

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

MS: PRT
Region: Outermost regions
Sampling scheme identifier: Madeira Biological parameters specific NA
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, sex and maturity of commercial limpet species (Patellidae) landed at auctions by Madeiran vessels operating in Madeira outermost region - FAO 34.1.2. (RFMO/RFO/IO - NA), for species listed in Table 1 of the EU MAP Delegated Decision annex (2021/1167/EU). Limpets' samples are purchased from selected ports at Madeira.
Description of the population
Population targeted: Biological variables (weight, sex and maturity) are collected from selected commercial limpet's species included in the species listed in the Work Plan – table 2.2, from limpets landed at Madeira auctions (=ports) by Madeiran active vessels (licenced to operate in FAO 34.1.2 (RFMO/RFO/IO NA). Primary Sampling Unit (PSU): vessel * trip
Population sampled: Biological variables (weight, sex and maturity) of selected limpet species included in the species listed in the Work Plan (table 2.2.).
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 * trip = onshore events) is fixed per selected species (of the Work Plan - Table 2.2). All commercial catches require landings at auction houses and logbook provision (catches by species, number of harvesters, days at sea, fishing days, fishing zone, depth, etc). This information allows to determine the fishing effort of limpets harvesting. 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 * 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 limpets. The commercial sampling for biological variables in laboratory (length, weight, sex and maturity) is carried out by samplers that select a sample per length class (5 individuals from 2 cm length classes, depending on the species).

e) Biological variables sampling follows standardized protocols depending on the species. Length-weight relationships and maturity ogives are estimated for certain time periods (see Sousa et al., 2017).

References:

Sousa R, Delgado J, Pinto AR, Henriques P (2017). Growth and reproduction of the north-eastern Atlantic keystone species *Patella aspera* (Mollusca: Patellogastropoda). *Helgoland Marine Research*, 71,8

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

Y.

Regional coordination:

N.

Link to sampling design documentation:

Sousa R, Delgado J, Pinto AR, Henriques P (2017). Growth and reproduction of the north-eastern Atlantic keystone species *Patella aspera* (Mollusca: Patellogastropoda). *Helgoland Marine Research*, 71,8. DOI 10.1186/s10152-017-0488-9.

Design follows international recommendations:

Y.

Link to sampling protocol documentation:

Sousa R, Delgado J, Pinto AR, Henriques P (2017). Growth and reproduction of the north-eastern Atlantic keystone species *Patella aspera* (Mollusca: Patellogastropoda). *Helgoland Marine Research*, 71,8. DOI 10.1186/s10152-017-0488-9.

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 callipers, 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: Limpet gonads are kept in storage after specimens are sampled. Gonads are extracted and kept in Roti®-Histofix Eco Plus and refrigerated until histological analysis. After this procedure, histological slides are included in the local collection. 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.