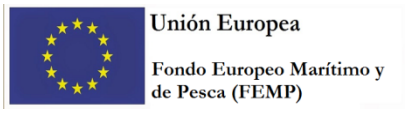

Ministerio de Agricultura, Pesca y Alimentación

Secretaría General de Pesca

Regulation (EU) 2017/1004 of the European Parliament and of the Council of 17 May 2017

on the establishment of a Union framework for the collection, management and use of data in the fisheries sector and support for scientific advice regarding the common fisheries policy and repealing Council Regulation (EC) No 199/2008 (recast).

Commission Delegated Decision (EU) 2021/1167 of 16 July 2021

establishing the multiannual Union programme for the collection and management of biological, environmental, technical and socioeconomic data in the fisheries and aquaculture sectors from 2022

Commission Implementing Decision (EU) 2021/1168 of 16 July 2021

establishing the list of mandatory research surveys at sea and thresholds as part of the multiannual Union programme for the collection and management of data in the fisheries and aquaculture sectors from 2022

Commission Implementing Decision (EU) 2021/39

laying down rules on the format and timetables for the submission of national work plans and annual reports on data collection in the fisheries and aquaculture sectors, and repealing Implementing Decisions (EU) 2016/1701 and (EU) 2018/1283

ANNEXES

Spain Annual Report on data collection in the fisheries and aquaculture sectors

2022

Version [2]

Madrid, 31-05-2023

CONTENTS

Madrid, 30-05-2023 2
ANNEX 1.1 - QUALITY REPORT FOR BIOLOGICAL DATA SAMPLING SCHEME 3
ESP_IEO_P1_AtSea 3
ESP_IEO_P1_OnShore 6
ESP_IEO_P1_Biological_Specific 8
ESP-AZTI_AtSea_ICES. 14
ESP-AZTI_AtSea_PET_ICES. 17
ESP-AZTI_OnShore_ICES. 20
ESP-AZTI_Biological_Specific 23
ESP_IEO_P2_AtSea 26
ESP_IEO_P2_OnShore 29
ESP_IEO_P2_StockSpecific 32
ESP_IEO_P2_Biological_Specific 35
ESP-IEO_P3_AtSea_Africa 39
ESP-IEO_P3_AtSea_Canarias 42
ESP-IEO_P3_OnShore 45
ESP-IEO_P3_OnShore_stock specific 48
ESP-IEO_P3_BioSpec 51
ESP_IEO_P4_AtSea_all 54
ESP_IEO_P4_OnShore_all 58
ESP_IEO_P4_OnShore_sp 61
ESP_IEO_P5_AtSea 64
ESP_IEO_P5_AtSea-CCAMLR 69
FCGS 73
PLATUXA_ESP 78
IBTS_Q4 (8c y 9a north) 83
IBTS_Q4 (9a south) 86
IBTS_Q4 (7ck) 89
IBWSS 92
MEGS (IEO) 96
MEGS (AZTI) 99
SAHMAS 102
SDEPM 105
BIOMAN. 109
ECOCADIZ_ESP 113
JUVENA_ESP 119
PALPRO_ESP 122
MEDIAS 125
MEDITS 128
UWTV30 131
IBTS_Q1 135
BOCADEVA 138
ECOCADIZ_RECLUTAS 144
BFT-Index 150
ESP-AZTI_OffSiteSurveysRecreational 154
SelfOnShore_recreational (off site surveys). 157
ANG_Anda_SciObs water body_Diadromous (scientific) 160
ANG_Astu_SciObs water body_Diadromous (commercial) 163
ANG_Astu_SciObs water body_Diadromous (market) 165
ANG_Astu_SciObs water body_Diadromous (scientific) 167
ANG_ Basq_SciObs water body_Diadromous (recreational) 169
ANG_ Basq_SciObs water body_Diadromous (scientific) 171

ANG_Cant_SciObs water body_Diadromous (commercial) 173
ANG_Cant_SciObs water body_Diadromous (scientific) 175
ANG_ Cat_SciObs water body_Diadromous (commercial)_GE_RWL 177
ANG_ Cat_SciObs water body_Diadromous (scientific)_GE_RWL 179
ANG_ Cat_SciObs water body_Diadromous (scientific)_S_EWL 181
ANG_ Cat_SciObs water body_Diadromous (scientific)_Y_SWL 183
ANG_Gali_SciObs water body_Diadromous (commercial) 185
ANG_Gali_SciObs water body_Diadromous (scientific) 187
ANG_Murc_SciObs water body_Diadromous (scientific) 189
ANG_Murc_SciObs water body_Diadromous (commercial) 191
ANG_Murc_SelfAtShore_Diadromous (commercial) 193
ANG_Nava_SciObs water body_Diadromous (scientific) 195
ANG_Vale_SciObs water body_Diadromous (commercial) 197
ANG_Vale_SciObs water body_Diadromous (scientific) 199
Saeatrout_Nava_SciObs water body_Diadromous (recreational) 201
Saeatrout_Nava_SciObs water body_Diadromous (scientific) 203
Seatrout_Gali_SciObs water body_Diadromous (scientific) 205
Salmon_Astu_SciObs water body_Diadromous (scientific) 207
Salmon_Basq_SciObs water body_Diadromous (scientific) 209
Salmon_Cant_SciObs water body_Diadromous (recreational) 211
Salmon_Cant_SciObs water body_Diadromous (scientific) 213
Salmon_Gali_SciObs water body_Diadromous (recreational) 215
Salmon_Gali_SciObs water body_Diadromous (scientific) 217
Salmon_Nava_SciObs water body_Diadromous (recreational) 219
Salmon_Nava_SciObs water body_Diadromous (scientific) 221
ANNEX 1.2 - Quality report for socioeconomic data sampling scheme 224
Fisheries. Probability sample survey 224
Fisheries. Census 230
Aquaculture. Stratified random sampling 232
Aquaculture. Census 238
Processing. Stratified random sampling 241
Processing. Census 244

ANNEX 1.1 - QUALITY REPORT FOR BIOLOGICAL DATA SAMPLING SCHEME

ESP_IEO_P1_AtSea

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS :ESP

Region: North-East Atlantic

Sampling scheme identifier: ESP_IEO_P1_AtSea

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):

Sampling scheme aiming at collecting discard volume and length samples from commercial catches at sea for all species listed in Table 1 of the EU MAP Delegated Decision annex.

Secondarily, information on incidental catches of sensitive species is also collected, as well as marine litter data. The sampling scheme covers métiers that use less selective fishing gear and are more likely to produce discards (selected in old pilot programs) within the Spanish (non-Basque) fleet operating in the Atlantic European waters (i.e. EEZ of UK, Ireland, France, Portugal and Spain in Subareas ICES 6, 7, 8 and 9).

Description of the population

Population targeted:

The population targeted is the fishing trips of the Spanish (non-Basque) trawlers and gillnetters operating in the Atlantic Spanish fishing grounds, as well as the purse seiners of the Gulf of Cadiz and the Spanish bottom otter trawlers targeting megrims in European non-Iberian Atlantic waters (mainly, ICES Subarea 7). The Spanish purse seiners of the Gulf of Cadiz have been included in this at-sea sampling program because of its difficulty to be sampled in port, rather than by presenting high levels of discards.

Population sampled:

The entire target population is susceptible to sampling, excluding the small-scale vessels without habitability for observers on board. Therefore, the sampling of gillnet métiers is focused on larger vessels, which target hake (using the fishing gear locally known as "volanta") and white anglerfish ("rasco"). However, all vessels of the trawl and purse seine métiers are susceptible to be sampled.

Stratification:

The sampled population is stratified in five technical strata (fleet/*métier*):

1. IEO_P1_S_CN_GNS: set gillnetters targeting hake and white anglerfish in the Cantabrian-Northwest fishing ground.
2. IEO_P1_S_CN_TB: bottom trawlers in the Cantabrian-Northwest fishing ground.
3. IEO_P1_S_GC_OTB: bottom otter trawlers of the Gulf of Cadiz fishing ground.
4. IEO_P1_S_GC_PS: purse seiners of the Gulf of Cadiz fishing ground.
5. IEO_P1_S_S7_OTB: bottom otter trawlers targeting megrims in ICES Subarea 7.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:

The vessel represents the Primary Sampling Unit (PSU), which are randomly selected from official lists of boats with fishing license, taking for sampling the fishing trip immediately following the phone call. For strata 1 to 4, the PSU selection is done by Simple Random Sampling With Replacement (SRSWR). For métier 5, the PSU selection is carried out directly by the fishery association for operational reasons, so it must be considered a Non-Probabilistic Quasi Simple Random Sampling Without Replacement (NPQSRSWOR).

In relation to the selection of fishing operations (hauls), all of them are sampled in the métiers of the national fishing grounds (Cantabrian-Northwest and Gulf of Cadiz) with daily trips (strata 1 to 4). However, métier 5, whose trips last 12 days on average, require alternating hauls for sampling.

All catch fractions available on board are considered in the sampling scheme.

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

Y

Regional coordination:

N

Link to sampling design documentation:

http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM)

Compliance with international recommendations:

Y

Link to sampling protocol documentation:

http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM)

Compliance with international recommendations:

Y

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

Y . http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM)

Monitoring of sampling progress within the sampling year:

Monthly monitoring of the coverage, adapting the sampling intensity when there are variations in fishing activity, so as to guarantee the quarterly robustness of the data.

AR comment: No deviations or developments.

