fishing hauls that last for 30 minutes and are distributed using a stratified random sampling scheme. The used trawling gear is the ‘Lofoten’ (Vázquez *et al*, 2014).  Temperature and salinity profiles are taken with a CTD according to a predefined square grid.  The survey starts in the second half of June, and needs 35 days at sea.  Manual: <https://www.nafo.int/Library/Documents-chronological/nafo-sc-studies-no-46-2014>    Figure 1G.6.1 **-** Flemish Cap Groundfish Survey, FCGS (RV Vizconde d’Eza). Sampling grid. Coral and sponge protection areas (red squares); valid hauls (green circles); invalid hauls (red crosses).  6.3 Description of the participating Member States/vessels and the relevant international group in charge of planning the survey   * Spain + Portugal; RV Vizconde de Eza; * Portuguese-Spanish surveys in Flemish Cap - coordination meeting for the survey.   6.4 Description of the international task sharing (physical and/or financial) and the cost sharing agreement used  Spain contributes with vessel, staff and samples analysis in laboratory and Portugal contributes with staff and samples analysis in laboratory.  There is no signed agreement about task sharing, but long-term bilateral collaboration.  References  Vázquez, A., J. Miguel Casas, R. Alpoim. 2014. Protocols of the EU bottom trawl survey of Flemish Cap. NAFO Scientific Council Studies, 46: 1–42. doi:10.2960/S.v46.m1 |
| 1. Graphical representation (map) showing the positions (locations) of the realized samples.     Figure 1G.6.2 - Flemish Cap 2021: Trawl sets (right panel); CTD sets (left panel)   1. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.  * Portuguese-Spanish surveys in Flemish Cap - coordination meeting for the survey (<http://www.repositorio.ieo.es/e-ieo/handle/10508/15670>).  1. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).  * Biomass and abundance (length and age distributions) indices for stock assessments, of cod, American plaice, redfishes (*Sebastes spp*.), Greenland halibut, grenadiers, skates and shrimp. Data provided to NAFO Scientific Council; * Environmental and ecosystem indicators, also provided to NAFO Scientific Council; * Management advice.   9. Extended comments (Tables 1G and 1H)  In 2021, due to the situation of Covid-19 and the existing difficulties to cross the Canadian border, the ship left and returned to Vigo. |

TB 1G.6 – ARQDAÇO Survey

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| General comment: This box fulfills Chapter I of the Annex of the Implementing Decision (EU) 2019/909, on the list of mandatory surveys and thresholds, of the multiannual Union programme; and Article 2 and Article 7 paragraph (3) of the Decision (EU) 2016/1701 on the format of the WP. It is intended to specify which reseach surveys at sea set out in the multiannual Union programme will be carried out. Member States shall specify whether the research survey is included in Chapter I of the Annex of the implementing decision of the multiannual Union programme or whether it is an additional survey. |
| General comment: This box is applicable to the Annual Report. This box should provide complementary information on the performance of the surveys, the results and their main use. |
| 7.1 Objectives of the survey  The annual spring bottom longline survey - ARQDAÇO - was established since 1995, targeting demersal and deep water species up to 1200 m depth in the areas near all the nine islands of the archipelago, and various seamounts in the Azores Exclusive Economic Zone. The main aim of the monitoring surveys is to monitor the abundances of the main demersal fishes in Azores, but several campaigns have also explored areas still poorly known in the region, mostly for prospecting purposes, adding to the knowledge on regional environment and species. The applicability of the collected data is related to the support and advice to fishery policy makers, to contribute to the compilation of assessment reports by several working groups, such as the ICES (International Council for the Exploration of the Sea), or regional and national assessments under the framework of the Marine Strategy Framework Directive.  7.2 Description of the methods used in the survey  The ARQDAÇO surveys follow a standardized methodology, using a bottom longline gear similar to that mostly used by the local demersal fishing fleet. Each year, around 34 fishing sets are deployed (Fig 1G.7.1). Data, collected during the surveys, include data on fishing effort and catches by species. On a subsample of fish, biological variables (length, weight, sex, gonadal maturation stage) and samples (otoliths, for age estimation; portions of muscle, for genetic analyses; other tissue for different studies) are collected. During the surveys, a large amount of fishes (mainly *Pagellus bogaraveo* and *Helicolenus dactylopterus*) are tagged with traditional spaghetti tags and released. Tagging activity is expected to contribute to the knowledge of the species movements and connectivity among fishing grounds, abundance estimates, mortality and growth rates. Organisms collected as by-catch (such as corals, and other invertebrates) are preserved for further identification and studies. Additionally, oceanographic data are collected using CTDs in half of the fishing sets deployed (i.e. 17 stations; Fig 1G.7.2).  C:\Users\angela\AppData\Local\Microsoft\Windows\INetCache\Content.Word\Demersais2013_L.JPG  Figure 1G.7.1 – Annual spring bottom longline survey - ARQDAÇO - fishing sets location.  C:\Users\angela\AppData\Local\Microsoft\Windows\INetCache\Content.Word\CTD arquipelago.jpg  Figure 1G.7.2 – Annual spring bottom longline survey - ARQDAÇO - CTD stations.  7.3 Description of the international task sharing (physical and/or financial) and the cost sharing agreement used  The surveys have been mainly funded by the Azores Regional Government, but also by national and European entities (i.e. EU-DGXIV, INTERREG).  (max. 450 words per survey) |
| 1. Graphical representation (map) showing the positions (locations) of the realized samples.   Spatial distribution of the 16 hauls conducted in sampling year during annual spring bottom longline survey “ARQDAÇO” is presented in figure 1G.7.3. Fishing set locations represent data collection of all types of sampling activities planned.    Figure 1G.7.3 – Annual spring bottom longline survey 2021 - ARQDAÇO - fishing sets location.   1. For internationally coordinated surveys, provide a link to the latest meeting report of the coordination group.   ARQDAÇO 2021 cruise report will be available soon at the website from Okeanos R&D Center from the University of the Azores: <http://www.okeanos.uac.pt/cruzeiros/>.   1. List the main use of the results of the survey (e.g. indices, abundance estimates, environmental indicators).   Main results of the survey are indices, abundance estimates, spatial and temporal distributions, catch per unit of effort (both in number and weight), relative population number, length and age composition (for all individuals and mature/immature individuals).  Data collected during the survey is assimilated on a routine base at international context during ICES working groups concerning stock assessment such as WGDEEP (Working Group on the Biology and Assessment of Deep-sea Fisheries Resources), WGEF (Working Group on Elasmobranch Fishes) and WGHANSA (Working Group on Southern Horse Mackerel, Anchovy and Sardine).  On a national context, data provide scientific advice to the Regional Government of the Azores, especially on fisheries management and conservation issues, as well as in regional and national assessments in the remit of the Marine Strategy Framework Directive and United Nations Sustainable Development Goals (Goal 14 – Conserve and sustainably use the oceans, seas and marine resources). Occurrences by species and sampling stations registered during surveys from 1996-2013 are part of a dataset available at EMODnet biology data portal that provides free access to data on temporal and spatial distribution of marine species.  9. Extended comments (Tables 1G and 1H)  The 2021 monitoring campaign for the abundance of demersal fish in the Azores archipelago did not go as planned, with only 16 of the 34 planned fishing hauls carried out. The failure to comply with the initial plan, which foresaw the sampling of the coast of the nine islands and the three emblematic fishing grounds of the Region, was due to a strike by the crew of the “N/I Arquipélago”. This unexpected situation lasted for most of the ship's time available for the annual demersal monitoring cruise. Thus, only the islands of the central group (Faial, Pico, São Jorge, Graciosa and Terceira) and the Azores bank were sampled. Acquisition of new CTD equipment is planned for the 2022 survey. All efforts are being made to solve the strike situation and the 2022 survey is expected to occur.  (max 450 words per survey) |

Section 2: Fishing Activity Data

Text Box 2A: Fishing activity variables data collection strategy

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| General comment: This box fulfills paragraph 4 of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 4 paragraph (2) point (b) and Article 5 paragraph (2) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to describe the method used to derive estimates on representative samples where data are not to be recorded under Regulation (EU) No 1224/2009 or where data collected under Regulation (EU) No 1224/2009 are not at the right aggregation level for the intended scientific use. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the data collection of fishing activity variables of Member States. |
| 1.Description of methodologies used to cross-validate the different sources of data.  For effort, the primary data source is logbooks data and the sales notes are the secondary data source. Frame population comprises all vessels with annual permit to operate.   * In order to improve the data harmonization between partners (Mainland, Azores and Madeira), a refined algorithm for fleet segmentation and metier definition was implemented, being each fishing trip assigned to a metier. The registered fishing trips were collected from different sources, and some issues have been identified (e.g.: trip duplication) that point to the need for further developing the algorithm. This task is foreseen to be accomplished in the short term, aiming for transmission on transversal, economic and biological variables at fleet segment or metier based. The algorithm and methodology will be made available to RCMs, following Recommendation 20 of LM: “Review current algorithms and processes for allocating a trip to a métier based on catch data, provide standard guidelines for it and define a strategy for storing and maintaining national fishery descriptions relative to the defined metiers.” * Regarding landings in national ports, Portuguese administration cross-checks all the information from VMS, logbooks and sales notes in order to filter wrong data (e.g.: trip duration, location of fishing operation), complying with the cross-checks foreseen under the control legislation. The cross-check between landed species (name and weight) and the ones declared in the logbooks is performed on a daily basis. * As far as landings in other MS harbours are concerned, Portugal cross-checks landings data recorded in the logbooks’ landing declaration with the landings reported to the Commission by each of those MS, via catch reports. In case of landings or transshipments in third country ports, where sales notes are not available, the cross-checking is made between logbooks’ landings, and using VMS data to identify the area of fishing operation. When transhipment takes place, the catch volume by species is computed from T2M documentation.   2. Description of methodologies used to estimate the value of landings.  In Portugal, all vessels landing fresh fish are obliged to sell in first sale. Therefore, data regarding all vessels landing in national ports, including small scale fisheries, are census-like.  The sources of information on landings of fresh or refrigerated fish in national ports are the national designated authorities for that purpose, DOCAPESCA SA and LOTAÇOR E.P., for mainland ports and Azores ports, respectively, and the Regional Directorate DRPM, for Madeira ports.  These entities electronically register all the data from 1st sale, and then send the information to the national administration, accordingly to the rules laid out in the Control regulation.  Regarding fish processed on board, the sources for landing data are logbooks and landing declarations. Landings’ live weight by species is computed using processed-live weight conversion factors.  3. Description of methodologies used to estimate the average price (it is recommended to use weighted averages, trip by trip)  Like it was already referred above, all vessels are obliged to sell the landed fish in the auction places, then data regarding prices are census-like.  4. Description of methodologies used to plan collection of the complementary data (sample plan methodology, type of data collected, frequency of collection etc)  For Azores Region a complementary data collection is run with the aim of completing the information for effort variables with a sampling coverage of 5% of the fishing trips.  Regional Directorate for Fisheries in Azores(DRP/RAA) is in charge of information collection concerning the fishing effort, from all harbours where technicians/samplers are located. The information to be collected on effort refers to: days at sea, fishing days, number of fishing trips, number of fishing gears, number of fishing operations, number and size of nets, number of hooks and lines and number of traps.  The main sources of information for gathering these transversal variables are logbooks and inquiries to boat owners present in the harbours at unloading time. These inquiries include all fleet segments, but with increased effort on those that are not obliged to fill a logbook (< 10 meters). For the small scale fleet (boats under 10 meters), questionnaires are distributed by fishermen based on a panel survey methodology, with the purpose of collecting more information of this fleet segment.  (max 900 words per Region) |
| 5. Deviations from Work Plan methodology used to cross-validate the different sources of data  No deviations to report.  Actions to avoid deviations.  Not applicable  6. Deviations from Work Plan methodology used to estimate the value of landings.  No deviations to report.  Actions to avoid deviations  Not applicable  7. Deviations from Work Plan methodology used to estimate the average price.  No deviations to report.  Actions to avoid deviations.  Not applicable  8. Deviations from Work Plan methodology used to plan collection of the complementary data  No deviations to report.  Actions to avoid deviations  Not applicable |

