

## Sampling plan description for biological data

### Madeira At Sea CECAF

<b>MS:</b> PRT
<b>Region:</b> Southern Western waters (waters around Madeira) - CECAF
<b>Sampling scheme names:</b> Deep species at-sea; Small Pelagic species at-sea
<b>Sampling scheme type:</b> At sea
<b>Time period of validity:</b> 2021-2024
<b>Short description:</b> <p>The objective of this sampling scheme is to identify and characterize catch fractions with a specific species composition from Madeiran vessels operating in FAO 34.1.2 (RFMO/RFO/IO CECAF), particularly for species listed in Table 1 of the EU MAP Delegated Decision annex (2021/1167/EU). Data collection includes both landings and discards, in terms of number and volume of specimens, and in length frequency distributions. Occurrence of incidental bycatch of PETS (Protected Endangered and Threatened Species) is also recorded.</p>
<b>Description of the population</b>
<b>Population targeted:</b> <p>The primary sampling scheme design is set to measure fish lengths from commercial species harvested by Madeiran vessels of all length classes operating in FAO 34.1.2. The sampling frame includes a list of vessels for each fleet segment/métier that can provide for and are willing to take onboard observers. Furthermore, within each métier, sampling effort distribution in space and time is proportional to effort and/or landings. Finally, the primary sampling unit (PSU) considered for this sampling scheme is vessel*trip.</p>
<b>Population sampled:</b> <p>Population sampled: All vessels</p> <p>Fish lengths are obtained from sampling a subset harvested by Madeiran active vessels operating in FAO 34.1.2. This subset includes several fleet segments selected based on the species landed at auction. The list of vessels by segment is updated annually based on gear type licenses and on the main species landed in the previous year. Additionally, vessel selection for sampling is performed randomly. Every year, the following métiers and correspondent sampling effort goals are set:</p> <ul style="list-style-type: none"><li>a. Stratum ID code DWF2_ M1, n=17 trips;</li><li>b. Stratum ID code_SPF2_ M2, n=15 trips.</li></ul> <p>Furthermore, a pluriannual observer programme (2022-2024) will be implemented by contracting an outsourced service to implement it aboard Madeiran fishing vessels.</p>
<b>Stratification:</b> Sampling scheme stratification includes vessel length class and métier. Overall, stratification is implemented to improve sampling coverage throughout the year.

## Sampling design and protocols

### Sampling design description:

At-sea sampling is conducted by scientific observers, who are voluntarily accommodated on board by the owner of the vessel and/or the shipmaster.

Every trip's haul is selected for sampling and, for each fishing operation, recorded data includes:

- a. gear type and technical characteristics of the fishing operation;
- b. geographical location of fishing sets;
- c. species composition of the total catch (retained and discarded), and landings (collected at the fish auction following the trip) in number and biomass;
- d. lengths of retained (subsample), discards (census) and landings (subsample);
- e. sex for elasmobranchs and crustaceans;
- f. reason for discarding each individual;
- g. condition upon discarded (alive/dead);
- h. outcome for the retained fraction of the catch that might not be landed;
- i. interactions with vulnerable fauna (e.g. sea-birds, sea-turtles and marine mammals) are also recorded.
- j. Occurrence of incidental bycatch of PETS (Protected Endangered and Threatened Species) is also recorded.

The Madeira at-sea observer programme will collect comprehensive data on species length composition of all retained and discarded fractions on a haul-by-haul basis, and therefore will provide Scheme 1 concurrent sampling of Group 1 – 3 species. Landings from vessels with an observer on board will be further statically sampled by at-port observers, on previously randomly assigned dates.

The target population corresponds to the total number of fishing trips for a given métier and during a specific time period.

**Is the sampling design compliant with the 4S principle?:** Y

**Regional coordination:** N

**Link to sampling design documentation:** <https://marmadeira.com/publicacoes/>

**Compliance with international recommendations:** Y

**Link to sampling protocol documentation:** <https://marmadeira.com/publicacoes/>

## Sampling implementation

**Recording of refusal rate:** Y

**Monitoring of sampling progress within the sampling year:**

Sampling design is monitored and adjusted throughout the year in order to reach the minimum number of samples required.

However, some difficulties are expected, namely regarding observers' boarding authorisation by the

vessel owner and/or the shipmaster. Aside from gathering all the appropriate conditions, there must be a willingness to cooperate with the scientific observers. Consequently, smaller vessels do not qualify to participate in the programme.

### **Data capture**

**Means of data capture:** Commercial species length data is obtained through measurements, using either a big measuring board or a measuring tape, depending on the size of the individuals sampled. Observations are noted down on appropriate sampling sheets. A posteriori, a sampling ID number is allocated for a specific landing/sampling event and observations are verified and logged into a computer data base.

**Data capture documentation:** <https://marmadeira.com/publicacoes/>

### **Quality checks documentation:**

Y. The Microsoft Excel © local database includes information by trip (vessel information, date, fishing location(s), landed weight by species) and statistical sampling information (species, sample weight, number of sampled specimens and length observations).

Quality checks and validation procedures are implemented:

1. All samples are checked by the coordinator before the data is inputted into the local database;
2. After all data is introduced into the local database it is subsequently 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 information is then connected with vessel logbooks for future cross examinations.

### **Data storage**

**National database:** Local Database

**International database:** RDB/RDBES

**Quality checks and data validation documentation:** The obtained data is used for the elaboration of peer-reviewed scientific publications with an impact factor, and hence data quality is assured by journal editorial boards and reviewers.

### **Sample storage**

**Storage description:** NA

**Sample analysis:** NA

### **Data processing**

**Evaluation of data accuracy (bias and precision):** Data accuracy is evaluated by experts / stock

assessors during preparation and analysis of data for expert / assessment working groups.

**Editing and imputation methods:** Editing and imputation methods are developed by experts / stock assessors during preparation and analysis of data for expert / assessment working groups.

**Quality document associated to a dataset:** Quality of datasets is documented in upload logs of data submitted to data calls and in expert / assessment working groups / regional coordination groups reports.

**Validation of the final dataset:** Final datasets are validated by experts / stock assessors during expert / assessment working groups / regional coordination groups.