Data capture

Means of data capture:

Lengths are collected with measuring board/tape for fish and cephalopods, and calliper for crustaceans. Weights are collected with dynamometers for crustaceans and cephalopods. Sampling data are registered by voice recording or written directly on the sampling sheets designed specifically for it. Subsequently, this information is computerized.

Data capture documentation:

http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM)

Quality checks documentation:

Y

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("*Seguimiento Informático de los Recursos Naturales Oceánicos*"(1) is the IEO fisheries and oceanographic Database. In relation to the former, this institutional Database serves as storage of primary and detailed fisheries sampling data, as well as a calculation tool to estimate aggregated scientific data.

International database:

RDB (Regional DataBase)

Quality checks and data validation documentation:

http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM)

(1): Translation: Integrated Monitoring of Oceanic Natural Resources

AR comment: No deviations or developments.

Sample storage

Storage description:

This sampling scheme doesn't produce samples to store.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM)

Editing and imputation methods:

http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM)

Quality document associated to a dataset:

http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM)

Validation of the final dataset:

The internal quality control process consist of four steps: 1) Supervision (monthly monitoring of the sampling coverage), 2) Verification (checking of the integrity of computerized data), 3) Matching (crossing the sampled trips with the official logbooks to assign the same trip ID), and 4) Validation (statistical analysis of a number of variables of the set of sampled

trips by weighting domain). The validation of the final dataset is made by applying the Cook's distance to the sampled discard volume and length distributions by species and *métier* for detection of possible outliers.
AR comment: No deviations or developments.

ESP_IEO_P1_OnShore

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS :ESP

Region: North-East Atlantic

Sampling scheme identifier: ESP_IEO_P1_OnShore

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at length samples from commercial landings on-shore for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers the Spanish (non-Basque) fishing fleet operating in the Atlantic European waters (i.e. EEZ of UK, Ireland, France, Portugal and Spain in Subareas 6, 7, 8 and 9).

Description of the population

Population targeted:
The Primary Sampling Unit (PSU) is the on-shore event, i.e. a combination of location and time (port*day).
The Spanish fleet of Atlantic European waters lands its catch in Atlantic national ports, as well as ports of other coastal countries.

Population sampled:
The main national ports, excluding the foreign ports, the minor national ports, as well as those ports whose logistics prevent a correct implementation of the sampling protocol. No sampling during the week-ends, when fishing activity is prohibited in Spain.

Stratification:
Population is stratified in 3 geographical fishing grounds with different fleets landing at their respective ports:

1. IEO_P1_M_CN: Spanish (non-Basque) fleet operating in the national fishing ground of Cantabrian-Northwest (17 major ports: A Coruña, Avilés, Burela, Cedeira, Celeiro, Fisterra, Gijón, Llanes, Luarca, Marín, Muros, Ribeira, San Vicente de la Barquera, Santander, Santoña, Suances and Vigo).
2. IEO_P1_M_GC: Spanish fleet operating in the national fishing ground of Gulf of Cadiz (5 major ports: Barbate, Isla Cristina, Rota, Sanlúcar de Barrameda and Tarifa).
3. IEO_P1_M_NEAFC: Spanish (non-Basque) fleet operating in the NEAFC European non-Spanish waters (6 major national ports: A Coruña, Avilés, Burela, Celeiro, Gijón and Vigo).

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The PSU selection is based on historical knowledge of the target fisheries, covering the main national ports (22 from 165 total ports, which host around 48% of the trips and 66% of the landings), trying to maintain a temporary periodicity throughout the year (generally weekly). Thus, the design of this sampling scheme has been defined as Non-Probabilistic Judgement Sampling (NPJS).
Then, the Secondary Sampling Unit (SSU), i.e. the landing event, is systematically selected prioritizing the main métiers requested by the ICES stock assessment WGs, whose landed species are sampled by commercial category under concurrent coverage.

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

Regional coordination:
N

Link to sampling design documentation:
http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM)

Compliance with international recommendations:
Y.
Link to sampling protocol documentation:
http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM
Compliance with international recommendations:
Y

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
Y.
http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM
Monitoring of sampling progress within the sampling year:
Monthly monitoring of the coverage, adapting the sampling intensity when variations in fishing activity occur, so as to guarantee the quarterly robustness of the scientific data.

AR comment: No deviations or developments.

Data capture

Means of data capture:
Lengths are collected with measuring board/tape for fish and cephalopods, and calliper for crustaceans. Sampling data are registered by voice recording or written directly on the sampling sheets designed specifically for it. Subsequently, this information is computerized.
Data capture documentation:
http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM
Quality checks documentation:
Y

AR comment: No deviations or developments.

Data storage

National database:
SIRENO ("*Seguimiento Informático de los Recursos Naturales Oceánicos*") is the IEO fisheries and oceanographic Database. In relation to the former, this institutional Database serves as storage of primary and detailed fisheries sampling data, as well as a calculation tool to estimate aggregated scientific data.
International database:
RDB (Regional DataBase)
Quality checks and data validation documentation:
http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM

AR comment: No deviations or developments.

Sample storage

Storage description:
This sampling scheme doesn't produce samples to store.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM
Editing and imputation methods:
http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM
Quality document associated to a dataset:
http://www.ieo.es/es_ES/web/ieo/pndb (section P1: Evaluación de recursos pesqueros en el área del ICES – CIEM
Validation of the final dataset:
The internal quality control process consist of four steps: 1) Supervision (monthly monitoring of the sampling coverage), 2) Verification (checking of the integrity of computerized data), 3) Matching (crossing the sampled trips with the official logbooks to assign the same trip ID), and 4) Validation (statistical analysis of a number of variables of the set of sampled trips by weighting domain). The validation of the final dataset is made by applying the Cook's distance to the sampled length distributions by species and métier for detection of possible outliers.

AR comment: No deviations or developments.

ESP_IEO_P1_Biological_Specific

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: ESP_IEO_P1_Biological_Specific

Sampling scheme type: Biological parameters specific

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):

Sampling scheme aiming at collecting biological samples (age, weight, sex and maturity variables) from commercial landings on-shore for next pelagic and demersal species included in Table 2.2 of the WP: *Engraulis encrasicolus, Micromesistius poutassou, Sardina pilchardus, Scomber scombrus, Scomber colias, Trachurus trachurus, Conger conger, Helicolenus dactylopterus, Lepidorhombus whiffiagonis, Lepidorhombus boscii, Loligo vulgaris, Lophius budegassa, Lophius piscatorius, Merluccius merluccius, Molva molva, Nephrops norvegicus, Octopus vulgaris, Pagellus bogaraveo, Parapenaeus longirostris, Phycis blennoides, Sepia officinalis and Trisopterus luscus.*

Description of the population

Population targeted.

The primary sampling unit (PSU) for each targeted species is the stock/Área/Frequency (see table in the Stratification section)

Population sampled:

The landed fraction of the target populations will be sampled periodically at the IEO laboratories, in order to cover the largest possible distribution area of each population. The samples will be obtained from the most important markets.

Stratification:

Population Targeted (Distribution Area)		Geographical strata for sampling	Frequency	N. PSUs
Engraulis encrasicolus	8	8.c.E / 8.c.W	Quarter	8
Engraulis encrasicolus	9, 10	9.a.N / 9.a.S	Quarter	8
Micromesistius poutassou	1-9, 12, 14	8.c + 9.a	Quarter	4
Sardina pilchardus	8c, 9a	8.c.E / 8.c.W / 9.a.N / 9.a.S	Quarter	16
Scomber scombrus	5, 6, 7, 8, 9	8.c.E / 8.c.W / 9.a.N	Quarter	12
Scomber colias	8, 9, 10	8.c.E / 8.c.W / 9.a.N / 9.a.S	Quarter	16
Trachurus trachurus	4a, 5b, 6a, 7a-c, 7e-k, 8	8.c.E / 8.c.W	Quarter	8
Trachurus trachurus	9a	9.a.N	Quarter	4
Conger conger	All areas	All areas	Year	1
Helicolenus dactylopterus	All areas	All areas	Year	1
Lepidorhombus boscii	8c, 9a	8.c (8.c.E+8.c.W) + 9.a	Quarter	4
Lepidorhombus whiffiagonis	7, 8abd	7	Quarter	4
Lepidorhombus whiffiagonis	8c, 9a	8.c (8.c.E+8.c.W) + 9.a	Quarter	4
Loligo vulgaris	All areas	9.a.S	Triennial	1
Lophius budegassa	7b-k, 8abd	7b-k	Quarter	4
Lophius budegassa	8c, 9a	8.c+9.a	Quarter	4
Lophius piscatorius	7, 8abd	7b-k	Quarter	4
Lophius piscatorius	8c, 9a	8.c + 9.a	Quarter	4
Merluccius merluccius	5b, 6, 7, 12, 14	7	Quarter	4
Merluccius merluccius	8c, 9, 10	8.c+9.a	Quarter	4
Molva molva	jun-14	7	Year	1
Nephrops norvegicus	9	9.a.S	Year	1

Octopus vulgaris	All areas	9.a.S	Triennial	1
Pagellus bogaraveo	9	9.a.S	Triennial	1
Parapenaeus longirostris		9.a.S	Triennial	1
Phycis blennoides	All areas	All areas	Year	1
Sepia officinalis	All areas	9.a.S	Triennial	1
Trisopterus luscus	All areas	9.a.N	Year	1

Table 1.- Distribution areas of the population targeted, geographical strata sampled in each one and the sampling frequency for each of these strata. The Number of PSUs is obtained by multiplying the number of strata by the Frequency.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:

The sampling allocation is opportunistic, in such a way that the samples of the stocks are obtained from the sellers, who in turn buy them in the most important fishing ports, which receive the landings of the selected geographic strata.