Section 3: Economic and Social Data

Text Box 3A: Population segments for collection of economic and social data for fisheries

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| General comment: This box fulfils paragraph 5 points (a) and (b) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 4 paragraphs (1), (2) and (5) and Article 5 paragraph (2) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Tables 5(A) and 6 of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the fleet socio-economic data collection of Member States. |
| 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 available for all vessel owners. For social variables, the data will be 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, although it is census it is not possible to get answers from the whole universe. All of them are related to the same universe, i.e. the fleet registered on the 31th December of the reference year, therefore the matching of sources is assured. The sources and methods for each variable are listed in Table 3A.  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  Economic and social data collection is done by census.  In order to comply with new demands and to obtain more accurate estimates, Portugal established a uniform fishing fleet segmentation between economic and biological data, based on metier 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.  4. Description of methodologies used for estimation procedures  To deal with non-responses, 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).  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 (fleet register).  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 (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 2011were:  - 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.  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.  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 year 2019 is the first year of census economic data collection. MS will evaluate the best methodology to be used to ensure the data quality level required by DCF.  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.  (max 900 words per Region) |
| 6. Deviations from Work Plan methodology for selection of data source  No deviations.  Actions to avoid deviations  Not applicable.  7. Deviations from Work Plan methodology to choose type of data collection  No deviations.  Actions to avoid deviations  Not applicable.  8. Deviations from Work Plan methodology regarding sampling frame and allocation scheme  No deviations.  Actions to avoid deviations  Not applicable.  9. Deviations from Work Plan methodology used for estimation procedures  No deviations.  Actions to avoid deviations  Not applicable.  10. Quality assurance  10.1 Sound methodology  The survey is now available, on line, to all vessel owners. An effort was made to contact owners and associations asking for responses and also to correct detected outliers in submmited questionnaires in the case of wrong response.  The methodologies applied are inline with expert group recommendations. And are documented and made publicly available in the National WP, which is available in [DGRM- PNRD](https://www.dgrm.mm.gov.pt/web/guest/pnrd).  10.2. Accuracy and reliability  Response rate and Achieved sample rate are provided in Table 3A.  The enquiry system has been built with data validation criteria in order to prevent the entry of misleading data. Some manual verification has been done by the technicians and vessel owners were contacted to assure honesty and correct any human mistake  10.3. Accessibility and Clarity  Are methodological documents publicly available? Yes  Are data stored in databases? Yes  Where can methodological and other documentation be found?  Methodological and other documentation can be found at [DGRM-PNRD](https://www.dgrm.mm.gov.pt/web/guest/pnrd) |

Section 3: Economic and Social Data

Pilot Study 3: Data on employment by education level and nationality

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| General comment: This box fulfills paragraph 5 point (b) and paragraph 6 point (b) of Chapter III of the Annex Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2 and Article 4 paragraph (3) point (c) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Table 6 of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study (including deviations from planned and justifications as to why if this was not the case). |
| No pilot study will be applied for data collection on employment by education level and by nationality in 2017. This data will be collected under the aquaculture census operation conducted annually by DGRM.  (max 900 words) |
| 4. Achievement of the original expected outcomes of pilot study and justification if this was not the case.  NA  5. Incorporation of results from pilot study into regular sampling by the Member State.  NA |

Section 3: Economic and Social Data

Text Box 3B: Population segments for collection of economic and social data for aquaculture

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| General comment: This box fulfills paragraph 6 points (a) and (b) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Tables 6 and 7 of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the socio-economic data collection for aquaculture of Member States. |
| 1. Description of methodologies used to choose the different sources of data  As much as the aquaculture sector is concerned, Portuguese Fisheries Administration acts as the national authority for the production of statistical data. Ever since, all work undertaken within the aquaculture sector is related to the production of data under the European Statistical System.  2. Description of methodologies used to choose the different types of data collection  Following the publication of Regulation (EC) no. 788/1996, DGRM developed a statistical operation, together with the National Institute for Statistics, performed annually. The sample unit is the establishment and the population comprehends all those establishments that, at the reference year, had legal conditions to undertake any aquaculture activity.  The two operations that supports Aquaculture programme have different target population. The first one, administrative inquiry, has a population comprises by all the aquaculture establishments, regardless of being the first or second activity of the enterprise. The unit of observations is the establishment identified with aquaculture annual licence register.  For the second operation, the one supported by National Institute for Statistics, the unit of observation is the enterprise, and will be considered the enterprises with primary activity under NACE Code 03.02, as orientations laid down on Commission Decision.  Relation between both operations is assured by the National Registry of Aquaculture Units and Enterprises, where all the population of enterprises and units are stored, despite of nature of the aquaculture activity (primary or secondary).  As result of different levels of activity and also target population (hatchery and fish units, shellfish units), two kinds of questionnaires were developed, both as census-like operations.  The first one, more complete, is set to the universe of hatcheries and all fish farming units and the second questionnaire is developed to collect data on shellfish farming units.  3. Description of methodologies used to choose sampling frame and allocation scheme  Both supporting operations are census like operations, therefore not applicable.  4. Description of methodologies used for estimation procedures  Estimation process for primary variables is supported by estimators of total for census-like information.  To deal with non-responses, a problem mainly concerned with artisanal units for production of bivalve molluscs (clams), the developed methodology is based on the application of raising factors. Each year, based on the collected answers, the average yield (Y) of production, tonnes per hectare, is estimated. For all non respondents units, based on their farming area, and applying the annual yield, the total clam production for the reference year is estimated. For non-responses on other variables an inputation of the segment average value is made. This imputation is made only for variables where values are expected, for other variables a direct contact to the respondent is established in order to confirm the zero value instead of a non-response.  Employment variables, such as FTE will be estimated in accordance with Study Fish/2005/14.  5. Description of methodologies used on data quality  Data collected under the present methodology are subject to a series of validation procedures, in accordance with the rules already evaluated under the Methodological document produced to INE. Both sources are census operations and evaluation of the coverance rate is foreseen. Values by segment are plotted to identify extreme values. For some extreme values, corrections on the dimensions are made (kilos to tonnes and kilos to gramms), for other extreme values a direct contact to the respondent is established in order to confirm them.  *(max 1000 words)* |
| 6. Deviations from Work Plan methodology for selection of data source  No deviations.  Actions to avoid deviations  Not Applicable  7. Deviations from Work Plan methodology to choose type of data collection  Since 2018 the enquiry has only one model for all type of enterprises and the data is collected on-line via BMAR.  The administrative inquiry since 2017 social and economic data was done by company instead of production unit/establishment. The goal was to achieve a better data quality as some variables are difficult to be desegregated by establishment.  Actions to avoid deviations  The criteria referred above will be maintained in future inquiries.  8. Deviations from Work Plan methodology regarding sampling frame and allocation scheme  No deviations  Actions to avoid deviations  Not applicable  9. Deviations from Work Plan methodology used for estimation procedures  No deviations  Actions to avoid deviations  Not applicable  10. Quality assurance  10.1 Sound methodology  The data collection scheme is Census. The methodological document is public both in DGRM and INE web pages. The document was approved by the National Statistics Institute (INE).  10.2. Accuracy and reliability  Response rate and Achieved sample rate are provided in Table 3B.  With the implementation of a data warehouse, there will be an improvement in the processing of data, in order to ensure a higher quality of the data that is collected and validated.  Primary data are inserted in BMar the DGRM master database. During the year (data collection period) the Aquaculture Department is responsible to validate the survey that was submitted online in the database. Also during the data collection period, all major errors are checked in the received questionnaires (ex: units, missing data on production box) and when needed an e-mail or a telephone contact is done in order to clarify and to correct the information. In May, an intermediate evaluation is done only focused on the production. The information is imported for the “Statistics Schema” and some random tests are done for some variables and the percentage of responses per segment is transmitted to the Aquaculture Department in order to insist with missing responses.  Finally, when the data collection is finished, all the data is updated in the “Statistics Schema”. Estimation process for on-bottom/clam is done with the approved methodology of Portuguese NSI. The completeness and data coherence of all variables are analyzed based on SQL-scripts that are run directly in the database and every outsider is considered an error and sent to the Aquaculture Department for clarification.  For additional information, briefly describe how raw data inputs, intermediate results and outputs are regularly assessed and validated and how errors are identified, documented and dealt with.  10.3. Accessibility and Clarity  Indicate with Yes or No  Are methodological documents publicly available?  Yes  Are data stored in databases?  Yes  Where can methodological and other documentation be found?  Methodological and other documentation can be found a at [PNRD.](https://www.dgrm.mm.gov.pt/web/guest/pnrd)  (max 1000 words) |

Section 3: Economic and Social Data

Pilot Study 4: Environmental data on aquaculture

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| General comment: This box fulfills paragraph 6 point (c) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2 and Article 4 paragraph (3) point (d) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Table 8 of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box is intended to provide information on the results obtained from the implementation of the pilot study (including deviations from planned and justifications as to why if this was not the case). |
| No pilot study is needed for environmental data on portuguese aquaculture considering chapter V (6.). Actually, Portugal’s production represents 0,65% of the total Union aquaculture production in volume and 1,23% in value.  The threshold to be applied is 2,5% of the total Union aquaculture.   (source: Facts and Figures - 2016 EUROSTAT).   |  |  |  |  | | --- | --- | --- | --- | | **Total Aquaculture Production** | **EU-28** | **PT** | **%** | | **Volume  (tonnes)** | 1.211.259 | 7.874 | 0,65 | | **Value (1000 euro)** | 4.014.626 | 49.266 | 1,23 |   (max 900 words) |
| 4. Achievement of the original expected outcomes of pilot study and justification if this was not the case.  NA  5. Incorporation of results from pilot study into regular sampling by the Member State.  NA |

Section 3: Economic and Social Data

Text Box 3C: Population segments for collection of economic and social data for the processing industry

