

Sampling plan description for biological data

Mainland At Sea ICES

MS: PRT
Region: Southern Western waters (ICES zones VIII, IX) - IX
Sampling scheme names: Gill and trammel nets for demersal fish: At-sea; Longline for black scabbardfish: At-sea; Trawlers for demersal fish: At-sea; Trawlers for crustaceans: At-sea; Purse seiners for sardine and other small pelagic fish: At-sea; Beam trawl for shrimps: At-sea
Observation type: Scientific observer at sea (on commercial or scientific vessels)
Time period of validity: 2021-2024
Short description: Sampling schemes aiming at sampling catch (discards + landings) composition, volume, length of species and biological variables (age, weight, sex, maturity of selected species) captured by Portuguese vessels operating in ICES 27.9.a. All species sampled are listed in Table 1 of the EU MAP Delegated Decision annex. Observation of PETS (Protected Endangered and Threatened Species) is also covered within the sampling scheme (along with quantification of PETS observation effort).
Description of the population
Population targeted: Population: lengths of species and biological variables (age, weight, sex, maturity of selected species) captured by Portuguese vessels operating in ICES 27.9.a. Population targeted: lengths of species and biological variables (age, weight, sex, maturity of selected species) captured by Portuguese vessels with length overall >12m operating in ICES 27.9.a. Population studied: lengths of species and biological variables (age, weight, sex, maturity of selected species) captured by a subset of Portuguese vessels with length overall >18m operating in ICES 27.9.a from a fleet segment (~metier), based on a combination of gear licenses and the main species landed in previous year. Primary Sampling Unit (PSU): fishing trip
Population sampled: Population sampled / not sampled per metier and sampling scheme: -Metier GNS_GTR: Population sampled: Vessels >12m Stratum ID code: PTS3 - GNS_GTR_DEF _ ICES 27.9.a _ in sampling frame Population not sampled: Vessels <12m Stratum ID code: PTS4 - GNS_GTR_DEF _ ICES 27.9.a _ out of sampling frame

-Metier LLS_DWS:

Population sampled: Vessels >12m

Stratum ID code: PTS9 - LLS_DWS _ ICES 27.9.a _ in sampling frame

Population not sampled: Vessels <12m

Stratum ID code: PTS10 - LLS_DWS _ ICES 27.9.a _ out of sampling frame

-Metier OTB_DEF:

Population sampled: Vessels >24m

Stratum ID code: PTS12 - OTB_DEF _ ICES 27.9.a _ in sampling frame

Population not sampled: Vessels <24m

Stratum ID code: PTS13 - OTB_DEF _ ICES 27.9.a _ out of sampling frame

-Metier OTB_CRU:

Population sampled: Vessels >12m

Stratum ID code: PTS15 - OTB_CRU _ ICES FU 28-29 _ in sampling frame

Population not sampled: Vessels <12m

Stratum ID code: PTS16 - OTB_CRU _ ICES FU 28-29 _ out of sampling frame

-Metier PS_SPF:

Population sampled: Vessels >12m

Stratum ID code: PTS18 - PS_SPF _ ICES 27.9.a _ in sampling frame

Population not sampled: Vessels <12m

Stratum ID code: PTS19 - PS_SPF _ ICES 27.9.a _ out of sampling frame

-Metier TBB_MCD:

Population sampled: All vessels

Stratum ID code: PTS21 - TBB_MCD _ ICES 27.9.a _ in sampling frame

Stratification: Stratification is used to improve sampling coverage through the year (by quarter) and along the Portuguese coast (by area).

Sampling design and protocols

Sampling design description:

At sea sampling schemes sample Catches (All fractions).

a) The Portuguese fleet is stratified by fleet (~metier), area and quarter. Following the DCF requirements, less significant fleets (~metiers) are not sampled (e.g. dredges, beach-seines). Annual sampling effort (number of planned PSUs = fishing trips) is fixed and is allocated to the different fleets (~metiers) based on a Neyman allocation (metiers OTB_DEF and OTB_CRU), monthly frequency (metiers LLS_DWS, TBB_CRU) or quarterly frequency (metiers GNS_GTR, PS_SPF).

b) For each fleet (~metier), sampling effort (number of fishing trips) is allocated to areas and

quarters based on effort and/or landings from previous reference years. For each fleet (~metier), each temporal event (week) is selected by SRSWR, vessel is selected by SRSWR and fishing trip (= PSU) is selected by SRSWOR.

c) Scientific observers sort the sample into catch fractions according to the crew's criteria in the sampled haul. The onboard sampling procedure differs between active (OTB, TBB and PS) and fixed metiers/gears (GNS, GTR, LLS_DWS) (Prista *et al.*, 2012; Jardim *et al.* 2012, Feijó *et al.*, 2012).

Briefly, in active metiers/gears (OTB_DEF, OTB_CRU, TBB_CRU) haul selection is systematic (odd or even) after a random choice of the starting haul between first or second. In PS_SPF all hauls are selected. For each haul selected for sampling, and before the catch is sorted by the crew, the scientific observer randomly selects a sample. Each sample is sorted and weighed by species and catch fraction. In the sample, individuals are sampled for length, and a sub sample is selected for sampling (in situ or in laboratory) of other biological variables (age, weight, sex, maturity) of selected species. Landed volume is estimated by the skipper. Catch volume is estimated independently from skipper's opinion, based on the relative proportion between discard and landing fractions in the sample taken from the catch and raised by total landings.