The sample/subsample is selected by 2 different methods depending on the species:

For the "pelagic" species group (*Engraulis encrasicolus, Micromesistius poutassou, Sardina pilchardus, Scomber scombrus, Scomber colias, Trachurus trachurus, Loligo vulgaris, Nephrops norvegicus, Octopus vulgaris, Parapenaeus longirostris* & *Sepia officinalis*), a Simple Random Sampling (SRS) is carried out from the landing boxes. The selected sample is entirely biologically analyzed (various biological variables are collected on each sampled fish until the expected number of samples is reached).

For the "demersal" species group (*Conger conger, Helicolenus dactylopterus, Lepidorhombus whiffiagonis, Lepidorhombus boscii, Lophius budegassa, Lophius piscatorius, Merluccius merluccius, Molva molva, Phycis blennoides, Pagellus bogaraveo* and *Trisopterus luscus*), a Simple Random Sampling (SRS) is applied for the selection of the samples in each length stratum. An attempt is made to select a fixed number of specimens of each length class for biological sampling, in such a way that various biological variables are collected from each individual. The sample attempts to represent the full length range of the landings, so the least abundant length classes are preferably selected for sampling.

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

N.

Regional coordination:

N.

Link to sampling design documentation:

There is currently no documentation available describing the design of this sampling scheme. However, it can be said that the sampling design in this case is defined by the target populations, the geographic strata and the temporal frequency, as shown in the table of the previous section: "stratification". Besides, the samplings of each geographic stratum and/or species are allocated to the IEO laboratories closest to the corresponding landing ports.

Sampled Geographical strata	IEO Sampling laboratories
ICES SubDivision 8.c.East	C.O. Santander
ICES SubDivision 8.c.West	C.O. Coruña
ICES SubDivision 9.a.North	C.O. Vigo
ICES SubDivision 9.a.South	C.O. Cádiz
ICES SubArea 7	C.O. Coruña & C.O. Vigo

Table 2.- Correspondence between the geographic fishing strata and the sampling laboratories

Compliance with international recommendations:

Y. Most of these species are evaluated by international groups of experts, and their recommendations are carried out. The sampling schemes are common into each of these two large "pelagic" and "demersal" groups.

Link to sampling protocol documentation:

There are sampling protocols for many of the demersal species in which the methodologies used in sampling, the storage and processing of data, and the processing and observation of skeletal parts (PE) for the allocation of age are described (Guía práctica para el estudio del crecimiento de species demersales en el Área ICES:http://www.repositorio.ieo.es/e-ieo/handle/10508/1755)

Age determination procedures from pelagic and benthic species from ICES Área in Spanish Institute of Oceanography (IEO) are also available at http://hdl.handle.net/10508/9858.

Compliance with international recommendations:

Y. Most of these species are evaluated by international groups of experts and follow the international workshops recommendations.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

NA. The fraction of the landing to be sampled is purchased from a vendor.

Monitoring of sampling progress within the sampling year:

It is intended that all the sampling strata are well represented, intensifying the samplings in the worst represented strata,

although this is not always possible.

AR comment: No deviations or developments.

Data capture

Means of data capture:

For most of the stocks, data from samplings are captured and registered written directly on the sampling sheets designed specifically for it and computerized to the IEO SIRENO database as soon as possible.

E. encrasicolus, *S. pilchardus* and *S. colias* data from the Gulf of Cádiz (9.a.S) are captured electronically with a tailored software/hardware system (icrOS) and data are subsequently uploaded to the IEO SIRENO database. The icrOS system simplest hardware setup comprises one or more sampling kiosks and a server connected in a local network. Each of those sampling kiosks is formed by a computer screen, a Raspberry Pi board, a waterproof keyboard and a mouse (**Figure 1**).

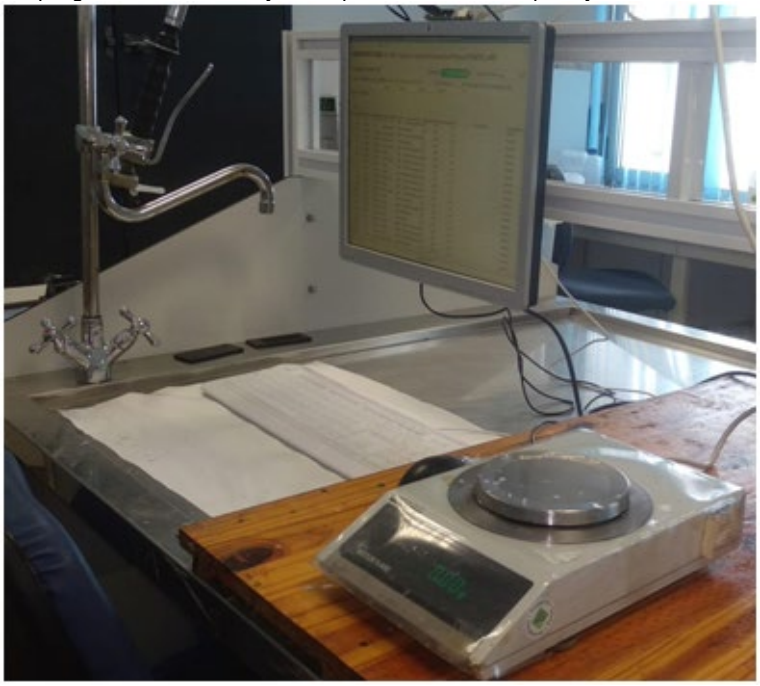

Figure 1. Typical icrOS sampling kiosk setup at IEO's Cádiz laboratory.

The server runs a PostgreSQL+PostGIS database where data from sampling is stored, a R-Shiny server for data quality checks and reports and a LTSP (Linux Terminal Server Project) which delivers the sampling software and applications to the sampling kiosks at boot time, easing the maintenance of the sampling software across the system.

Additional hardware such scales, GPS, echosounders, icrOS electronic measuring board, etc., can be connected to the system for data capture. In the case of scales, what is particularly recommended to reduce data errors due to bad weighing data recording, the system currently supports data capture from METTLER-TOLEDO, Marel and POLS scales. The icrOS electronic measuring board, however, is designed for sampling of length frequency distributions (LFD) and not for the biological sampling of the individual length measurement, despite it can be used as a conventional measuring board.

Label printers ZEBRA-ZPL2 language compatible can be connected to the system for printing specimen identification labels for labelling vials, etc. with a simple specimen code.

The sampling software consists in several applications for haul events data (position, time, depth...), catch sampling, LFD samplings and biological sampling. Biological sampling is performed using sampling protocols, defined before the sampling (**Figure 2**). For protocol definition, the user chooses the variables to be sampled (numerical for weight or length, categorical for keys, Boolean...) between a set of user defined variables and their sampling order, whether the variable value has a default value or not, if it can be locked (keep the value between specimens, useful when a given value, i.e., the same maturity appears across all the specimens). When the sampling starts, the sampling application reads the selected protocol (**Figure 3**), stored in the system database, and creates the user interface form for that protocol. This makes possible for the application to virtually sample any species (fishes, crustaceans...) if the proper protocol and variables have been defined for it.

The stages of the categorical variables (keys) are set at variable definition time. At sampling time, the user interface provides the user with drop-down lists for the categorical variables with that predefined stages, so the input of values not present in the keys is not possible, providing some extent of quality assurance to the system (**Figure 4**).

The sampling application can also be used for editing the values and samples previously input in case of error correction, and marking any individual variable of the sample as outlier/bad/invalid data is possible (i.e., after checking it is possible to mark as bad data only eviscerated weight for a particular sample, but the rest of the data remains valid).

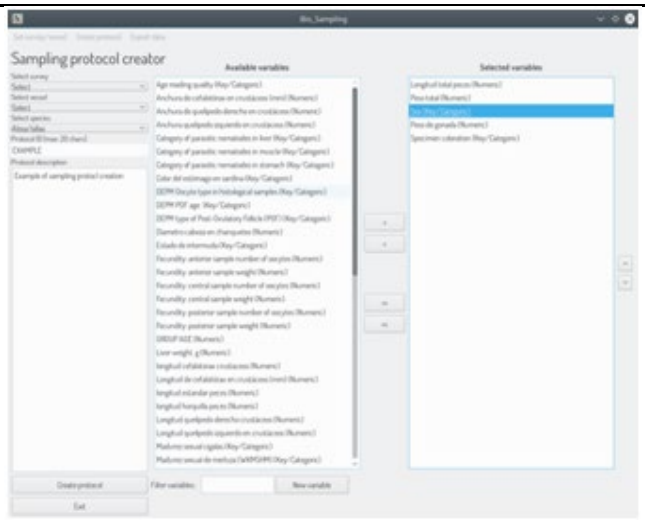

Figure 2. Sampling protocol creator.