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| General comment: This box fulfils footnote 6 of paragraph 1.1(d) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme; and Article 2, Article 4 paragraphs (1) and (5) and Article 5 paragraph (2) of the Implementing Decision (EU) 2016/1701 on the format of the WP. It is intended to specify data to be collected under Table 10 of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the implementation of the socio-economic data collection for aquaculture of Member States. |
| Considering that under Chapter III, 1.1 (d) of Commission Implementing Decision (EU) 2016/1251 of 12 July, social and economic data on the processing industry may be collected on a voluntary basis, Portugal did not include those sets in the Work Plan.  (max 1000 words) |
| 6. Deviations from Work Plan methodology for selection of data source  NA  7. Deviations from Work Plan methodology to choose type of data collection  NA  8. Deviations from Work Plan methodology regarding sampling frame and allocation scheme  NA  9. Deviations from Work Plan methodology used for estimation procedures  NA  10. Quality assurance  10.1 Sound methodology  NA  10.2. Accuracy and reliability  NA  10.3. Accessibility and Clarity  Indicate with Yes or No:  Are methodological documents publicly available?  Are data stored in databases?  Where can methodological and other documentation be found?  Provide the web link, if documentation is publicly available.  NA |

# Section 4: Sampling Strategy for Biological Data from Commercial Fisheries

Text Box 4A: Sampling plan description for biological data

Text Box 4A.1: Region NAFO (FAO area 21) - RFMO/RFO/IO NAFO - Sub-area / Fishing ground NAFO 3LMNO; Region Eastern Artic (ICES areas I and II) - RFMO/RFO/IO ICES - Sub-area / Fishing ground ICES areas I and II

**TB 4A.1 At-sea sampling**

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| General comment: This box fulfills Article 3, Article 4 paragraph (4) and Article 8 of the Implementing Decision (EU) 2016/1701 on the format of the WP and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the deviations from the planned sampling of Member States. |
| 1. Description of the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701 on the format of the WP.  **At-sea sampling:**  **NAFO 3LMNO (PTS30 - OTB\_DEF in Table 4A);**  **ICES I, II (PTS28 - OTB\_DEF and PTS29 - OTM\_SPF in Table 4A)**  **1.Specification of purposes**  The objective of the at-sea sampling is to obtain catch (unsorted catches) composition, volume,  positions, effort, lengths and biological parameters of Portuguese vessels operating in NAFO Subarea 3 and ICES Divisions I, II.  **2.Design**  Population:  Portuguese vessels operating in NAFO Subarea 3 and ICES Divisions I, II.  Target population:  Active vessels fishing in the area with logistical conditions (crew space/slot) for carrying out scientific sampling on board.  Sampling frame: Cooperative vessels.  Stratification type: Spatial (by Division).  Sampling effort: Sampling effort is dependent both on companies/skippers cooperation and availability of a nurseman within the crew.  Primary Sampling Unit (PSU): Trip.  Description:  Vessels selection is quasi-random from within 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.  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.  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.  **3.Expected execution difficulties**  Fishing strategy of cooperative companies is highly variable and dependent of unpredicted market opportunities. This may partly jeopardize the yearly sampling design in one or both regulatory areas.  **4.Data archiving and Quality assurance procedure**  The Eastern Artic - ICES - ICES I, II data are stored in a local data base and upload in the international data bases FishFrame and Intercatch. NAFO (FAO area 21) - NAFO Sub-area 3LMNO data are stored in a local data base and submitted to quality check to meet NAFO requirements, and are further validated by NAFO.  **5.Analysis methods**  Estimates at fleet level have been provided to NAFO and the relevant ICES working groups.  References  Vargas, J.; Alpoim, R.; Santos, E. e Ávila de Melo, A. M. (2016) – NAFO Portuguese Research Report for 2015. NAFO SCS Doc. 16/09, Serial N6555, 45 pp.  *(max 900 words per region)* |
| Deviation from the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701:  **2. Deviations from the Work Plan**  2.1) NAFO 3LMNO (PTS30 - OTB\_DEF in Table 4A)  - No deviations from the Work Plan.  2.2) ICES I, II (PTS28 - OTB\_DEF and PTS29 - OTM\_SPF in Table 4A)  - In 2021, 1 single trip sampled in ICES I,II but the trip included the two metiers: the first part of the trip was directed at the metier "OTM\_SPF" (Scheme “PTS29 - OTM\_SPF") and the second part at "OTB\_DEF" (Scheme “PTS28 - OTB\_DEF").  - Work plan refers to Scheme “PTS29 - OTM\_SPF” but should refer to Scheme “PTS29 - OTM\_DEF”.  **3. Action to avoid deviations**  2.1) and 2.2) No actions needed. |

Text Box 4A.2: Region Southern Western waters (ICES zones VIII, IX) - RFMO/RFO/IO ICES - Sub-area / Fishing ground IXa and IXa (Functional Units 28, 29)

TB 4A.2 At-market (Concurrent sampling), At-market (Species focus - Size category) and at-sea sampling

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| General comment: This box fulfills Article 3, Article 4 paragraph (4) and Article 8 of the Implementing Decision (EU) 2016/1701 on the format of the WP and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the deviations from the planned sampling of Member States. |
| 1. Description of the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701 on the format of the WP.  **At-market sampling (Concurrent sampling) (Mainland - IXa): PTM1-FPO\_MOL; PTM5-GNS\_GTR\_DEF; PTM7-LLS\_DEF; PTM11-LLS\_DWS; PTM14-OTB\_DEF; PTM17-OTB\_CRU** (IXa (Functional Units 28, 29))**; PTM20-PS\_SPF; PTM22-TBB\_MCD (in Table 4A)**  **1.Specification of purposes**  The objective of at-market sampling is to obtain length distributions of fish landed at auctions by Portuguese vessels operating in ICES Division IXa.  **2.Design**  Population:  Lengths of fish landed by Portuguese vessels operating in ICES Division IXa.  Target population: Lengths of fish landed at auction (= port) by Portuguese vessels licensed to operate in ICES Division IXa.  Study population: Lengths of fish at port from a subset of vessels from a fleet segment, based on a combination of gear licences and the main species landed in previous year.  Sampling frame: List of ports\*day for each fleet segment(\*).  Stratification type: Spatial – ports; Temporal – quarters. Stratification is used to improve sampling coverage through the year and in the Portuguese coast.  Sampling effort: Fixed by previous allocation where a weight/value criteria is used. Spatio-temporal allocation is proportional to landings (from previous year) in each port\*quarter combination.  Primary Sampling Unit (PSU): Auction\*day.  Description:  a) 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 auction\*days to be sampled in each fleet (≈ métier). Sampling effort is allocated to auctions and quarters proportionally to last year’s landings.  b) 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.  c) 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. Eachvessel\_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.  d) In each vessel\_sale\_event, the observers aim to sample boxes from every commercial species and commercial category.  e) 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.  f) When different species are present within a box, observers sample them all.  During 2020, 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.  **3.Expected execution difficulties**  a) Vessels arriving to port after the auction has started, with large amounts of landings/species/categories meaning no time to sample the complete trip. (e.g.: OTB\_DEF).  b) Shipmasters not giving permission for observers to sample fish from their vessels.  c) 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.  **4.Data archiving and Quality assurance procedure**  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.  **5.Analysis methods**  Most of the stocks are assessed within ICES Assessment Working Groups. Data preparation and stock assessment methods are defined in benchmarking processes and described in the species “stock annex”.  References  ICES. 2015. Report of the workshop on developing the RDB data format for design based sampling and estimation (WKRDB 2014-1), 27-31 October 2014, Aberdeen, Scotland, United-Kingdom. ICES CM 2014\ACOM:68. 98 pp  (\*) There are 9 mutually exclusive vessel lists (based on fishing licenses and previous catch) that approximate the métiers selected for sampling at DCF level.  **At-market sampling (Species focus – Size category) (Mainland - IXa): PTM9 – SF\_SC (in Table 4A)**  **1.Specification of purposes**  The objective of at-market sampling (Species focus – Size category)is to obtain length distributions of fish landed at auctions by Portuguese vessels operating in ICES Division IXa. This sampling strategy is currently applied to horse mackerel, *Trachurus trachurus*, following a pilot-study run in 2017 in parallel to the concurrent sampling. This sampling strategy may be extended to other species with high landings and economically important in Portugal. Since the implementation of this sampling scheme, this species is no longer sampled under concurrent sampling at-market.  **2.Design**  Population:  Lengths of fish (*Trachurus trachurus*) landed by Portuguese vessels operating in ICES Division IXa.  Target population: Lengths of fish (*Trachurus trachurus*) landed at auction (= port) by Portuguese vessels licensed to operate in ICES Division IXa.  Study population: Lengths of fish at port.  Sampling frame: List of ports\*day.  Stratification type: Spatial – ports; Temporal – quarters. Stratification is used to improve sampling coverage through the year and in the Portuguese coast.  Sampling effort: Fixed by previous allocation where a weight criteria is used. Spatio-temporal allocation is proportional to landings in each port\*quarter combination.  Primary Sampling Unit (PSU): Auction\*day.  Secondary Sampling Unit (SSU): Commercial size category  Description:  a) Annual sampling effort is fixed by the DCF National Sampling Plan that sets number of auction\*days to be sampled. Sampling effort is allocated to auctions and quarters proportionally to landings in previous reference years.   b) For each auction, 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.  c) In every auction\*visit\_date, observers attempt to sample every commercial size category of *Trachurus trachurus*, by haphazardly selecting 1 box from each commercial size category, 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.  d) Within each box, the observers haphazardly select a predefined number of individuals which are sampled for all biological variables (length, weight, age, sex ratio, sexual maturity).  **3.Expected execution difficulties**  a) Shipmasters not giving permission for observers to sample fish from their vessels.  **4.Data archiving and Quality assurance procedure**  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.  **5.Analysis methods**  *Trachurus trachurus* is assessed within the ICES Assessment Working Group WGHANSA. Data preparation and stock assessment methods are defined in benchmarking processes and described in the species “stock annex”.  References  Azevedo M, Silva C, Volstad JH. 2016. Modelling length distribution by commercial size category to estimate species catch length composition for stock assessment. ICES CM 2016/O  **At-sea sampling (Mainland - IXa): PTS3-GNS\_GTR\_DEF; PTS9-LLS\_DWS; PTS12-OTB\_DEF; PTS15-OTB\_CRU; PTS18-PS\_SPF; TBB\_MCD (in Table 4A)**  **1.Specification of purposes**  The objective of at-sea sampling is to obtain catch (discards + landings) composition, volume, lengths and age of fish captured by Portuguese vessels operating in ICES Division IXa.  **2.Design**  Population: Lengths of fish captured by the Portuguese vessels operating in ICES Division IXa (within  species).  Target population: Lengths of fish captured by the Portuguese vessels > 12m that operate in ICES Division IXa (within species).  Study population: Lengths of fish captured by a subset of Portuguese vessels > 18m that operate in ICES Division IXa (within species). The subset is composed of several fleet segments selected based on species landings. The subset does not encompass the full target population (i.e., some fleet segments are not sampled).  Sampling frame: List of cooperative vessels for each fleet segment/métier.  Stratification type: Spatial – ports (Northwest, Southwest and South); Temporal – quarters.  Sampling effort: Sampling effort defined at a trip basis, where the number of trips to sample OTB\_CRU and OTB\_DEF was obtained from a Neyman allocation which is considered valid for the entire DCF period (OTB\_CRU: 12 trips and OTB\_DEF: 27 trips). For the other metiers, the sampling effort established was at least one per month (LLS\_DWS, TBB\_MCD: 12 trips each) and 2 per month (GNS\_GTR, PS\_SPF: 24 trips). Within each métier, sampling effort distribution in space and time is proportional to effort or landings.  Primary Sampling Unit (PSU): Trip.  Description:  Vessels selection for trip sampling is quasi-random from within 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 to 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) (Prista *et al.*, 2012; Jardim *et al.* 2012, Feijó *et al*, 2012).  **3.Expected execution difficulties**  a) For some fleets (GNS\_GTR) there are a large number of smaller vessels that cannot take observers onboard.  b) Increased refusal rate for on-board observers from TBB\_MCD vessels.  c) 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 metier basis.  d) Logistic difficulties in transportation of observers to certain ports.  **4.Data archiving & Quality assurance procedure**  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.  **5.Analysis methods**  Estimates at fleet level have only been provided for OTB\_CRU and OTB\_DEF, where vessel lists and fishing behaviour have proven fairly consistent through time, and where sampling dates back to 2004. In other métiers, sampling and estimation have proven more difficult and have not yet been reported. This is particularly the case of GNS\_ GTR (sampling dating back to 2009), and reasons for that are referred in “Expected execution difficulties”.  References  Prista, N.; Jardim, E.; Fernandes, A.C.; Silva, D.; Ferreira, A. L.; Abreu, P.; Fernandes, P., 2012. Manual de procedimentos a bordo: artes fundeadas.***Relat. Cient. Téc. Inst. Invest. Pescas Mar*, nº 56,** 23 p. + Anexos.  Jardim, E.; Prista, N.; Fernandes, A.C.; Silva, D.; Ferreira, A. L.; Abreu, P.; Fernandes, P., 2012. Manual de procedimentos a bordo: arrasto de fundo com portas.***Relat. Cient. Téc. Inst. Invest. Pescas Mar*, nº 55,** 20 p. + Anexos  Feijó, D.; Marçalo, A.; Wise, L.; Silva, A., 2012. Protocolo de Amostragem a Bordo da Pescado Cerco. ***Relat. Cient. Téc. IPIMAR*, *Série digital* (**[**http://inrb.pt/ipimar**](http://inrb.pt/ipimar)**) nº 57,** 11 p + X Anexos.  *(max 900 words per region)* |
| Deviation from the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701:  2. Deviations from the Work Plan  a) According to planned, apart from the following exceptions:  a.1) In the Schemes / Stratum ID codes listed below, the number of sampled PSU was higher than planned since, at a given “auction x day”, while observers are waiting to sample several schemes, time is used to sample other schemes with no additional cost:  “Longline for demersal fish: At-market” / “PTM7 - LLS\_DEF (main ports)”  “Purse seiners for sardine and other small pelagic fish: At-market” / “PTM20 - PS\_SPF”  a.2) In the Scheme / Stratum ID code “Longline for black scabbardfish: At-market / PTM11 - LLS\_DWS (1port)” the number of sampled PSU was higher than planned to increase the effective sample size to provide data to WGDEEP. No additional cost since sampling was done on the same "auction x day" as other schemes while observers are waiting to sample several schemes.  b) According to planned, apart from the following exceptions:  b.1) In the Scheme / Stratum ID codes listed below the number of sampled PSU was lower than planned: This limitation was mostly due to logistical issues especially concerning the travel of scientific observers to the ports.  “Species focus - Size category: At market” / “PTM9 - SF\_SC (main ports)”  “Trawlers for crustaceans: At-market” / “PTM17 - OTB\_CRU (1 port)”  b.2) In the Scheme / Stratum ID codes listed below the number of achieved PSU was lower than planned since onboard sampling in ICES IXa could not be done due to the COVID19 pandemic, with the exception of a few sampling trips (in Q4):  “Gill and trammel nets for demersal fish: At-sea” / “PTS3 - GNS\_GTR\_DEF (vessel length > 12m)”  “Longline for black scabbardfish: At-sea” / “PTS9 - LLS\_DWS (vessel length >12m)”  “Trawlers for demersal fish: At-sea” / “PTS12 - OTB\_DEF (vessel length > 24m)”  “Trawlers for crustaceans: At-sea” / “PTS15 - OTB\_CRU (vessel length > 12m)”  “Purse seiners for sardine and other small pelagic fish: At-sea” / “PTS18 - PS\_SPF (vessel length > 12m)”  “Beam trawl for shrimps: At-sea” / “PTS21 - TBB\_MCD”  c) In the Schemes for Sampling at-sea and at-market, the “Average Number of PSU during the reference years” may differ from the “Total number of PSU in the sampling year” due to the yearly dynamics of the fishing fleets, and to differences in the fleet segmentation methodology between the Work Plan and the Annual Report. Differences in fleet segmentation methodology can also account for some inconsistencies between "Number of unique vessels with activity in the stratum" and " Number of unique vessels sampled".  3. Action to avoid deviations  a.1) and a.2) For some sampling schemes at-market the number of sampled PSU was higher than planned (auction x day). But in these cases we achieved the number of sampled trips (SSU - secondary sampling unit) envisaged. The minimum planned number of auction days to be sampled will be reevaluated and adjusted if needed. It is expected that the outcome of ICES WKBIOPTIM in which we are involved will provide guidance on the optimization of sampling effort and intensity.  b.1) This issue continues to receive attention in 2022 and efforts are being made to ensure the travel of scientific observers to fishing ports for at-market sampling activities.  In parallel with the data collection at-market by scientific observers, in 2019-2020 a pilot experiment was implemented in 3 Portuguese auctions of 27.9.a (Aveiro, Sesimbra, Portimão) using FishMetrics system of automatic/remote image acquisition of landing boxes during sales; and in 2022-2024 a new pilot experiment will be implemented in Aveiro using the same system but aiming at further advancing the system especially by developing automated species identification and individual measurements through artificial intelligence.  b.2) Deviations in onboard sampling due to COVID-19 pandemic are not expected to continue to occur in 2022. Additional measures are being taken to increase safety of scientific observers.  c) There is an ongoing effort to improve fleet segmentation methodologies (e.g. we were involved in DCF Metier Workshop: Sub-group of the RCGs NANSEA- North Atlantic and North Sea and Eastern Arctic; and we are involved in the Intersessional workgroup of the RCGs dedicated to this issue). |