Briefly, in passive metiers (GNS_GTR, LLS_DWS) all hauls are sampled, sampling is done per gear segment during hauling of the gear, and species number and length are collected but not weights.

d) Observation of PETS (Protected Endangered and Threatened Species) is also covered within the sampling scheme (along with quantification of PETS observation effort).

Within a sampled commercial fishing trip operating active metiers/gears (OTB_DEF, OTB_CRU, TBB_CRU, PS_SPF), PETS observation effort is the same as for other species - i.e. it is done in samples of the catch taken following the protocol described in topics a-c; and additionally in the opening of the net (OTB_DEF, OTB_CRU, TBB_CRU, PS_SPF) and in the hauling of the net (PS_SPF).

Within a sampled commercial fishing trip operating passive metiers/gears (GNS, GTR, LLS_DWS), PETS observation effort is the same as for other species - i.e. it is done during hauling of the gear following the protocol described in topics a-c.

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*, nº 57, 11 p + X Anexos.

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

Regional coordination: N.

Link to sampling design documentation: Fernandes, A. C.; Prista N.; Azevedo. M. (2017). Discards from the Portuguese bottom otter trawl operating in ICES Division 27.9.a (2004-2015). Relat.Cient.Tec. do IPMA (<http://ipma.pt>) n°18. 18p + Anexos

Compliance with international recommendations: Y. Sampling design in line with international recommendations, e.g. from ICES WGCATCH (Working Group on Commercial Catches).

Link to sampling protocol documentation: <https://www.ipma.pt/pt/publicacoes/pescas/index.jsp?page=rel.cientificos.12.xml> (reports 55, 56 and 57)

Sampling implementation

Recording of refusal rate: Y.

Monitoring of sampling progress within the sampling year: The number of PSU per trimester per sampling scheme executed versus planned is monitored monthly. When necessary and possible, the number of PSU planned but not executed (due to operational/logistical constraints) is rescheduled.

Data capture

Means of data capture: Biological data is collected with measuring board/tape/calliper (variable length) and scale (variable weight).

Data capture documentation: Documentation on quality of data capture is disclosed to all scientific observers and under constant improvement (e.g. species identification guides, age reading protocols, maturity stage guides, biological sampling protocols).

Quality checks documentation: Quality of data capture is checked yearly before response to data calls (e.g. unexpected species in a given metier/area, unexpected age for a given species length, unexpected maturity stage for a given species length, unexpected biological variable for a given species). This includes automatic and semi-automatic data quality checks procedures, at different stages (during and after data entry in the national database).

Data storage

National database: <http://nautilus.ipma.pt/>

International database: RDB/RDBES

Quality checks and data validation documentation: Quality of data storage is checked yearly before response to data calls (e.g. if all data captured is stored in the national database, including different levels of data such as level of fishing trip, haul, sample, individual, etc.). This includes automatic and semi-automatic data quality checks procedures, at different stages (during and after data entry in the national database).

Sample storage

Storage description:

Biological samples are stored at IPMA and a record of samples per species/stock by geographic sub-area is kept.

Hard tissues (otoliths and hard tissues for age reading) are stored until and after processing/analysis. Soft tissues (stomachs, gonads) are stored until processing/analysis.

Sample analysis:

Sample analysis follows national and international protocols (e.g. from WG and benchmark reports) for age reading, maturity stage, histology.

Data processing

Evaluation of data accuracy (bias and precision):

Bottom trawl fleet segments: Fernandes, A. C.; Prista N.; Azevedo. M. (2017). Discards from the Portuguese bottom otter trawl operating in ICES Division 27.9.a (2004-2015). Relat.Cient.Tec. do IPMA (<http://ipma.pt>) n°18. 18p + Anexos

Other fleet segments: Documentation will be developed in 2022-2024.

Editing and imputation methods:

Bottom trawl fleet segments: Fernandes, A. C.; Prista N.; Azevedo. M. (2017). Discards from the Portuguese bottom otter trawl operating in ICES Division 27.9.a (2004-2015). Relat.Cient.Tec. do IPMA (<http://ipma.pt>) n°18. 18p + Anexos

Other fleet segments: Documentation will be developed in 2022-2024.

Quality document associated to a dataset:

Bottom trawl fleet segments: Fernandes, A. C.; Prista N.; Azevedo. M. (2017). Discards from the Portuguese bottom otter trawl operating in ICES Division 27.9.a (2004-2015). Relat.Cient.Tec. do IPMA (<http://ipma.pt>) n°18. 18p + Anexos

Other fleet segments: Documentation will be developed in 2022-2024.

Validation of the final dataset: Data quality checks are carried out for trawl fleets (~metiers): a semi-automated quality assurance procedure was designed in R to detect errors and is run yearly before response to data calls and data analysis.