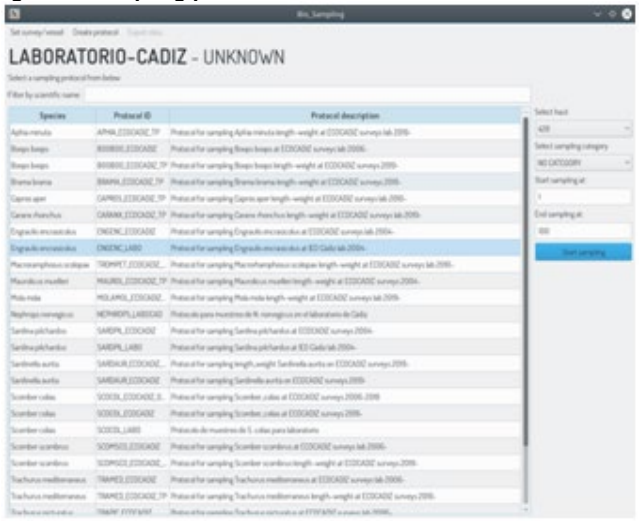

Figure 3. Selection of the sampling protocol.

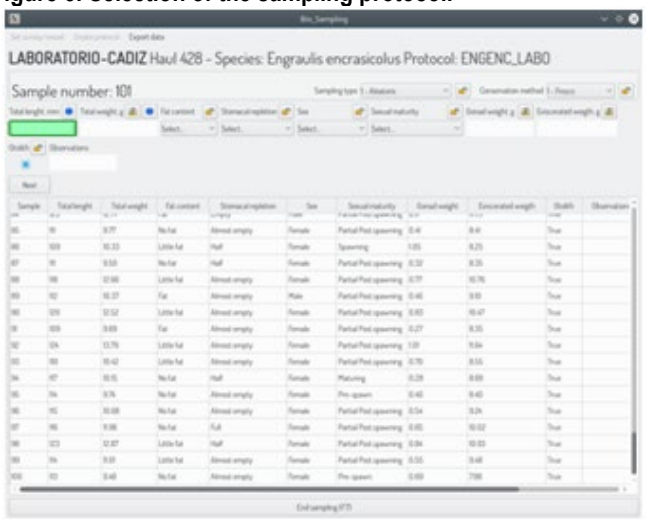

Figure 4. Biological sampling.

The system provides also applications for quality check, which are currently under development and also for data extraction and reporting. These applications are run in a R-Shiny server and can be accessed from any computer connected to the system network.

Data capture documentation:

Documentation on sampling templates, sampling equipment, maturity scales and ageing criteria in force is available within the sampling protocols (see the "Sampling design and protocols" section.

For the icrOS software/hardware system a first description of the system can be found at ICES WKSEATEC (Workshop on

Technical Development to Support Fisheries Data Collection) 2017 Report, pages 16-34 available at (https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2017/WKSEATEC/WKSEATEC%20report%202017.pdf). However, most recent description of the system can be found in the RCG NANSEA RCG Baltic 2021. Part I Report. 'New data sources and technology'. icrOS. Pgs 38-39. (https://datacollection.jrc.ec.europa.eu/docs/rcg).

Quality checks documentation:

No documentation targeting quality checks is available.

Analysis and detection of outliers for biological parameters, their weight–length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with (ggplot2 package), etc.

For small pelagic fish species sampled at IEO's lab at Cádiz, a R-Shiny application is used after sampling is complete for data checking. The application shows graphically the relationships between length, total, eviscerated and gonad weights, so outliers can be detected and corrected if necessary (**Figure 5**).

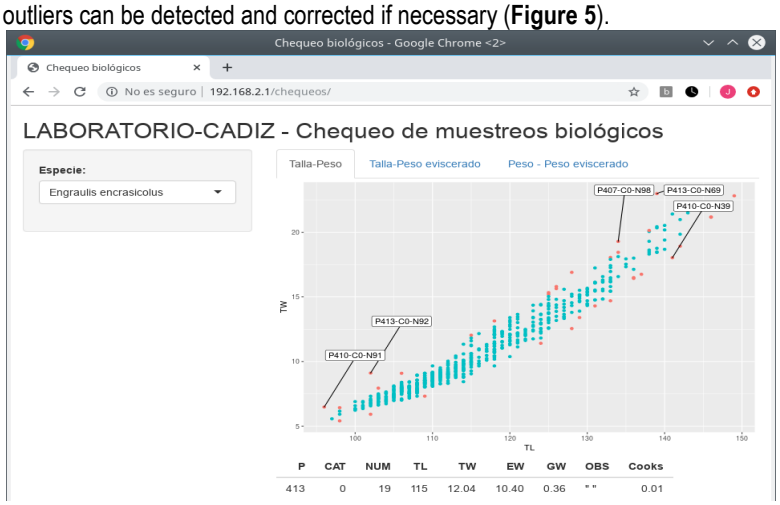

Figure 5. Application for data checking from biological sampling.

AR comment: No deviations or developments.

Data storage

National database:

SIRENO, the IEO database, is currently taking over the functions of the Spanish database, which has not yet finished development.

International database:

NA. Biological sampling data capture carried by the IEO populates the RDB and RDBES hosted by ICES. Age data is also sent to Intercatch for those species requested in the data call.

Quality checks and data validation documentation:

Our data recording system (SIRENO) has input masks that limit the entry of missing or anomalous values in specific fields. Specialized staff at the IEO carry out strict quality controls and data validations. All data stored in SIRENO, electronically or manually, must be validated. Although the information contained in the database remains visible through the application, each data set must be properly validated by a specific specialist, before being downloaded and sent to the end user.

In the case of using icrOS system (small pelagic species from 9a-S Gulf of Cadiz), the icrOS system doesn't allow the occurrence of missing values/zeros in those variables defined as mandatory , i.e., total length or total weight

AR comment: No deviations or developments.

Sample storage

Storage description:

The otoliths of almost all these species, after having been photographed for ageing, They are kept in envelopes or vials, these placed in boxes duly labelled and stored on the shelves of the growth warehouses of the IEO oceanographic centres where the samplings have been carried out: Coruña, Vigo, Santander and Cádiz. These pieces are stored systematically, without expiration date.

When the histological processing of the gonads is necessary to determine the sex or the state of sexual maturity of the specimens, as is the case of the conger eel, both the gonadal tissue samples included in paraffin blocks, as the slides with their respective histological sections, are also carefully kept and systematically stored in their respective places, where they remain indefinitely.

Sample analysis:

Sampling protocol for many of the demersal species in which the methodologies used in sampling, the storage and processing of data, and the processing and observation of skeletal parts (PE) for the allocation of age are described in sampling protocols (see the "Sampling design and protocols" section.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
The ageing data are obtained based on the agreement of two readers (pelagic and benthic species) and of three, in the case of demersal species. The quality assurance procedure is described in the sampling protocols (see the "Sampling design and protocols" section).

Editing and imputation methods:
Y. Depending on the error it could be tackled correcting the sample data (like some typing errors), while others are excluded from output/calculations or marked as outliers/errors.
Age length key (ALK) of the commercial sampling is completed with the age-length survey data and the missing values are completed by an age expert judgement. In addition, in the case of maturity of anchovy from the Gulf of Cádiz, for maturity ogives, missing maturity percentages are imputed from historical data.

Quality document associated to a dataset:
N.

Validation of the final dataset:
A tool developed by the IEO in R INBIO 2.0[1] (Estimation of biological parameters and their uncertainties by simulation techniques) is used to check the quality of the biological datasets. [*Sampedro, P., Sainza, M. and Trujillo, V.*, 2005. A simple tool to calculate biological parameters'uncertainty. Working Document, In: *Workshop on Sampling Desing for Fisheries Data* (WKSDFD), Pasajes, Spain.]. The methodologies used are:
Growth in age: von Bertalanffy, non-linear estimation by least squares (Gauss-Newton algorithm).
Size-weight ratio: non-linear estimation by least squares (Gauss-Newton algorithm).
Sex ratio: estimation of the global sex-ratio, it calculates the weighted coefficient of overall variation (weighted average of the coefficients of variation by size, being the number of individuals the weighting factor of each group) and the number of individuals used in the calculation.
Maturity (size and age): generalized linear model (GLM) with binomial errors and connection function: logistics function. Adjusting log-maximum likelihood.

AR comment: No deviations or developments.

ESP-AZTI_AtSea_ICES.

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: North-East Atlantic

Sampling scheme identifier: ESP-AZTI_AtSea_ICES

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):

Sampling scheme aiming at collecting length-weight information of discarded species at sea. All species that come onboard are sampled. AZTI oversees vessels based in the Basque Country (whereas the landing performed in other Spanish areas and by Spanish fleet are sampled by the IEO).

The aim of this sampling is to estimate discards at sea, including weight and length distribution of every captured species. The observed fleet includes trawlers, purse seine and small scale fisheries, according to predefined strata (see detailed description below).

Description of the population

Population targeted:

All fish species captured onboard are analysed for the estimation of total discard, as well as retained weight and length distribution. The primary sampling units (PSU) is vessel*week, and the secondary sampling unit (SSU) is the trip. The sampling frame is stratified based on strata (see Stratification below).

Population sampled:

Sampling is carried out in the Basque fleet including bottom otter trawlers, pair bottom trawlers, purse seiners, small scale fisheries (see Stratification section). Other fleet as trollers and hand lines for large pelagic fishes are excluded. As they are considered gears with very low discard.

Stratification:

At sea sampling is based on four different strata, predefined according to boat census and/or main fishing gear: (I) bottom otter trawlers; (II) pair bottom trawlers; (III) boats within the 'purse seine' census (including fishing activities by purse seine, hand lines during the mackerel season and trolling lines or live bait during the tuna season); and (IV) small scale fishery (i.e. artisanal fleet);

The temporal strata is the quarter, although equal monthly coverage is aimed.

AR comment No deviations or developments.