Text Box 4A.3: Region Southern Western waters (waters around Azores - RFMO/RFO/IO ICES - Sub-area / Fishing ground ICES X (waters around Azores)

TB 4A.3 At market and at sea sampling

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| General comment: This box fulfills Article 3, Article 4 paragraph (4) and Article 8 of the Implementing Decision (EU) 2016/1701 on the format of the WP and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the deviations from the planned sampling of Member States. |
| 1. Description of the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701 on the format of the WP.  **At market sampling (Azores - ICES X (waters around Azores)): AZM1 - LHP\_FIF; AZM14 – LHP\_CEP; AZM18 – PS\_SPF; AZM22 – GNS\_FIF; AZM27 – FPO; AZM43 - LLS\_DWS \_<12m; AZM45 - LLS\_DWS\_>18m; AZM51 - GRAPP (in Table 4A)**  **1.Specification of purposes**  The objective of at market sampling is to obtain length frequency distributions of fish landed at auctions by Azorean vessels operating in ICES Division X.  **2.Design**  Population: lengths of fish landed by Azorean vessels operating in ICES Division X;  Target population: lengths of fish landed at auction (=port) by the Azorean vessels licensed to operate in ICES Division X;  Study population: lengths of fish at port from a subset of vessels from a fleet segment/métier based on the result from the analysis through the algorithm developed and runned for previous year landings;  Sampling frame: vessels (using the different fishing techniques) operating from the main Azorean ports;  Stratification type: spatially (ports) and temporally (quarters) in order to improve sampling coverage through the year and in the main Azorean ports;  Sampling effort: in each fleet segment/métier sampling effort is fixed by previous allocation where a weight criteria is used. Spatio-temporal allocation is proportional to landings (from previous year) in each port\*quarter combination;  Primary Sampling Unit (PSU): port x day.  Description  The sampling design is stratified multistage:  a) The Azorean fleet is stratified by fleet segment, métier and time. Sampling effort is established as number of trips expected to be sampled in each fleet (≈métier) and allocated to auctions and quarters proportionally to last year’s landings;  b) In every auction\*visit\_date, samplers attempt to sample a predefined number of vessel\_sale\_events. Each vessel\_sale\_event corresponds to the landings of one fishing trip. Samplers randomly select the vessel\_sale\_events from vessels present at the harbor;  c) In each vessel\_sale\_event, the samplers aim to sample boxes from every commercial species and commercial category. This way, concurrent sampling scheme is applied, although sometimes the coverage of all species is not possible.  d) Within each commercial category samplers randomly select boxes to be sampled aiming for a minimum number of 50 fishes;  e) A fishing effort related questionnaire is also performed to the shipmaster of the vessel selected for sampling.  f) Refusal rates are recorded.  During the sampling period covered, fish length measurements will also be recorded in three 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.  **3.Expected execution difficulties**  a) Vessels arriving to port after the auction has started. If there is a large amount of landings/species/categories, there is no time to sample the complete trip;  b) Shipmasters don ́t give permission for samplers to measure fish from their vessels;  c) Previously fixed sale contracts for some species, prevents samplers access to fish.  d) In most situations, sampling is performed before weighing, which results in a constraint that at the time of landing, samplers have no way of classifying the trip as having been targeting deep-sea species. In order to ensure compliance with Article 5 (2) of Regulation (EU) 2016/2336, the trip classification from handliners and bottom longliners targeting deep water species (or finfish/demersal) is performed after sampling.  **4.Data archiving and Quality assurance procedure**  At market sampling database will be transferred from Excel files into a database to be constructed during the sampling period covered. This is expected to contain internal routines for both basic errors detection (e.g., errors in dates, species codes) as well as implementation of checking of errors.  Quality checks and validation procedures are implemented: (1) All samples are checked by a coordinator before the input of data; (2) All data introduced in database is checked for syntax errors; (3) A random check of 10% of the data is executed by inspecting the registered data for logical errors; (4) Length distribution and effort samples are then connected with the market landings for future cross examinations.  **5.Analysis methods**  Is dependent on stock coordinators needs, the purposes of the analysis or specific recommendations from RFMO’s.  **At sea sampling (Azores - ICES X (waters around Azores)): AZS4 - LHP\_FIF; AZS16 - LHP\_CEP; AZS20 - PS\_SPF; AZS23 - GNS\_FIF; AZS28 – FPO; AZS47 - LLS\_DWS \_<12m ; AZS49 - LLS\_DWS \_>12m (in Table 4A)**  **1.Specification of purposes**  The objective of the at sea sampling is to obtain all catch fractions specific composition (including discards), both in number and volume, lengths and age of Azorean vessels operating in ICES Division X.  **2.Design**  Population: lengths of fish captured by the Azorean vessels operating in ICES Division X (within species);  Target population: lengths of fish captured by the Azorean vessels of all length classes that operate in ICES Division X (within species), except for Handliners targeting tuna (pole and line);  Study population: lengths of fish captured by a subset of Azorean vessels within each length class/métier that operate in ICES Division X (within species). The subset is composed of several fleets segments selected based on species landings. The list of vessels for each fleet segment/métier is updated annually based on a combination of the results from the analysis through the algorithm developed and runned for previous year landings and a list of cooperative vessels;  Sampling frame: list of cooperative vessels >10m for each fleet segment/métier that are willing and have logistics conditions (space and safety equipment) to take observers onboard operating from the main Azorean ports;  Stratification type: métier, vessel length class, spatial (ports) and temporal (quarters);  Sampling effort: within each fleet segment/métier, sampling effort distribution in space and time is proportional to effort or landings;  Primary Sampling Unit (PSU): trip.  Description:  Vessels selection is quasi-random from a set of cooperative vessels within each fleet length class/métier. For 2020, the following metiers and sampling effort (number of trips) objectives are set: LHP\_FIF (n=12 trips), LLS\_DWS (n=46 trips), LHP\_CEP (n=12 trips), PS\_SPF (n=12 trips), GNS\_FIF (n=12 trips) and FPO (n=12 trips).  At sea sampling for discards purposes (length distribution and volume) is conducted by scientific observers accommodated voluntarily on board selected vessels (by métier and length class).  The Azores at sea observer scheme collects comprehensive data on species composition (including incidental by-catch), and length composition of all retained and discarded components of the catch on a haul-by-haul basis. 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. Landings from vessels with an observer on board will be sampled by the samplers present at the landing port. Non-responses and refusal rates are recorded.  **3.Expected execution difficulties**  Problems will occur regarding the access of the scientific observers on board fishing vessels that, either do not present the necessary conditions to take one extra person or refuse to accept them. Sampling targets depends critically on the goodwill of the fishing industry to at sea sampling. Main difficulties will occur at the level of smaller vessels that cannot take observers on board. Increased refusal rates and last minute boarding issues. At the time of boarding, observers have no way of classifying the trip as targeting deep-sea species. In order to ensure compliance with Article 5 (2) of Regulation (EU) 2016/2336, trip classification from handliners and bottom longliners targeting deep water species (or finfish/demersal) is performed after sampling.  **4.Data archiving & Quality assurance procedure**  At sea sampling database will be transferred from Excel files into a database to be constructed during the sampling period covered. This is expected to contain internal routines for both basic errors detection (e.g., errors in dates, species codes) as well as implementation of checking of errors.  Quality checks and validation procedures are implemented: (1) All samples are checked by a coordinator before the input of data; (2) All data introduced in database is checked for syntax errors; (3) A random check of 10% of the data is executed by inspecting the registered data for logical errors; (4) Length distribution and effort samples are then connected with the market landings for future cross examinations.  **5.Analysis methods**  Estimates at fleet level have only been provided for LLS\_DEF where sampling dates back to 2004.  *(max 900 words per region)* |
| Deviation from the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701:  **2. Deviations from the Work Plan**  2.1 At-market sampling  At-market sampling Schemes / Stratum ID codes listed below were undersampled due to pandemic situation caused by Sars-Cov-2 that, because of an imposed confinement, limited access to ports in São Miguel Island where major Azorean ports are located. Additionally, terrible weather conditions that occurred in the Azores region also led to a decrease in the number of samples collected:   * Hand lines for finfish at market / AZM1 - LHP\_FIF * Cephalopods at market / AZM14 - LHP\_CEP * Small Pelagic at Market / AZM18 - PS\_SPF   A new at-market sampling scheme was added in WP2021 amended (submitted by 30th October 2020) which has the special designation of “Grappling Patellidae - at market”. Main sampling intensity was assigned to a port (Flores) that never had a sampler technician before and, for this reason, refusal rates were observed reflecting low achievement in sampling at Stratum ID code AZM51-GRAPP.  Additional sampling with no extra costs was achieved for “Longlines for deepwater species at market” / “AZM45 – LLS\_DWS\_>12m”, benefiting of the presence of observers in the landing port to accomplish the concurrent sampling of EU MAP obligations.  2.2 At-sea sampling  Oversampling occurred for three of the At-sea sampling Schemes / Stratum ID codes, namely AZS4 - LHP\_FIF, AZS20 - PS\_SPF and AZS23 - GNS\_FIF. This was due to some of the planned number of PSU (i.e. trip) per Scheme / Stratum ID code for 2020 being carried over to 2021 because of bad weather conditions in November and December 2020 (when procedures for sampling at sea resumed due to COVID-19), and so that observers would not be in breach of signed contracts. On account of the time window when this decision occurred, this situation isn´t provided in the WP 2020-21 revised for 2021 submitted by 30th October 2020. This situation did not lead to extra expenses.  **3. Action to avoid deviations**  3.1 At-market sampling  Apart from the first trimester, sampling on land has already returned to normal in the Azores’ Outermost Region, applying all the National Health Organization recommendations.  It is foreseen in WP2022-24 the continued presence of sampler in the port in question (Flores), which will certainly improve the approach to sampling. Sampling for limpets is also foreseen to occur in more landing ports in WP2022-24.  3.2 At-sea sampling  No action planned. |

