

Sampling plan description for biological data

Madeira At market CECAF

M.S: PRT
Region: Southern Western waters (waters around Madeira) - CECAF
Sampling scheme names: Deep species on-shore; Small Pelagic species on-shore; Mollusc species on-shore.
Sampling scheme type: At market
Time period of validity: 2021-2024
Short description: <p>The objective of this sampling scheme is to collect length-frequency distributions of commercial fish and mollusc species landed at auctions by Madeiran vessels operating in FAO 34.1.2 (RFMO/RFO/IO CECAF), for species listed in Table 1 of the EU MAP Delegated Decision annex (2021/1167/EU). Occurrence of incidental bycatch of PETS (Protected Endangered and Threatened Species) is also recorded.</p>
Description of the population
Population targeted: <p>The primary sampling scheme design is set to measure fish and mollusc lengths from commercial species landed at auction (=port) by Madeiran vessels operating in FAO 34.1.2. The sampling frame includes a list of port*day for each fleet segment. Furthermore, within each métier, sampling effort distribution in space and time is proportional to landings in each port*month. Finally, the primary sampling unit (PSU) considered for this sampling scheme is vessel*trip.</p> <p>Population sampled:</p> <p>i) Single main Madeira port for Stratum ID code DWF1_M1 and Stratum ID code SPF1_M2: FUNCHAL</p> <p>Landed 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.</p> <p>The sampled population includes fish lengths collected per trip by vessels operating mid-water drifting longlines targeting deep sea species like <i>Aphanopus carbo</i> and <i>A. intermedius</i> (Stratum ID code DWF1_M1). Regarding purse seine boats targeting small pelagic fish (Stratum ID code SPF1_M2), catches are composed of mixed species. The main species (<i>Scomber colias</i> and <i>Trachurus</i> spp) are randomly sampled upon landing according to protocol.</p> <p>The main port in Madeira Island is considered for the above-mentioned sampling design and</p>

around 10% of the total annual fishing trips are predicted to be sampled.

Other Madeira ports of this métier: no ports

ii) Two main Madeira ports for Stratum ID code MOL1_M4: PORTO MONIZ and PAÚL DO MAR

Concerning this fishery, landed limpet lengths are obtained from sampling a subset harvested by Madeiran active vessels operating in the outermost region of Madeira, 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 harvesting licenses from the previous year.

The sampled population includes limpet lengths collected per trip by vessels targeting commercial limpet species. Upon landing, Patellidae species are usually mixed and hence are randomly sampled by the observers.

The two main ports in which limpets are landed in Madeira Island are considered for the above-mentioned sampling design, and around 5% of the total annual fishing trips are predicted to be sampled.

Stratification: Sampling scheme stratification includes ports on a spatial scale and months on a temporal scale. Overall, stratification is implemented to improve sampling coverage throughout the year.

Sampling design and protocols

Sampling design description:

The sampling design is a stratified multistage scheme, with vessel*trip as the Primary Sampling Unit (PSU):

a) The Madeiran fleet is stratified by segment and métier, and by trip and month. According to EU Map requirements [EU Commission Delegated Decision (2021/1167/EU)], sampling effort is established as number of trips. Additionally, annual sampling effort is fixed by the National Work Plan for Data Collection, which sets the number of trips expected to be sampled by métier.

b) For each segment/métier, visit_date for each auction*month is spread systematically throughout the month in order to cover all week-days where the fleet is active.

c) In every auction*visit_date, observers attempt to sample a predefined number of vessel_sale_event. Each vessel_sale_event generally corresponds to one fishing trip landings. To select the vessel_sale_event 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, observers aim to sample boxes from every commercial species

and commercial category.

e) Within each commercial category, observers select 1 box haphazardly. Nonetheless, sometimes there are less than 100 individuals from a certain commercial species in 1 box, therefore observers sample several different boxes in order to reach the minimum sampling size required.

f) Regarding the sampling frame identifier DWF1_M1, different species may be present in the same box. Considering that *Aphanopus carbo* and *A. intermedius* are two sympatric and morphologically not easily distinguished, observers sample all individuals in the same box without distinction.

g) Occurrence of incidental bycatch of PETS (Protected Endangered and Threatened Species) is also recorded.

References:

Delgado J, Reis S, González JA, Isidro E, Biscoito M, Freitas M, Tuset VM (2013). Reproduction and growth of *Aphanopus carbo* and *A. intermedius* (Teleostei: Trichiuridae) in the northeastern Atlantic. *Journal of Applied Ichthyology* 29, 1008-1014.

Nakamura I, Parin NV (1993). Snake mackerels and cutlassfishes of the world (Families Gempylidae and Trichiuridae). An Annotated and Illustrated Catalogue of the Snake Mackerels, Snoeks, Escolars, Gemfishes, Sackfishes, Domine, Oilfish, Cutlassfishes, Scabbardfishes, Hairtails, and Frostfishes Known to Date. FAO, Rome

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.

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. Sampling is executed by two observers, one of which is responsible for measuring and the other for taking note of data. À 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.

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