Sampling design and protocols

Sampling design description:

The sampling allocation is defined by a quasi-simple random sampling matrix with replacement, considering the vessel*week as the primary sampling unit. This sampling is considered for each quarter and with a random selection, a week is defined for a given vessel.

In the case of purse seiners, a similar method is used, but the sampling is carried out when the fleet is fishing in with this gear, and it varies from one year to another. The same vessel can be fishing with different gears along the gear and the period as purse seiner is limited in time. When they start with this modality the sampling starts, and the vessel*week selection is made in the same random method as others

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

The sampling has been designed to comply with the 4S principle as closer as possible.

Regional coordination:

A defined Regional Coordination procedure is expected in a near future. In this sense, many samplings follow common protocols in coordination within the RCG in the North Atlantic area, to coordinate all the samplings and avoid overlapping. Accordingly, sampling procedures follow the recommendations from the RCG-NANSEA, ICES WGCATCH and ICES-WKPICS. AZTI also participates in the subgroup of the Case Study of the trawl fishery in Iberian Waters.

Link to sampling design documentation:
No sampling design documentation.

Compliance with international recommendations:
Yes, the sampling design is in line with international recommendations (already commented above).

Link to sampling protocol documentation:
A preliminary draft containing a detailed sampling protocol is included in the following link (Protocolo_Arrastre_AZTI_2021.doc). The final document will be uploaded as soon as the remaining sections are completed.
https://azti.sharepoint.com/:w:/s/Proyectos/DatosPesqueriasAZTI/EeUXKmTajfpAi85rW8DkDc4BD4kXHMPmhNFC8AN5KSruyg?e=zKPoLm

Compliance with international recommendations:
Yes, the sampling protocol is in line with international recommendations (already commented above).

AR comment:
A new site gathering all sampling documentation has been developed: **https://www.azti.es/en/servicios/fisheries-sampling-programme/**

Sampling implementation

Recording of refusal rate:
Yes, refusals are recorded. When a survey can not be carried out or the sampling is not possible, the reason is written down and the sampling is moved to the next vessel in the list.

Monitoring of sampling progress within the sampling year:
Sampling coverage is continuously monitored and controlled, comparing the planned or expected sampling (based on the PSU sampling matrix) and the sampled units quarterly (i.e. every three months) throughout the year.

AR comment No deviations or developments.

Data capture

Means of data capture:
Fish length measurements are obtained with ichtyometers and weights with a hand scale. Lengths, as well as sampled weight, species, and total capture data are first recorded with a voice-recorder, and then introduced in an Excel sheet. From the Excel sheet it will be automatically uploaded to the AZTI database.

Data capture documentation:
Please see the sampling protocol named 'ProtocoloMuestreosPuerto_AZTI_draft1.pdf' in the following link:
https://azti.sharepoint.com/:w:/s/Proyectos/DatosPesqueriasAZTI/EeUXKmTajfpAi85rW8DkDc4BD4kXHMPmhNFC8AN5KSruyg?e=zKPoLm

Quality checks documentation:
Yes, automatic quality checks are applied when entering the data in the database.
Expert knowledge is used to detect errors, outliers, etc. and to compare different data sources with historical data.

AR comment:
A new site gathering all sampling documentation has been developed: **https://www.azti.es/en/servicios/fisheries-sampling-programme/**

Data storage

National database:
AZTI Fisheries Data Base

International database:
Data are sent to the RDB and the RDBES, as well as to INTERCATCH.

Quality checks and data validation documentation:
NA

AR comment: No deviations or developments.

Sample storage
Storage description: NA. **Sample analysis**: NA.
AR comment: No deviations or developments.
Data processing
Evaluation of data accuracy (bias and precision): There is not any evaluation documentation yet. Such documentation will be available as soon as Regional protocols are developed to calculate bias and precision on fish length distributions. **Editing and imputation methods:** Yes, imputation methods are used when required by the stock coordinator. In such cases, the nearest neighbour criteria is applied. **Quality document associated to a dataset:** NA. **Validation of the final dataset:** The final dataset is revised and compared with previous years, considering different data sources in order to check the quality of data, reduce bias, detect outliers, etc.
AR comment: No deviations or developments.

ESP-AZTI_AtSea_PET_ICES.

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: North-East Atlantic

Sampling scheme identifier: ESP-AZTI_AtSea_PET_ICES

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):

Sampling scheme aiming at collecting length-weight information of discarded species at sea. All species that come onboard are sampled. AZTI oversees vessels based in the Basque Country (whereas the landing performed in other Spanish areas and by Spanish fleet are sampled by the IEO).

The aim of this sampling is to estimate discards at sea, including weight and length distribution of every captured species. The observed fleet includes trawlers, purse seine and small scale fisheries, according to predefined strata (see detailed description below).

Description of the population

Population targeted:

Data on cetaceans and other megafauna bycatch is collected. The metier sampled is the PTB_8abd and the primary sampling units (PSU) is vessel*week.

Population sampled:

Sampling is carried out in the pair trawlers operating on ICES 8abd based on the Basque Country.

Stratification:

The sampling is carried out in the period that most cetacean bycatch occurs in the Bay of Biscay, from October to April. From October to December, one vessel*week is sampled monthly, whereas from January to April two vessel*weeks are sampled. The PSU is randomly selected for each month.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:

Allocation is defined by a quasi-simple random sampling matrix with replacement, considering the vessel*week as the primary sampling unit. This sampling is considered for each month and with a random selection, a week is defined for a given vessel.

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

The sampling has been designed to comply with the 4S principle as closer as possible.

Regional coordination:

The sampling design follows the best practice guidelines provided by ICES WKPICS 1,2,3 and WGCATCH expert groups.

Link to sampling design documentation:

No sampling design documentation.

Compliance with international recommendations:

Yes, the sampling design is in line with international recommendations.

Link to sampling protocol documentation:
A detailed sampling protocol is included in the following link (Protocolo PETs parejas.doc).

https://azti.sharepoint.com/:b:/s/Proyectos/DatosPesqueriasAZTI/EXRkjS7jCs5Akg6YORbJD-MBW-LuxmOlsopqtvwaDr4hGw?e=WHNKS7

Compliance with international recommendations:
Yes, the sampling protocol is in line with international recommendations.

AR comment:
A new site gathering all sampling documentation has been developed: **https://www.azti.es/en/servicios/fisheries-sampling-programme/**

Sampling implementation

Recording of refusal rate:
Yes, refusals are recorded. When a survey can not be carried out or the sampling is not possible, the reason is written down and the sampling is moved to the next vessel*week in the list.

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?
Sampling coverage is continuously monitored and controlled, comparing the planned or expected sampling (based on the PSU sampling matrix) and the sampled units monthly throughout the year.

AR comment: No deviations or developments.

Data capture

Means of data capture:
The most important phase to check during the fishing operation is the pre-sorting, period, once the codend is onboard. The observer is instructed to check in detail this part of the fishing operation. In addition, and once this checking is finished, the observer also checks the conveyor belt to identify any other rare species bycatch and is instructed to indicate the % of the observed period.

Data capture documentation:
Please see the sampling protocol named 'Protocolo PETs parejas.doc' in the following link:
https://azti.sharepoint.com/:b:/s/Proyectos/DatosPesqueriasAZTI/EXRkjS7jCs5Akg6YORbJD-MBW-LuxmOlsopqtvwaDr4hGw?e=WHNKS7

Quality checks documentation:
Yes, automatic quality checks are applied when entering the data in the database.

Expert knowledge is used to detect errors, outliers, etc. and to compare different data sources with historical data.

AR comment:
A new site gathering all sampling documentation has been developed: **https://www.azti.es/en/servicios/fisheries-sampling-programme/**

Data storage

National database:
AZTI Fisheries Data Base

International database:
Data are sent to the ICES WGBYC and WGMOMA..

Quality checks and data validation documentation:
NA

AR comment: No deviations or developments.

Sample storage

Storage description:
NA.

Sample analysis:

NA.
AR comment: No deviations or developments.
Data processing
Evaluation of data accuracy (bias and precision): There is not any evaluation documentation yet.. **Editing and imputation methods:** NA. **Quality document associated to a dataset:** NA. **Validation of the final dataset:** NA.
AR comment: No deviations or developments.

ESP-AZTI_OnShore_ICES.

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: North-East Atlantic

Sampling scheme identifier: ESP-AZTI_OnShore_ICES

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from 2022 until 2027

Short description (max 100 words):

Sampling scheme aiming at collecting length samples from commercial landings on-shore for species listed in Table 1 of the EU MAP Delegated Decision annex. AZTI oversees sampling fish landed in the Basque Country by the Basque fleet (whereas the landing performed in other Spanish areas and by Spanish fleet are sampled by the IEO).

The aim of this sampling is to estimate landings at length (i.e. length abundance distribution) of all the fish stocks targeted by the different types of commercial fishing fleet (i.e. trawlers, purse seine and small scale fisheries), according to predefined strata (see detailed description below).

Description of the population

Population targeted:

All fish species landed by the Basque fleet are considered for length sampling. The primary sampling units (PSU) are all port*days with landings. The secondary sampling unit (SSU) is the trip (i.e. the boat unloading fish that is sampled each day*port). The sampling frame is stratified based on strata (see Stratification below).

Population sampled:

Sampling is carried out in the main fishing ports of the Basque Country (mostly in Hondarribia, Pasaia, Getaria, Ondarroa, Lekeitio, Bermeo; and also in Lekeitio, Santurtzi and Armintza when small scale fisheries are sampled).