Text Box 4A.4: Region Southern Western waters (waters around Madeira) - RFMO/RFO/IO CECAF- Sub-area / Fishing ground FAO 34.1.2

**TB 4A.4. At-market and at-sea sampling**

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| General comment: This box fulfills Article 3, Article 4 paragraph (4) and Article 8 of the Implementing Decision (EU) 2016/1701 on the format of the WP and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the deviations from the planned sampling of Member States. |
| 1. Description of the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701 on the format of the WP.  **At-market sampling (Madeira - FAO 34.1.2): DWF1\_ M1; SPF1\_ M2; MOL1\_ M4 (in Table 4A)**  **1.Specification of purposes**  The objective of at-market sampling is to obtain length distributions of fish landed at auctions by Madeiran vessels operating in FAO 34.1.2 and 34.2.0.  **2. Sampling Design**  Population: Lengths of fish landed by the Madeiran vessels operating in FAO 34.1.2 and 34.2.0 (Within species).  Target population: Lengths of fish landed at auction (= port) by the Madeiran vessels operating in FAO 34.1.2 and 34.2.0 (Within species).  Study population: Lengths of fish landed by a subset of the Madeiran active vessels which operate in FAO 34.1.2 and 34.2.0 (Within species). The subset is composed of several fleet segments selected based on species landings. The list of vessels for each fleet segment is updated annually based on a combination of gear licenses and the main species landed in the previous year.  Sampling frame: list of ports\*day for each fleet segment.  Stratification type: Spatial – ports; Temporal – months. Stratification is used to improve sampling coverage through the year and in Madeira island.  Sampling effort: Within each métier, sampling effort distribution in space and time is proportional to effort or landings in each port\*month combination.  Primary Sampling Unit (PSU): trip.  Description:  The sampling design is stratified multistage, with trip as the Primary Sampling Unit (PSU).  a) The Madeiran fleet is stratified by fleet segment/métier, trip and month. Following the DCF requirements [EU Commission Decision (2010/93/EU) and sampling effort is established as number of trips. Annual sampling effort is fixed by the DCF National Sampling Plan that sets the number of trips expected to be sampled in each fleet (≈ métier).  b) For each fleet segment/métier, the visit dates in each auction\*month are spread somewhat systematically throughout the month in a way that covers all week-days where the fleet is active.  c) 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 trip. To select the vessel\_sale\_events that are to be sampled, observers obtain a list of all landings awaiting auction. The list generally includes the name of each vessel and the commercial species, commercial category and weight of each of its boxes. A vessel\_sale\_event is selected haphazardly from the list.  d) In each vessel\_sale\_event, the observers aim to sample boxes from every commercial species and commercial category.  e) Within each commercial category, the observers select 1 box haphazardly. However, sometimes there are <100 fish from a scientific species inside the box, so observers take several boxes until they reach the required number.  f) Within each box, different species may be present, and observers select all of them to sample.  **3.Expected execution difficulties**  a) Vessels arriving to the port after the auction has started. If they have a large amount of landings/species/categories,  there is no time to sample the complete trips.  b) Shipmasters do not give permission for observers to sample fish from their vessels.  c) Sometimes observers do not have time to sample all commercial species, so they select the more important species.  **4.Data bases & Quality assurance procedure**  The database in EXCEL contains general trip information (vessel information, date, location, landed weight by species), along with sample information by species, namely weight, number of specimens and length composition.  Quality checks and validation procedures are implemented: (1) All samples are checked by a coordinator before the input of data (2) All data introduced in database is checked for errors and outliers; (3) A random check of 10% of the data is executed by inspecting the registered data for logical errors; (4) Length distribution and effort samples are then connected with the logbooks for future cross examinations.  **At-sea sampling (Madeira - FAO 34.1.2): DWF2\_ M1; SPF2\_ M2 (in Table 4A)**  **1.Objectives**  The main objectives of the” at-sea sampling programme” is to identify and characterize the catches fractions specific composition (including discards), both in number and volume and lengths and age, of Madeira registered vessels operating in FAO 34.1.2 and 34.2.0.  **2.Sampling Design**  Population: Lengths of fishes captured by the Madeiran vessels operating in FAO 34.1.2 and 34.2.0 (Within species).  Target population: Lengths of fish captured by the Madeiran vessels of all length classes that operate in FAO 34.1.2 and 34.2.0 (Within species).  Study population: Lengths of fish captured by a subset of the Madeiran active vessels within each length class that operate in FAO 34.1.2. and 34.2.0 (Within species). The subset is composed of several fleet segments selected based on species landings. The list of vessels for each fleet segment is updated annually based on a combination of gear licenses and the main species landed in the previous year.  Sampling frame: List of cooperative vessels for each fleet segment/métier that are willing and have logistics (space and conditions) to take observers onboard.  Stratification type: vessel length class, métier and spatial (fishing grounds).  Sampling effort: Within each métier, sampling effort distribution in space and time is proportional to effort or landings.  Primary Sampling Unit (PSU): Trip  Description:  Vessels selection is quasi-random within a set of cooperative vessels. Every year, the following métiers and sampling effort objectives are set: LLD\_DWF (n=30 trips), and PS\_SPF (n=60 trips). Within each métier, sampling effort distribution in space and time is proportional to effort or landings.  A pluriannual programme (2017-2019) will be implemented contracting an outsource service to implement the Madeira observers on board programme.  At-sea sampling is conducted by one scientific observer, accommodated voluntarily on board by the captain.  Every haul of a trip is selected for sampling and for each fishing operation data to be recorded includes: (i) type, and technical characteristics of the gear and fishing operations; (ii) geographical location of fishing sets; (iii) species composition of the total catch (retained and discarded), and landings (collected at the fish auction following the trip) in number and biomass; (iv) lengths of retained (subsample), discards (*census*) and landings (subsample); (v) sex for elasmobranchs and crustaceans; (vi) reason for discarding each individual; (vii) the condition when discarded (alive/dead) and (viii) destiny of the retained fraction of the catch that might not be landed.Interactions with vulnerable fauna (e.g. sea-birds, sea-turtles and marine mammals) are also recorded.  The Madeira at-sea observer programme will collect comprehensive data on species composition and length composition of all retained and discarded components on a haul-by-haul basis, and therefore provides Scheme 1 concurrent sampling of Group 1 – 3 species. Landings from vessels with an observer on board, in specific trips will be sampled by the sampling technicians present at the landing harbour.  The target population is the total number of fishing trips, of a given metier, in a given time period, in Madeira fishing grounds.  **3.Expected execution difficulties**  Problems will occur regarding the access of the scientific observers on board fishing vessels that, either do not present the necessary conditions to take one extra person or refuse to accept them. Sampling targets depends critically on the goodwill of the fishing industry to at-sea sampling. Main difficulties will occur at the level of smaller vessels that cannot take observers on board.  **4.Data bases & Quality assurance procedure**  The database in EXCEL contains general trip information (vessel information, date, location, haul number, retained weight by species), along with sample information by fraction (retained, discarded) and species, namely weight, number of specimens and length composition.  Quality checks and validation procedures are implemented: (1) All samples are checked by a coordinator before the input of data (2) All data introduced in database is checked for errors and outliers; (3) A random check of 10% of the data is executed by inspecting the registered data for logical errors; (4) Length distribution and effort samples are then connected with the market landings for future cross examinations.  **Biological variables sampling (Madeira - FAO 34.1.2)**  Biological variables sampling are performed (at the Madeira fisheries laboratory), to obtain stock related variables including biometry, age, sex-ratio and sexual maturity of fish landed and sold in auctions by the Madeiran registered vessels operating in the FAO 34.1.2 and 34.2.0 areas.  Sampling for biological variables is independent of at-market sampling. Commercial sampling for biological variables (length, weight, age, sex ratio and maturity) is performed monthly by purchasing fish samples from selected ports at Madeira. Fish from each sample are randomly selected per length class (5 individuals/2, 5 or 10cm length class, depending on the species).  Biological sampling follows standardized protocols depending on the species. Length-weight relationship, age-length-key and maturity ogive are estimated in time intervals indicated in Table 1B.  *(max 900 words per region)* |
| Deviation from the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701:  **2. Deviations from the Work Plan**  On shore sampling Schemes  The sampling Scheme Patellidae on-shore with the Stratum ID code MOL1\_M4 was undersampled during 2021 due to the reduction of 15% in number of trips (Primary Sampling Unit), when compared to the reference years, and also because the harvesting season ended two months earlier than expected. Additionally, there were notorious difficulties in providing a vehicle for the technicians to travel to the auction houses far from Funchal, were the majority of the landings of Patellidae occurs.  In the sampling Scheme Small Pelagic species on-shore with the Stratum ID code SPF1\_M2 the number of sampled PSU was higher than planned benefiting from the implementation of a remote measurement system (FishMetrics) in the first quarter of 2021. The additional sampling of the biological variables occurred with no extra costs.  At-sea sampling Schemes  In the sampling Schemes Deep species at-sea (Stratum ID code DWF2\_M1) and Small Pelagic species at-sea (Stratum ID code SPF2\_M2) the number of achieved PSU was lower than planned since onboard sampling could not be done in the first quarter of 2021 due to COVID 19 pandemic. In addition, the establishment of an on board observer program was not possible due to failures in its implementation. Further, annual fishing trips suffered a reduction of 31% for DWF2\_M1 and 54% for SPF2\_M2 in relation to the reference period.  **3. Action to avoid deviations**  On shore sampling Schemes  To fill the sampling gap in the Scheme Patellidae on-shore (Stratum ID code MOL1\_M4), efforts are in place to solve the transport of technicians to ports far from Funchal, and it is expected to resume normality in the second semester of 2022. Furthermore, the remote digital measure system implemented in the auction houses will contribute to achieve the number of planned samples.  At-sea sampling Schemes  Deviations in sampling due to COVID-19 pandemic are not expected to continue to occur in 2022.  Efforts are in place to implement the on board observer program for the sampling Schemes Deep species at-sea (Stratum ID code DWF2\_M1) and Small Pelagic species at-sea (Stratum ID code SPF2\_M2) in order to achieve the number of PSU planned. In addition, significant efforts are in place to assure the acquisition of information through surveys at the fishing ports in order to mitigate the lack of information collected on board. |

