

Sampling scheme identifier: **Madeira Biological parameters specific CECAF**

MS: PRT
Region: Other regions
Sampling scheme identifier: Madeira Biological parameters specific CECAF
Sampling scheme type: Biological parameters specific
Observation type: SciObsOnShore
Time period of validity: 2025-2027
Short description (max 100 words): The objective of this sampling scheme (Work Plan – Table 2.2) is to collect biological variables (weight, age, sex and maturity of selected species in Work Plan – Table 2.2) of commercial fish 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). The fish samples are purchased from selected ports at Madeira.
Description of the population
Population targeted: Biological variables (age, weight, sex and maturity) are collected from fish species listed in the Work Plan – Table 2.2, from landings at Madeira auctions (=ports) by Madeiran active vessels (licenced to operate in FAO 34.1.2 (RFMO/RFO/IO CECAF)). Population sampled: Biological variables (age, weight, sex and maturity) are collected from fish species listed in the Work Plan – Table 2.2, from landings at Madeira auctions (=ports) by Madeiran active vessels (licenced to operate in FAO 34.1.2 (RFMO/RFO/IO CECAF)). Primary Sampling Unit (PSU): vessel * trip 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: 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)]. Annual sampling effort (number of planned PSUs = vessel x trip = onshore events) is fixed per selected species (of the Work Plan - Table 2.2). b) Sampling effort (number of vessel * trip = onshore events = PSUs) is allocated to vessel and months based on landings from previous reference years. c) In every vessel x trip, for every selected species the observers attempt to sample every commercial size category, by randomly selecting 1 box from each commercial size category. d) Within each commercial category samplers randomly select boxes to be sampled (in situ for lengths) aiming for a minimum number of 50 fishes. The commercial sampling for biological variables in laboratory (weight, age, sex and maturity) is carried out by samplers that select a sample per length class (5 individuals/ 5 or 10cm length class, depending on the species).

e) Biological variables sampling, using standardized protocols, is performed in the laboratory in order to obtain stock-related variables such as biometry, age, sex and sexual maturity of the landed fish harvested by Madeiran fishing vessels operating in the CECAF FAO 34.1.2 area and sold at the auction houses.

f) Concerning scabbard fishes, the species *Aphanopus carbo* and *Aphanopus intermedius* are usually landed together, with a dominance of *A. carbo* (80%, see Delgado et al., 2013). These two species are sympatric and morphologically not easily distinguished when statistically sampled for length. Consequently, only biological variables sampling allows to identify *A. intermedius* (Nakamura & Parin, 1993). As such, this species is sampled opportunistically.

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/>

Design follows international recommendations:

Y.

Link to sampling protocol documentation:

<https://marmadeira.com/publicacoes/>

Protocol follows international recommendations:

Y.

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:

Biological variables data is collected with measuring boards, heavy-duty balance, precision balance, optical imaging equipment with digital cameras incorporated (including digital image analysis software).

Data capture documentation:

<https://marmadeira.com/publicacoes/>

Quality checks documentation:

Y.

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:

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:

Both otoliths and stomachs are kept in storage after biological sampling of specimens of a commercial species. Otoliths are extracted, rinsed and tagged upon storage. After analysis for age determination, samples are kept in Eppendorf tubes and included in the regional collection. Stomachs are extracted and kept refrigerated until analysis, where the hard part contents are kept and tagged in the collection, whilst the remaining components are discarded after identification of food sources.

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.