Basque fleet including bottom otter trawlers, pair bottom trawlers, purse seiners, small scale fisheries and polyvalent coastal fisheries are sampled (see Stratification section).

Sampling of paired bottom trawlers operating in areas VIIIa-b-d is limited to at-sea sampling observations. >24m longliners are out of our sampling frame. In the same way, ports with less activity that can get some landings throughout the year are not covered, since the sampling effort is focused on those ports with the highest fishing activity.

No sampling is carried out during the week-ends or holiday.

Stratification:

On-shore sampling is based on five different strata, predefined according to boat census and/or main fishing gear: (I) bottom otter trawlers; (II) pair bottom trawlers; (III) boats within the 'purse seine' census (including fishing activities by purse seine, hand lines during the mackerel season and trolling lines or live bait during the tuna season); (IV) small scale fishery (i.e. artisanal fleet); and (V) polyvalent coastal fishery, including vessels in census not included in previous strata.

The temporal strata is the quarter, although equal monthly coverage is aimed.

The predefined strata are mutually exclusive, since one boat cannot be included in more than one stratum at the same time.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:

The sampling allocation is defined by a quasi-simple random sampling matrix with replacement, considering the port*day as the primary sampling unit. In order to avoid bias on the sampling effort, samplers avoid repeating the sampling on the same boats (SSU) many times within each week, following a week*month-based scheme in which sampled boats are registered (see Sampling Design documentation). This way a special effort is made to get the sampling as random as possible.

Is the sampling design compliant with the 4S principle?:
The sampling has been designed to comply with the 4S principle as closer as possible.

Regional coordination:
A defined Regional Coordination procedure is expected in a near future. In this sense, many samplings follow common protocols in coordination within the RCG in the North Atlantic area, to coordinate all the samplings and avoid overlapping. Accordingly, sampling procedures follow the recommendations from the RCG-NANSEA, ICES WGCATCH and ICES-WKPICS. AZTI also participates in the subgroup of the Case Study of the trawl fishery in Iberian Waters.

Link to sampling design documentation:
A quasi random sampling matrix is used to chose the port*day (PSU) by each sampler (see Figure 1 in 'OnShoreSamplingDesignAZTI_PSU_SSU.pdf' document attached). The sampling effort allocation is based on the number of port*days with landings.
The secondary sampling unit (SSU) is the boat(s) or trip(s) sampled in each day*port. Repeating SSU within each sampling week is avoided with a sampling control scheme (Figure 2 in 'OnShoreSamplingDesignAZTI_PSU_SSU.pdf' document attached).
https://azti.sharepoint.com/:f:/s/Proyectos/DatosPesqueriasAZTI/Ep9FepREGoNFne6KrKyE994Bpfi_ZT0y9VhIrRoeZUB5YQ?e=T33h9K

Compliance with international recommendations:
Yes, the sampling design is in line with international recommendations (already commented above).

Link to sampling protocol documentation:
A preliminary draft containing a detailed sampling protocol is included in the following link (ProtocoloMuestreosPuerto_AZTI_draft1.pdf). The final document will be uploaded as soon as the remaining sections are completed.
https://azti.sharepoint.com/:f:/s/Proyectos/DatosPesqueriasAZTI/Ep9FepREGoNFne6KrKyE994Bpfi_ZT0y9VhIrRoeZUB5YQ?e=T33h9K

Compliance with international recommendations:
Yes, the sampling protocol is in line with international recommendations (already commented above).

AR comment:
A new site gathering all sampling documentation has been developed: **https://www.azti.es/en/servicios/fisheries-sampling-programme/**

Sampling implementation

Recording of refusal rate:
Yes, refusals are recorded.
Expected difficulties: each strata has its own particularities. In general: refusals, incomplete trips (due to landings sent to a processing industry, where the sampling is not possible), getting in advance information about whether landings will take place in the selected port (for small vessels), randomization of the vessel selection, etc.

Monitoring of sampling progress within the sampling year:
Sampling coverage is continuously monitored and controlled, comparing the planned or expected sampling (based on the PSU sampling matrix) and the sampled units quarterly (i.e. every three months) throughout the year.

AR comment: No deviations or developments.

Data capture

Means of data capture:
Fish length measurements are obtained with ichtyometers. Lengths, as well as sampled weight, species, and total capture data are first recorded with a voice-recorder, and then tranposed to the sample-sheets. All the collected sample-sheet data are transferred to the database every month.

Data capture documentation:
Please see the sampling protocol draft named 'ProtocoloMuestreosPuerto_AZTI_draft1.pdf' in the following link:
https://azti.sharepoint.com/:f:/s/Proyectos/DatosPesqueriasAZTI/Ep9FepREGoNFne6KrKyE994Bpfi_ZT0y9VhIrRoeZUB5YQ?e=T33h9K
See also the data introduction protocol, named 'ProtocoloIntroduccionDatos_AZTI_draft1.pdf', where the procedure of data transfer from sample sheets to the database is explained.

Quality checks documentation:
Yes, automatic quality checks are applied when entering the data in the database.
Expert knowledge is used to detect errors, outliers, etc. and to compare different data sources with historical data.

AR comment
A new site gathering all sampling documentation has been developed: **https://www.azti.es/en/servicios/fisheries-sampling-programme/**

Data storage

National database:
AZTI Fisheries Data Base

International database:
Data are sent to the RDB and the RDBES, as well as to INTERCATCH.

Quality checks and data validation documentation:
NA

AR comment: No deviations or developments.

Sample storage

Storage description:
NA

Sample analysis:
NA

AR comment No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
There is not any evaluation documentation yet. Such documentation will be available as soon as Regional protocols are developed to calculate bias and precision on fish length distributions.

Editing and imputation methods:
Yes, imputation methods are used when required by the stock coordinator. In such cases, the nearest neighbour criteria is applied.

Quality document associated to a dataset:
NA.

Validation of the final dataset:
The final dataset is revised and compared with previous years, considering different data sources in order to check the quality of data, reduce bias, detect outliers, etc.

AR comment: No deviations or developments.

ESP-AZTI_Biological_Specific

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: ESP_AZTI_Biological_Specific

Sampling scheme type: Biological parameters specific

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting biological samples (age, weight, sex and maturity) from commercial landings onshore for the next pelagic and demersal species included in Table 2.2 of the WP:
Engraulis encrasicolus, Sardina pilchardus, Scomber scombrus, Trachurus trachurus, Lepidorhombus whiffiagonis, Merluccius merluccius, Lophius budegassa, Lophius piscatorius.

Description of the population

Population targeted:
The population targeted is the following stocks into which the sampled species above are divided: ane.27.8, pil.27.8.abd, pil.27.8c9a, mac.27.nea, hom.27.2a4a5b6a7a-ce-k8, meg.27.7b-k8abd, hke.27.3a46-8abd, hke.27.8c9a, ank.27.78abd, ank.27.8c9a, mon.27.78abd, mon.27.8c9a.

Population sampled:
The available fraction of the target populations is the commercial landings at the main markets on the Basque Country; minor ports are not sampled.

Stratification:
Each target population is stratified by geographical lots, namely, 8.c.E, 8abd and 7, being this lots where Basque fleets mostly operate. Then each lot is stratified by time frame, i.e., month, quarter, semester, and year, and by the length class (link).

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The sampling allocation is opportunistic, in such a way that the samples of the stocks are obtained in those market which receive the most important landings of the selected strata (link). Mandatory biological parameters are obtained from a determinate number of individuals in the selected sample as required in the sampling scheme.

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

Regional coordination:
N

Link to sampling design documentation:
There is currently a matrix describing the design of this sampling scheme. It defines the number of individuals to be sampled per target population, geographic strata, and length class (link).

Compliance with international recommendations:
Y. Sampled species are evaluated by international groups of experts i.e., ICES WGBIOP and EGs referenced in the protocols (link).

Link to sampling protocol documentation:
Biological sampling protocols for all the species are available at the following link (link)

Compliance with international recommendations:
Y. Biological sampling protocols are updated according to the international workshops' recommendations i.e., ICES WGBIOP and EGs referenced in the protocols (link).

AR comment: No any deviations or developments. A new site gathering all sampling documentation has been developed: **https://www.azti.es/en/servicios/fisheries-sampling-programme/**

Sampling implementation

Recording of refusal rate:
NA. The fraction of the landing to be sampled is purchased from a vendor.

Monitoring of sampling progress within the sampling year:
Sampling for biological parameters is monitored quarterly, thus the degree of achievement of the sampling coverage objectives is always known and any deviation can be mitigated by intensifying the sampling in the required strata.

AR comment: No deviations or developments.

Data capture

Means of data capture:
Sampling data is firstly noted in the sampling sheet and thereafter imported into the internal database in about 1 month time (link). Date, fishing area and gear, total weight of the corresponding capture, and weight of the sample are registered along with the biological measurements in the sampling. Data capture is assisted by a variety of material, the same in all species: ichthyometer (length), analytical balance with 2 decimal places of accuracy (weight), international agreed maturity scales and ageing criteria and sex discrimination descriptions (link).

Data capture documentation:
Documentation on sampling templates, measurement equipment, maturity scales and ageing criteria in force is available within the sampling protocols (link).

Quality checks documentation:
N. There is an internal protocol detailing all the data check, but it is not ready to be shared.
Measuring equipment is calibrated (internal monitoring system for lab equipment) and the most updated maturity scales and ageing criteria are used (link). Technicians are trained accordingly both in internal and international exchanges.