Text Box 4A.5.: Region Other regions - RFMO/RFO/IO ICCAT - Sub-area / Fishing ground Atlantic Oceans and adjacent seas, BF58, Waters around Azores, Waters around Madeira

**TB 4A.5 At-market and at-sea sampling**

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| General comment: This box fulfills Article 3, Article 4 paragraph (4) and Article 8 of the Implementing Decision (EU) 2016/1701 on the format of the WP and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the deviations from the planned sampling of Member States. |
| 1. Description of the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701 on the format of the WP.  **At-market sampling (RFMO/RFO/IO** ICCAT**):**  **Mainland (Sub-area / Fishing ground** Atlantic Ocean and adjacent seas**, Sub-area / Fishing ground** BF58**);**  **Azores (Sub-area / Fishing ground** Waters around Azores grounds**);**  **Madeira (Sub-area / Fishing ground** Waters around Madeira**)**  At-market sampling in ICCAT is performed at Portugal mainland, Azores and Madeira ports. Sampling strategy used in each zone is described in table below:   |  |  |  |  |  | | --- | --- | --- | --- | --- | | At-market sampling | PT\_Mainland | | Azores | Madeira | | Stratum ID Code (Table 4A) | PTM25 - LLD\_LPF (longline) | PTM27 - FPN\_LPF (tuna traps) | AZM24 - LHP\_LPF \_<12m; AZM25 - LHP\_LPF \_>12m (poles and lines); AZM29 – LLD\_LPF (longline) | LPF1\_ M3 (poles and lines) | | **RFMO/RFO/IO** - **Sub-area / Fishing ground** | ICCAT - Atlantic Ocean and adjacent seas | ICCAT - BF58 | ICCAT – Waters around Azores | ICCAT – Waters around Madeira | | **1-Specification of purposes** | Obtain length distributions of fish landed at auctions | | | | | **2-Design** | | | | | | Population | Lengths of fish landed by Portuguese vessels in each zone/area | | | | | Target population | Lengths of fish landed at auction (=port) in each zone/area | | | | | Study population | Lengths of fish captured by Portuguese vessels operating in each zone/area and landed in selected ports for sampling | | | | | Sampling frame | All vessels landing in each selected port for sampling | | | | | Stratification type | None | Temporal (quarters) (\*) | Spatial (ports) and temporal (quarters) (\*) | None | | Sampling effort | All vessels landing in port are sampled | Fixed number of sampling days per quarter are defined proportionally to number of landing days per quarter | Fixed by previous allocation using a weight criteria. Spatio-temporal allocation proportional to landings in previous year in each port\*quarter combination | Samplers randomly  measure 50 individuals per species present in the harbor, following a predefined scheme | | Primary sampling unit | Auction\*day (in specific ports) | | Trip | | | Description | 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. | 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. | Seasonal fishery (May-September), where for every auction\*visit\_date,samplers aim to randomly sample a predefined number of vessel\_sale\_events, from vessels present at the harbor, which generally corresponds to the landings of one fishing trip. Samplers aim to sample boxes from every species and commercial category (at a minimum number of 50 fishes to be measured and/or weighted), applying concurrent sampling scheme A fishing effort related questionnaire is also performed to the shipmaster of the vessel selected for sampling. | In each vessel\_sale\_event, the observers aim to individually measure each specimen from every commercial species and commercial category. | | **3-Expected execution difficulties** | Some commercial species are landed frozen and packaged: only total landed weight is taken. | During the fishing season, after tuna quota is closed, fishing activity suspends until all tunas are sold. In some years it is difficult to carry out all planned sampling days. | Difficulties maybe raised by the fishing industry operators concerning fish access and handling. In these situations only the total landed weight is taken. | - | | **4-Data archiving and Quality assurance procedure** | Data stored locally at IPMA. | | Data is archived at DRP/RAA local database designed to accommodate this type of information. | Data is archived at DSEIMar/DRM local database designed to accommodate this type of information. | | Quality control to meet ICCAT requirements carried out before data are submitted to ICCAT, including: (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. All data is public at ICCAT Secretariat and website. | | | | | **5-Analysis procedures** | Stocks of the main ICCAT species are assessed regularly by the Scientific Committee for Research and Statistics (SCRS) of ICCAT. The methods are defined and applied according to the SCRS work. The frequency of the stock assessments is predefined according to the SCRS schedule of assessments and requests from the ICCAT Commission. | | | |   (\*) Stratification used to improve sampling coverage.  **At-sea sampling (RFMO/RFO/IO** ICCAT**):**  **Mainland (**Atlantic Ocean and adjacent seas**) -  PTS26 - LLD\_LPF (in Table 4A);**  **Azores (**Waters around Azores**) - AZS31 – LLD\_LPF (in Table 4A)**  **1.Specification of purposes**  The objective 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 vessels operating in the ICCAT area.  **2.Design**  Population:  Fish captured by the Portuguese longline vessels operating in the ICCAT area.  Target population: Fish captured by the Portuguese longline vessels in the main areas of operation of the Portuguese pelagic longline fleet, specifically in the Equatorial, Tropical Northeast, and Temperate Northeast Atlantic (ICCAT area).  Study population: Fish captured by the Portuguese longline vessels operating in the ICCAT area.  Sampling frame: List of cooperative vessels that are willing and have logistics (space and conditions) to take observers onboard.  Stratification type: Sampling stratified by areas/fleet components, covering the main areas of operation (Equatorial/Tropical and Temperate regions) and fleet components (Fresh and Freezer vessels).  Sampling effort: Sampling effort distribution in space and time is proportional to effort or landings. The goal is to cover a minimum of 5% of the total fishing effort, as currently recommended by ICCAT.  Primary Sampling Unit (PSU): Trip.  Description:  Vessels selection is quasi-random from within 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.  **3.Expected execution difficulties**  Increased number of vessels operating with skippers that do not allow observers on board.  **4.Data archiving and Quality assurance procedure**  Data are stored locally at IPMA and DRP/RAA. Quality control to meet ICCAT requirements is carried out before data are submitted to ICCAT. All data are public at the ICCAT Secretariat and website.  **5.Analysis methods**  Stocks of the main ICCAT species are assessed regularly by the Scientific Committee for Research and Statistics (SCRS) of ICCAT. The methods are defined and applied according to the SCRS work. The frequency of the stock assessments is predefined according to the SCRS schedule of assessments and requests from the ICCAT Commission.  **Madeira (**Waters around Madeira**) - LPF2\_ M3 (in Table 4A)**  **1.Objectives**  The main objectives of the” at-sea sampling programme” is to identify species composition (including discards), both in number, weight and lengths of specimens of Madeira active vessels catches which operate in FAO 34.1.2 and 34.2.0.  **2.Sampling Design**  Population: Lengths of fishes captured by the Madeiran vessels operating in FAO 34.1.2 and 34.2.0 (Within species).  Target population: Lengths of fish captured by the Madeira tuna vessels of all length classes that operate in FAO 34.1.2 and 34.2.0 (Within species).  Study population: Lengths of tuna captured by a subset of the Madeiran active vessels within each length class,  that operate in FAO 34.1.2 and 34.2.0 (Within species). The subset is composed of several fleet segments selected based on species landings. The list of vessels for each fleet segment is updated annually based on a combination of gear licenses and the main species landed in the previous year.  Sampling frame: List of cooperative vessels that are willing and have logistics (space and conditions) to take observers onboard.  Stratification type: vessel length class, métier and spatial (fishing grounds).  Sampling effort: Within each métier, sampling effort distribution in space and time is proportional to effort or landings.  Primary Sampling Unit (PSU): Trip  Description:  Vessels selection is quasi-random within a set of cooperative vessels. Every year, the following métiers and sampling effort objectives are set: LHP\_LPF (n=50 trips) . Within each métier, sampling effort distribution in space and time is proportional to effort or landings.  A pluriannual programme (2017-2019) will be implemented contracting an outsource service to implement the Madeira observers on board programme.  At-sea sampling is conducted by one scientific observer, accommodated voluntarily on board by the captain.  Every haul of a trip is selected for sampling and for each fishing operation data to be recorded includes: (i) type, and technical characteristics of the gear and fishing operations; (ii) geographical location of fishing sets; (iii) species composition of the total catch (retained and discarded), and landings (collected at the fish auction following the trip) in number and biomass; (iv) lengths of retained (subsample), discards (*census*) and landings (subsample); (v) reason for discarding each individual; (vi) the condition when discarded (alive/dead) and (vii) destiny of the retained fraction of the catch that might not be landed. Interactions with vulnerable fauna (e.g. sea-birds, sea-turtles and marine mammals) are also recorded.  The Madeira at-sea observer programme will collect comprehensive data on species composition and length composition of all retained and discarded components on a haul-by-haul basis, and therefore provides Scheme 1 concurrent sampling of Group 1 – 3 species. Landings from vessels with an observer on board, in specific trips will be sampled by the sampling technicians present at the landing harbour.  The target population is the total number of fishing trips, of a given metier, in a given time period, in Madeira fishing grounds.  **3.Expected execution difficulties**  Problems will occur regarding the access of the scientific observers on board fishing vessels that, either do not present the necessary conditions to take one extra person or refuse to accept them. Sampling targets depends critically on the goodwill of the fishing industry to at-sea sampling. Main difficulties will occur at the level of smaller vessels that cannot take observers on board.  **4.Data bases & Quality assurance procedure**  The database in EXCEL contains general trip information (vessel information, date, location, haul number, retained weight by species), along with sample information by fraction (retained, discarded) and species, namely weight, number of specimens and length composition.  Quality checks and validation procedures are implemented: (1) All samples are checked by a coordinator before the input of data (2) All data introduced in database is checked for errors and outliers; (3) A random check of 10% of the data is executed by inspecting the registered data for logical errors; (4) Length distribution and effort samples are then connected with the market landings for future cross examinations.  **Biological variables sampling**  **Madeira (**Waters around Madeira**) -** ICCAT  Biological variables sampling are performed (at the laboratory), to obtain stock related variables including, weight, sex-ratio and sexual maturity of fish landed and sold in auctions by the Madeiran vessels operating in the ICCAT area.  Most of the stocks are assessed within ICCAT Assessment Working Groups. Data preparation and stock assessment methods are defined by SCRS and described in the species work plans. Sampling for biological variables is independent of at-market sampling. Commercial sampling for biological variables (weight sex ratio and maturity) is performed annually for selected species by purchasing. Each individual is selected per length class (5 individuals/5 cm length class). Length-weight relationship and maturity ogive are estimated in time intervals indicated in Table 1B.  *(max 900 words per region)* |
| Deviation from the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701:  **2. Deviations from the Work Plan**  2.1 At-market sampling  2.1.1 Mainland (Atlantic Ocean and adjacent seas, BFT58)  Two sampling schemes / Stratum ID codes are included:  -”Longline for swordfish: At-market” / “PTM25 - LLD\_LPF (1 port)”  No deviations from the Work Plan.  -”Traps for large pelagic fish: At-market / PTM27” - “FPN\_LPF (1 port)”  Number of planned PSU was lower than planned because the number of auction x days was lower than in reference years since the *Thunnus thynnus* quota was reached earlier.  2.1.2 Azores (Azores grounds)  Although number of PSU increased in the sampling year, low sampling achievement for At-market “Pole and line for tuna at Market” / “AZM24 - LHP\_LPF \_<12m” was due to inexistence of landings in two of the ports with sampler presence. This was a consequence of undergoing repair works in main cold facilities which were disabled.  “Drifting Longline at Market” / “AZM29 - LLD\_LPF” was undersampled due to pandemic situation caused by COVID19 pandemic that, because of an imposed confinement, limited access to ports up until late March in São Miguel Island where major Azorean ports are located. Additionally, terrible weather conditions that occurred in the Azores region also led to a decrease in the number of samples collected.  2.1.3 Madeira (CECAF 34.1.2.)  No deviations from the Work Plan.  2.2 At-sea sampling  2.2.1 ICCAT longline - Mainland (Atlantic Ocean and adjacent seas) - PTS26 - LLD\_LPF (in Table 4A)  No deviations from the Work Plan.  2.2.2 ICCAT longline - Azores (Azores grounds) - AZS31 – LLD\_LPF (in Table 4A)  Oversampling occurred for the At-sea sampling Scheme / Stratum ID code AZS31 – LLD\_LPF. Two main reasons have contributed to this situation, although without extra expenses:   1. boarding of observers occurs in the remit of DCF and COSTA (Consolidating Sea Turtle Conservation in the Azores), project funded by the Marine Turtle Conservation Fund of the US Fish and Wildlife Service and the Archie Carr Center for Sea Turtle Research; 2. DCF sampling intensity was adapted due to some planned number of PSU (i.e. trip) per Scheme / Stratum ID code for 2020 being carried over to 2021. The main reasons were the closure of this fishery by the time procedures for at-sea sampling resumed due to COVID-19 and so that observers would not be in breach of signed contracts. On account of the time window when this decision occurred, this situation isn´t provided in the WP 2020-21 revised for 2021 submitted by 30th October 2020.   2.2.3 ICCAT Baitboat - Madeira (CECAF 34.1.2) - LPF2\_ M3 (in Table 4A)  In the sampling Scheme Large Pelagic species at-sea (Stratum ID code LPF2\_M3) the number of achieved PSU was lower than planned since onboard sampling could not be done in the first quarter of 2021 due to COVID 19 pandemic. In addition, the establishment of an onboard observer program was not possible due to failures in its implementation. Further, annual fishing trips suffered a reduction 40% for LPF2\_M3 in relation to reference years.  **3. Action to avoid deviations**  3.1 At-market sampling (ICCAT)  3.1.1 Mainland (Atlantic Ocean and adjacent seas, BFT58)  In what concerns the Sampling scheme / Stratum ID code ”Traps for large pelagic fish: At-market / PTM27” - “FPN\_LPF (1 port)”, no action needed.  3.1.2 Azores (Azores grounds)  Apart from the first trimester, sampling at market returned to normal in the Azores’ Outermost Region, applying all the National Health Organization recommendations.  Repair works on infrastructures of cold facilities are already completed and at the service of the fishermen.  3.1.3 Madeira (CECAF 34.1.2.)  No deviations from the Work Plan. No actions needed.  3.2 At-sea sampling  3.2.1 ICCAT longline - Mainland (Atlantic Ocean and adjacent seas) - PTS26 - LLD\_LPF (in Table 4A)  No deviations from the Work Plan. No actions needed.  3.2.2 ICCAT longline - Azores (Azores grounds) - AZS31 – LLD\_LPF (in Table 4A)  No actions planned.  3.2.3 ICCAT Baitboat - Madeira (CECAF 34.1.2) - LPF2\_ M3 (in Table 4A)  Efforts are in place to implement the onboard observer program for the sampling Scheme Large Pelagic species at-sea (Stratum ID code LPF2\_M3) in order to achieve the number of PSU planned. Furthermore, significant efforts are in place to assure the acquisition of information through surveys at the fishing ports in order to mitigate the lack of information collected on board. |

Text Box 4A.6: Region Other regions - RFMO/RFO/IO IOTC - Sub-area / Fishing ground Indian Ocean Western and Eastern

**TB 4A.6 At-sea sampling**

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| General comment: This box fulfills Article 3, Article 4 paragraph (4) and Article 8 of the Implementing Decision (EU) 2016/1701 on the format of the WP and forms the basis for the fulfilment of paragraph 2 point (a)(i) of Chapter III of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. This Table refers to data to be collected under Tables 1(A), 1(B) and 1(C) of the delegated decision on the multiannual Union programme. |
| General comment: This box is applicable to the Annual Report. This box should provide information on the deviations from the planned sampling of Member States. |
| 1. Description of the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701 on the format of the WP.  **At-sea sampling (**IOTC**): PTS26 - LLD\_LPF (in Table 4A)**  **1.Specification of purposes**  The objective of at-sea sampling is to obtain the species composition and length distribution of total catches (discards + landings) from the Portuguese longline vessels operating in the IOTC area.  **2.Design**  Population:  Fish captured by the Portuguese longline vessels operating in the IOTC area.  Target population: Fish captured by the Portuguese longline vessels operating mainly in the SW Indian Ocean (IOTC area).  Study population: Fish captured by the Portuguese longline vessels operating in the IOTC area.  Sampling frame: List of cooperative vessels.  Stratification type: No stratification. Most of the effort of the Portuguese pelagic longline fleet in the IOTC area is in the South and Southwest Indian Ocean.  Sampling effort: Sampling effort distribution in space and time is proportional to effort or landings. The goal is to cover a minimum of 5% of fishing effort, as recommended by IOTC.  Primary Sampling Unit (PSU): Trip.  Description:  Vessel selection is quasi-random from within 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.  **3.Expected execution difficulties**  Decreasing number of vessels with capacity and willing to carry observers on board. Some vessels of the fleet moving to Pacific Ocean in recent years.  **4.Data archiving and Quality assurance procedure**  Data are stored locally at IPMA. Quality control to meet IOTC requirements is carried out before data are submitted to IOTC. All data are public at the IOTC Secretariat and website.  **5.Analysis methods**  Stocks of the main IOTC species are assessed regularly by the Scientific Committee (SC) of IOTC. The methods are defined and applied according to the SC work. The frequency of the stock assessments is predefined according to the SC schedule of assessments and requests from the IOTC Commission.  *(max 900 words per region)* |
| Deviation from the sampling plan according to Article 5 paragraph (3) of the Implementing Decision (EU) 2016/1701:  2. Deviations from the Work Plan  At-sea sampling only.  No sampling in 2021. Onboard sampling in IOTC could not be done due to the COVID19 pandemic (refusals from the fleet and restriction in international travels).  3. Action to avoid deviations  Deviations in sampling due to COVID-19 pandemic are not expected to continue to occur in 2022. |