AR comment:
A new site gathering all sampling documentation has been developed: **https://www.azti.es/en/servicios/fisheries-sampling-programme/**

Data storage

National database:
Biological sampling data capture carried by AZTI stored in AZTI Fisheries database and sent to IEO to populate SIRENO national database.

International database:
Biological sampling data capture carried by AZTI populates the RDB and RBDES hosted by ICES. Age data is also sent to Intercatch for those species requested in the data call

Quality checks and data validation documentation:
Automatic quality checks and validations are applied when entering the data in the database. The errors and gaps in data capture are checked with what it is registered in paper first, and then corrected in the database. If there is no possibility to correct it, the data is usually removed or replaced with average values/expert judgement. Data duplication is also checked. During the data quality process data captured is checked for outliers/non-realistic values in biological parameters along with spatial position and dates. For length data the graphs developed in FishPi are used. For the rest of biological parameters, the outlier is considered the observation out of the interquartile range. Data is then represented graphically with boxplots using R ggplot2 package and using expert judgement.

AR comment: No deviations or developments.

Sample storage

Storage description:
The otoliths of all these species mentioned above and illicii of monkfishes are stored dry according to all standards at our laboratory. Depending on the species they may be firstly processed (e.g., cutting, burning) before being conserved in Eukitte medium or envelopes in the corresponding place in the storeroom. They are stored without expiration date. The access to the stored samples is done using an internal application of samples reception and management (link). Information on quantities of sampled stored by species/stock, geographic sub-area and by year is available at link.

Sample analysis:
The sampling analysis is done according to the manuals (link) which are based on internationally agreed protocols that are the outputs from EGs.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
Y, the maturity assignment is evaluated by the percentage of agreement amount all readers on samples of 50 individuals. An internal calibration exercise is set up by species and year. The information we use are the EGs reports and workshops of international exchanges in which we also participate. The reference to them are in the protocols at link.
Ageing data is obtained based on the agreement of two readers. The information we use are the EGs reports and workshops of international exchanges in which we also participate. The references to them are in the protocols at link.
Additionally, we plan to compile all instructions in quality assurance protocols for the rest of biological parameters that will be developed during the present EU MAP exercise.

Editing and imputation methods:
Y. Missing information is filled using the nearest neighbour in case there is a small gap between unsampled sizes with respect to the observed size range. However, if the number of samples is very small, the ALK is complemented with other sources: sometimes from the surveys, other times from adjacent regions or adjacent periods.

Quality document associated to a dataset:
N.

Validation of the final dataset: How
Mentioned through the sections above all the quality checked steps to get a validated dataset to provide to the end user.

AR comment: No deviations or developments.

ESP_IEO_P2_AtSea

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: Mediterranean and Black Sea

Sampling scheme identifier: ESP_IEO_P2_AtSea

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting volume of discards and length samples from the catches (All fractions) at sea for all commercial species caught in the trip. When the observer has not the possibility of sample all species, he/she should priorize the species listed in Table 2.1 of the Spanish work plan covered by a commercial sampling scheme for length.

Description of the population

Population targeted:
The primary sampling unit (PSU) is all Spanish Mediterranean fishing trips of trawlers.

Population sampled:
List of vessels (trawlers) based in the most important ports in terms of landing and effort, which operate in the main areas of each sampling frame.

Stratification:
Four different strata are considered: GSA, metier, selected ports and time frame. For each GSA, metiers are non-probabilistic selected, based on the rules of the regional RFMO (GFCM). For each combination of GSA-metier-base port, the selection is according to previous knowledge which include their importance for each métiers (both in terms of biomass landed and effort as number of vessels) as well as their availability to carry out the sampling (predisposition and adequate facilities). Finally, the time frame (quarter or month) is set to force the sampling to cover the entire year.

Population targeted		subGeographical strata	N strata	Temporary strata
OTB_DEF_>=40_0_0	1, 5, 6, 7	E1, W1, Mall5, Meno5, S6, N6, 7	7	Quarter
OTB_DWS_>=40_0_0	1, 2, 5, 6, 7	1, 2, Mall5, Meno5, S6, N6, 7	7	Quarter

(the sampling frame OTB_DWS_>40_0_0 includes the OTB_DWS and OTB_MDD metier due to the imposibility to identify a priori the metier of the trip)

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The sampling frame is the list of vessel for each GSA or subGeographical strata and métier, with fishing trip as PSU. The trip to sample is selected by Simple Random Sampling as follows:
The list of vessel which operated in each GSA and métier and in the previous year would be available.
The list of vessels will be randomly ordered and vessels will be contacted in order as they appear in the list. Every unit is equally likely to be in the sample.
Results of the contact (no answer, refusal and reasons for refusals) will be tracked.
All catches will be concurrently sampled.

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

Regional coordination:
N

Link to sampling design documentation:
Sampling design: **MED1. Sampling plan description for biological data in the Spanish Mediterranean**

http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

Compliance with international recommendations:

Y

Link to sampling protocol documentation:

Sampling design: **MED1. Sampling plan description for biological data in the Spanish Mediterranean**

http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

Compliance with international recommendations:

N

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.

Y

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures during the sampling year?

When data records comes to laboratories, technical staff checks the data collected and, if there are some problems or mistakes, speaks with observers to explain the methodology and resolve possible doubts.

AR comment: No deviations or developments.

Data capture

Means of data capture:

All data of the trip (general data, position of hauls, faunistic list, length distributions of species in the catch) are captured and registered written directly on the sampling sheets designed specifically for it. The observer uses a recorder to collect the data on faunistic composition of catches and length distributions, and after the trip he/she transcribes the information to sampling sheets. Data are computerized to the IEO SIRENO database as soon as possible.

Weight of length samples are taken with an electronic dynamometer. Length measurements of fish and cephalopods are taken with ichtyometers, while calipers are used for crustaceans.

Data capture documentation:

Observers sampling protocol (handbook): **MED2. Manual de instrucciones para observadores a bordo**

http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

Measuring on board: http://www.fao.org/gfcm/data/dcrf

Quality checks documentation:

Y, not documented.

Documentation will be available at the end of 2022

Data exploration to investigate the errors committed during the sampling process such as:

Length distribution of a sample: checked with the comparison of SOP value and the sample weight value

Length distribution of the population: checked with the comparison of SOP value of the length distribution and the landing weight.

Detection of values out of range through graphs

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("Seguimiento Informático de los Recursos Naturales Oceánicos") is the IEO fisheries and oceanographic Database.

International database:

There is no specific international database.

Quality checks and data validation documentation:

Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length. All sampling information (métier, port, name of vessel, gear, name of species, commercial category...) must be selected from a dropdown.

The system compares the weight of the length sampling and the calculated weight with the length-weight relationship.

Handbook of IEO database: **MED3. Handbook SIRENO**

http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

AR comment: No deviations or developments.

Sample storage

Storage description:

This sampling scheme doesn't produce samples to store.

Sample analysis:

This sampling scheme doesn't produce samples.
AR comment: No deviations or developments.
Data processing
Evaluation of data accuracy (bias and precision): Y Data accuracy: **MED4. Spanish National Programme Quality Frame** Landing data processing and evaluation of data accuracy: **MED5: Raising of length of the landings** Discard data processing and evaluation of data accuracy: **MED6. Handbook_SIRENO_discards** http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo) **Editing and imputation methods:** N We hope to have available the Editing and Imputation documentation at the end of 2022. **Quality document associated to a dataset:** N **Validation of the final dataset:** The final length distribution of the population is checked with the comparison of SOP value of the length distribution and the landing weight for all sampling frames. Format is cheked with external tools (for example, DV Tool in the JRC webpage, platform to upload the Tasks in the GFCM-DCRF webpage)
AR comment: No deviations or developments.

ESP_IEO_P2_OnShore

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MS: ESP

Region: Mediterranean and Black Sea

Sampling scheme identifier: ESP_IEO_P2_OnShore

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting length samples from commercial landings on-shore for all commercial species caught in the trip. When the observer has not the posibility of sample all species, he/she should priorize the species listed in Table 2.1 of the Spanish work plan covered by a commercial sampling scheme for length.

Description of the population

Population targeted:
The primary sampling unit (PSU) is the on-shore event, i.e. a combination of location and time (port*day).

Population sampled:
Major ports for each sampling frame in terms of landings and effort for the selected métiers. Excluding all minor ports.

Stratification:
Four different strata are considered: GSA, metier, selected ports and time frame. For each GSA, metiers are non-probabilistic selected, based on the rules of the regional RFMO (GFCM). For each combination of GSA-metier, the ports to sample have previously been selected according to previous knowledge which include their importance for each métiers (both in terms of biomass landed and effort as number of vessels) as well as their availability to carry out the sampling (predisposition and adequate facilities). Finally, the time frame (quarter or month) is set to force the sampling to cover the entire year.

Population targeted		N Strata	Temporary strata
PS_SPF_>=14_0_0	GSAs 1, 5 and 6	3	Quarter
GTR_DEF_>=16_0_0	GSAs 1, 5 and 6	3	Quarter
LLS_DEF_0_0_0	GSAs 6 and 7	2	Quarter
FPO_DEF_0_0_0	GSAs 1 and 6	2	Quarter
LA_SLP_>=14_0_0	GSA 5	1	Quarter

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The PSU (port*day) selection is done by Non Probabilistic Judgement Sampling from a selection of 13 major national ports. The Secondary Sampling Units (SSU = landed trips) are systematically selected from the target métiers in each GSA as follows:

- For those métiers selected in each GSA to sample, in each selected ports, a vessel would be randomly selected (for example, the first vessel in the auction, or the first vessel at right or at left…). Then, in the same day or in the next day, the observer will select n'th subject from the list,
- Results of the contact (vessel sampled, refusal and reasons for refusals) will be tracked.
- All catches landed will be concurrently sampled.