Section 5: data quality

Text Box 5A: Quality assurance framework for biological data

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| General comment: This box is applicable to the Annual Report. This box fulfills Article 5 paragraph (2) point (a) of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is intended to specify data to be collected under Tables 1(A), 1(B) and 1(C) of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. Use this box to provide additional information on Table 5A of the Annual Report. |
| **Region “Southern Western waters (ICES zones VIII, IX)” - RFMO/RFO/IO ICES**  **a) At-sea and at-market sampling**  **1. Evidence of data quality assurance**  Links were provided for documentation on sampling design, data capture and data processing for all sampling schemes.  **2. Sampling design**  No constrains.  **3. Sampling implementation**  At-sea sampling - No constraints.  At-market sampling - Recording of refusal rates has been initiated and will be further developed in 2022-2024.  **4. Data capture**  No constrains.  **5. Data Storage**  No constrains.  **6. Data processing**  No constrains.  **b) Anadromous and catadromous species data collection in fresh water**  Pilot study 1E  **1. Evidence of data quality assurance**  Sampling design, data capture and data processing are documented in the pilot project report. For a matter of internal policy of the institutions involved, the report is in a private repository during a moratorium period and will be made publicly available at the end of that moratorium.  **2. Sampling design**  No constrains.  **3. Sampling implementation**  No constrains.  **4. Data capture**  No constrains.  **5. Data Storage**  No constrains.  **6. Data processing**  No constrains.  **c) Pilot Studies 1.1 and 1.2: Relative share of catches of sea bass recreational fisheries compared to commercial fisheries in Mainland (PS1.1) and Relative share of catches of recreational fisheries compared to commercial fisheries in Mainland: Pollack, elasmobranchs, highly migratory species and eel (PS1.2)**  **1. Evidence of data quality assurance**  As explained in text box 1D, due to the pandemic, this phase of Pilot study did not take place, as it was constantly postponed. PRT has nothing to comment on points 2, 3, 4, 5 and 6.  **2. Sampling design**  NA.  **3. Sampling implementation**  NA.  **4. Data capture**  NA.  **5. Data Storage**  NA.  **6. Data processing**  NA.  **d) Pilot Study 2: Level of fishing and impact of fisheries on biological resources and marine ecosystem**  **1. Evidence of data quality assurance**  NA. Based on data from research surveys included in the WP.  **2. Sampling design**  NA. Based on data from research surveys included in the WP.  **3. Sampling implementation**  NA. Based on data from research surveys included in the WP.  **4. Data capture**  NA. Based on data from research surveys included in the WP.  **5. Data Storage**  NA. Based on data from research surveys included in the WP.  **6. Data processing**  NA. Based on data from research surveys included in the WP.  **Region “Other regions” - RFMO/RFO/IO “IOTC”**  **1. Evidence of data quality assurance**  Links were provided for documentation on sampling design, data capture and data processing for this sampling scheme.  **2. Sampling design**  No constrains.  **3. Sampling implementation**  Recording of refusal rates will be developed in 2022-2024.  **4. Data capture**  No constrains.  **5. Data Storage**  No constrains.  **6. Data processing**  No constrains.  **Region “Eastern Artic (ICES areas I and II)” - RFMO/RFO/IO “ICES”**  **1. Evidence of data quality assurance**  Links were provided for documentation on sampling design, data capture and data processing for these sampling schemes.  **2. Sampling design**  No constrains.  **3. Sampling implementation**  Recording of refusal rates will be developed in 2022-2024.  **4. Data capture**  No constrains.  **5. Data Storage**  No constrains.  **6. Data processing**  No constrains.  **Region “NAFO (FAO area 21)” - RFMO/RFO/IO “NAFO”**  **1. Evidence of data quality assurance**  Links were provided for documentation on sampling design, data capture and data processing for this sampling scheme.  **2. Sampling design**  No constrains  **3. Sampling implementation**  Recording of refusal rates will be developed in 2022-2024.  **4. Data capture**  No constrains.  **5. Data Storage**  No constrains.  **6. Data processing**  No constrains.  **Region “Other regions” - RFMO/RFO/IO “ICCAT”**  **a) At-sea and at-market sampling**  **1. Evidence of data quality assurance**  Links were provided for documentation on sampling design, data capture and data processing for all sampling schemes.  **2. Sampling design**  No constrains.  **3. Sampling implementation**  No constrains.  For “Longline for swordfish: At-sea", “Longline for swordfish: At-market", “Traps for large pelagic fish: At-market" - Recording of refusal rates will be developed in 2022-2024.  **4. Data capture**  No constrains.  **5. Data Storage**  No constraints.  **6. Data processing**  No constrains.  **Region “Southern Western waters (waters around Azores)”**  **a) At-sea and at-market sampling - RFMO/RFO/IO “ICES”**  **1. Evidence of data quality assurance**  Sampling design documentation was developed for sampling scheme “Grappling Patellidae - at market”. Links were provided for documentation on sampling design, quality checks for data capture and editing and imputation for “all sampling schemes”.  The contract of a database developer was not able to be established in 2021 due to COVID-19 pandemic and is expected to be in force during WP2022-2024.  **2. Sampling design**  No constraints.  **3. Sampling implementation**  No constraints.  **4. Data capture**  No constraints.  **5. Data Storage**  No constraints.  **6. Data processing**  No constraints.  **Region “Southern Western waters (CECAF area 34.1.2 - waters around Madeira)”**  **a) At-sea and at-market sampling - RFMO/RFO/IO “CECAF”**  **1. Evidence of data quality assurance**  Documentation on sampling design for Small Pelagic species on-shore (sampling frame SPF1\_M2), Small Pelagic species at-sea (sampling frame SPF2\_M2) and Patellidae on-shore (sampling frame MOL1\_M4) was developed in 2021 and included in the WP2022-2024. Links and information on Sampling (sampling design) and Data Processing (quality accuracy and editing and imputation methods) are provided.  **2. Sampling design**  No constraints.  **3. Sampling implementation**  No constraints.  **4. Data capture**  No constraints.  **5. Data Storage**  No constraints.  **6. Data processing**  No constraints. |

Section 5: data quality

Text Box 5B: Quality assurance framework for socioeconomic data

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| General comment: This box fulfills Article 5 paragraph (2) point (b) of the Implementing Decision (EU) 2016/1701 on the format of the WP. This box is intended to specify data to be collected under Tables 5(A), 6 and 7 of the Annex of the Delegated Decision (EU) 2019/910 on the multiannual Union programme. Use this box to provide additional information on Table 5B of the Annual Report. |
| 1. Evidence of data quality assurance  Sector name**:** Fisheries  Statistical procedure is censitary so no sample is defined  Survey:  Data sources used for the estimation of economic variables are administrative data, logbooks, sales notes and surveys addressed to all vessel owners. The basic unit for the data collection is the vessel and the target population is constituted by all active and inactive vessels listed in the Union Fishing Fleet Register on 31 December of the reporting year and other vessels that have fished for at least one day during the reporting year.  Variables related to fleet capacity are collected from the National administrative database while effort and landings are obtained from sales notes and logbooks. These data are provided by the controlling body under Regulation (EU) n. º 1224/2009 (DGRM) which has the data stored in its own database.  Social variables of the engaged crew are obtained from administrative data recorded on the National System of Vessels and Maritime (SNEM) database, owned by DGRM.  An annual survey is conducted by DGRM to collect socio-economic information. The questionnaires are available to all active vessel owners on the [BMAR](http://www.bmar.pt/) platform. Since 2021, answering the questionnaire is required by national law to obtain a fishing licence, being expected an increase in the response rate. In order to achieve high quality responses from shipowners, the questionnaire design will be improved. The data is validated with several checks: the survey does not allow filling in impossible/unreasonable values; manual checks are carried out in relation to the consistency of the data; historical analysis and coherence comparison with administrative data (e.g. declared revenues against sum of sales notes, fuel use against the administrative records maintained by DGRM in relation to the reimbursement of excise taxes to fishermen).  To improve the response rate of questionnaires, the survey is planned in waves. A first wave with the initial contact, consisting of a cover letter/email explaining the purpose of the survey. A second wave, consisting of an email to the professional organizations and the Regional Directorates of the Ministry, approaching to ‘push’ for higher response. In some cases, the professional organizations receive the information from the owners and fill in the forms on their behalf. And, a third wave, consisting of a reminder postcard/email/phone.  In some cases, the professional organizations receive the information from the owners and fill in the forms on their behalf. And, a third wave, consisting of a reminder postcard/email/phone.  Estimation:  The stratification is based on vessel size, gear and supra-region. The segmentation of the population for the survey design is more detailed than what is required by EUMAP in order to achieve better estimation. The following further details are distinguished:  -The EUMAP size class 0-10m is split into two size classes of 0-7m and 7-10m.  -DFN class distinguishes DFN and MINHO-PV, a specific type of drift nets.  -DTS class distinguishes four types of bottom trawls – general, crustaceans, fish and various.  -MGP is split into MGO and MGP.  -PS is split into two types of purse seines.  An SQL code has been designed for estimation of missing data and calculation of segment and national totals.  The methodology used to deal with non-responses and incorrect values is described point 5.3.2 of the Handbook on sampling design (Mean imputation).  Error checks:  Quality control is performed on the survey responses through a script that relates the inputs from each survey and also compares them with administrative data. Early detection of these errors allows for timely action to contact respondents to correct the issues.  The database is programmed in Oracle and contains internal routines for the detection of basic errors. Also checks are performed using R and SQL routines  All data processed under the socioeconomic data collection is stored on DGRM database of the electronic platform BMAR one-stop-shop.  Information related to the data collection program can be found on the web pages:  [National Data Collection Program](https://www.dgrm.mm.gov.pt/web/guest/pnrd)  [Survey on socio-economic data of the national fishing fleet](https://www.dgrm.mm.gov.pt/pt/portos_instalacoes_portuarias?articleId=338078)  Sector name: Aquaculture  Census survey:  As much as the aquaculture sector is concerned, Portuguese Fisheries Administration acts as the national authority for the production of statistical data. Ever since, all work undertaken within the aquaculture sector is related to the production of data under the European Statistical System.  Following the publication of the Regulation (EC) no. 762/2008, DGRM developed a statistical operation, together with the National Institute for Statistics, performed annually. The sample unit is the enterprise and the population comprehends all those establishments that, in the reference year, had legal conditions to undertake any aquaculture activity.  The survey that supports the Aquaculture programme focus on production for all the aquaculture establishments and collected economic and social data for all the enterprises regardless of being the first or second activity.  The online surveys are available on [https://bmar.pt](https://bmar.pt/) to all enterprises.  Estimation process for primary variables is supported by estimators of total for census.  To deal with non-responses, a problem mainly concerned with micro enterprises units for production of shellfish farming (clams), the developed methodology is based on the application of raising factors. Each year, based on the collected answers, the average yield (Y) of production, tonnes per hectare, is estimated. For all non-respondents units, based on their farming area, and applying the annual yield, the total clam production for the reference year is estimated. For non-responses on other variables in imputation of the segment average value is made.  Employment variables, such as FTE will be estimated in accordance with Guidance Document for the Aquaculture (last update PGECON 2020).  Error checks:  The data collected are subject to a series of validation procedures and values by segment are plotted to identify extreme values. For some extreme values, corrections on the dimensions are made (kilos to tonnes and kilos to grams), for other extreme values a direct contact with the enterprise in order to confirm them.  Data input are stored into tables on database of electronic platform of BMar one-stop-shop.  2. Section P3 Impartiality and objectiveness  Nothing to report.  3. Section P4 Confidentiality  Nothing to report.  4. Section P5 Sound methodology  Nothing to report.  5. Section P6 Appropriate statistical procedures  Nothing to report.  6. Section P7 Non-excessive burden on respondents  Nothing to report  7. Section P8 Cost effectiveness  Nothing to report  8. Section P9 Relevance  Nothing to report  9. Section P10 Accuracy and reliability  Nothing to report  10. Section P11 Timeliness and punctuality  Nothing to report.  11. Section P12 coherence and comparability  Nothing to report.  12. Section P13 Accessibility and Clarity  Nothing to report. |