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

Regional coordination:
N

Link to sampling design documentation:

Sampling desing: MED1. Sampling plan description for biological data in the Spanish Mediterranean
http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

Compliance with international recommendations:

Y

Link to sampling protocol documentation:

Sampling design: MED1. Sampling plan description for biological data in the Spanish Mediterranean
http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

Compliance with international recommendations:

N

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

Y

Monitoring of sampling progress within the sampling year:

When data records comes to laboratories, technical staf checks the data collected and, if there are some problems or mistakes, speaks with samplers to explain the methodology and resolve possible doubts.

AR comment: No deviations or developments.

Data capture

Means of data capture:

All data of the length sampling are captured and registered written directly on the sampling sheets designed specifically for it. Sometimes the sampler uses a recorder to collect the data, and after the visit of market he/she transcribes the information the sampling sheets. Data are computerized to the IEO SIRENO database as soon as possible.
Length measurements of fish and cephalopods are taken with measuring boards, while calipers are used for crustaceans.

Data capture documentation:

Onshore sampling protocol (hadbook): **MED7. Manual de instrucciones para muestreadores en lonja**.
http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)
Measuring protocols: http://www.fao.org/gfcm/data/dcrf

Quality checks documentation:

Y, not documented.
Documentation will be available at the end of 2022
Data exploration to investigate the errors committed during the sampling process such as:
Length distribution of a sample: checked with the comparison of SOP value and the sample weight value
Length distribution of the population: checked with the comparison of SOP value of the length distribution and the landing weight.
Detection of values out of range through graphs.

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("Seguimiento Informático de los Recursos Naturales Oceánicos") is the IEO fisheries and oceanographic Database.

International database:

There is no specific international database.

Quality checks and data validation documentation:

Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length. All sampling information (métier, port, name of vessel, gear, name of species, commercial category...) must be selected from a dropdown.
The system compares the weight of the length sampling and the calculated weight with the length-weight relationship.
Handbook of IEO database: **MED3. Handbook SIRENO**
http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

AR comment: No deviations or developments.

Sample storage

Storage description:
This sampling scheme doesn't produce samples to store.
Sample analysis:
This sampling scheme doesn't produce samples.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

Y
Data accuracy: **MED4. Spanish National Programme Quality Frame**
Landing data processing and evaluation of data accuracy: **MED5: Raising of length of the landings**
http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)
Editing and imputation methods:
N
We hope to have available the Editing and Imputation documentation at the end of 2022.
Quality document associated to a dataset:
N
Validation of the final dataset:
The final length distribution of the population is checked with the comparison of SOP value of the length distribution and the landing weight for all sampling frames.
Format is cheked with external tools (for example, DV Tool in the JRC webpage, platform to upload the Tasks in the GFCM-DCRF webpage)

AR comment: No deviations or developments.

ESP_IEO_P2_StockSpecific

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: Mediterranean and Black Sea

Sampling scheme identifier: ESP_IEO_P2_StockSpecific

Sampling scheme type: Commercial by category

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting length samples from commercial landings on-shore for selected commercial species landed in a port.

Description of the population

Population targeted:
The primary sampling unit (PSU) is the on-shore event, i.e. a combination of location and time (port*day).

Population sampled:
Major ports for each sampling frame in terms of landings and effort for the selected species/métier. Excluding all minor ports.

Stratification:
Four different strata are considered: GSA, metier, selected ports and time frame. For each GSA, metiers are non-probabilistic selected, based on the rules of the regional RFMO (GFCM). For each combination of GSA-metier, the ports to sample have previously been selected according to previous knowledge which include their importance for each métiers (both in terms of biomass landed and effort as number of vessels) as well as their availability to carry out the sampling (predisposition and adequate facilities). Finally, the time frame (quarter or month) is set to force the sampling to cover the entire year.

Population targeted		N Strata	Temporary strata
PS_SPF_>=14_0_0	GSAs 1, 5 and 6	3	Quarter
GTR_DEF_>=16_0_0	GSAs 1, 5 and 6	3	Quarter
LLS_DEF_0_0_0	GSAs 6 and 7	2	Quarter
FPO_DEF_0_0_0	GSAs 1 and 6	2	Quarter
LA_SLP_>=14_0_0	GSA 5	1	Quarter

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The PSU (port*day) selection is done by Non Probabilistic Judgement Sampling from a selection of 10 major national ports. The Secondary Sampling Units (SSU = boxes of the target species) are systematically selected from the target métiers in each GSA as follows:
For those species/métiers selected in each GSA to sample, in each selected ports, a box (or more) would be randomly selected (for example, the first box in the auction, or the first box at right or at left…).
Results of the contact (vessel sampled, refusal and reasons for refusals) will be tracked.
Samples should be large enough to allow to obtain a well defined mean.

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

Regional coordination:
N

Link to sampling design documentation:
Sampling desing: **MED1. Sampling plan description for biological data in the Spanish Mediterranean**

http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

Compliance with international recommendations:

Y

Link to sampling protocol documentation:

Sampling design: **MED1. Sampling plan description for biological data in the Spanish Mediterranean**
http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

Compliance with international recommendations:

N

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

Y

Monitoring of sampling progress within the sampling year:

When data records comes to laboratories, technical staf checks the data collected and, if there are some problems or mistakes, speaks with observers to explain the methodology and resolve possible doubts.

AR comment: No deviations or developments.

Data capture

Means of data capture:

All data of the length sampling are captured and registered written directly on the sampling sheets designed specifically for it. Sometimes the observer uses a recorder to collect the data, and after the visit of market he/she transcribes the information the sampling sheets. Data are computerized to the IEO SIRENO database as soon as possible.
Length measurements of fish and cephalopods are taken with measuring boards, while calipers are used for crustaceans.

Data capture documentation:

Onshore sampling protocol (hadbook): **MED7. Manual de instrucciones para muestreadores en lonja**.
http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)
Measuring protocols: http://www.fao.org/gfcm/data/dcrf

Quality checks documentation:

Y, not documented.
Documentation will be available at the end of 2022
Data exploration to investigate the errors committed during the sampling process such as:
Length distribution of a sample: checked with the comparison of SOP value and the sample weight value
Length distribution of the population: checked with the comparison of SOP value of the length distribution and the landing weight.
Detection of values out of range throught graphs

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("Seguimiento Informático de los Recursos Naturales Oceánicos") is the IEO fisheries and oceanographic Database.

International database:

There is no specific international database.

Quality checks and data validation documentation:.

Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length. All sampling information (métier, port, name of vessel, gear, name of species, commercial category...) must be selected from a dropdown.
The system compares the weight of the length sampling and the calculated weight with the length-weight relationship.
Handbook of IEO database: **MED3. Handbook SIRENO**
http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

AR comment: No deviations or developments.

Sample storage

Storage description:
This sampling scheme doesn't produce samples to store.
Sample analysis:
This sampling scheme doesn't produce samples.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

Y

Data accuracy: **MED4. Spanish National Programme Quality Frame**
Landing data processing and evaluation of data accuracy: **MED5: Raising of length of the landings**
http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)
Editing and imputation methods:
N
We hope to have available the Editing and Imputation documentation at the end of 2022
Quality document associated to a dataset:
N
Validation of the final dataset: How are datasets validated (quality checked) before providing to end-user?
The final length distribution of the population is checked with the comparison of SOP value of the length distribution and the landing weight for all sampling frames.
Format is cheked with external tools (for example, DV Tool in the JRC webpage, platform to upload the Tasks in the GFCM-DCRF webpage)

AR comment: No deviations or developments.

ESP_IEO_P2_Biological_Specific

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS:ESP

Region: Mediterranean and Black Sea

Sampling scheme identifier: ESP_IEO_P2_Biological_Specific

Sampling scheme type: Biological parameters specific

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):

Sampling scheme aiming at collecting biological samples (age, weight, sex and maturity variables) from commercial landings on-shore for next pelagic and demersal species included in Table 2.2 of the WP, and requiered by the GFCM: species Group 1: *Engraulis encrasicolus*, *Sardina pilchardus*, *Merluccius merluccius*, *Parapenaeus longirostris,* species Group 2: *Lophius budegassa*, *Micromesistius poutassou*, *Mullus surmuletus*, *Octopus vulgaris, Raja clavata, Scomber colias*, *Trachurus trachurus,* and other main species in the Spanish fisheries: *Aristeus antennatus, Mullus barbatus, Nephrops norvegicus* and *Trachurus mediterraneus.*

Description of the population

Population targeted:

The primary sampling unit (PSU) is the stock. The selection of stocks to sample has been made following the requeriments of the GFCM: individual information on sex and length at maturity would be mandatory for species belonging to Group 1 (Appendix A.1 of the GFCM-DCRF manual). The collection of this information is not compulsory for species G2 and G3, but countries are invited to provide them to.

Population sampled:

The landed fraction of the target populations will be sampled periodically at the IEO laboratories, in order to cover the largest possible distribution area of each population. The samples will be obtained from the most important markets.

The design has been done taking into account the representativeness of the data to collect with relation to the population (catches from the commercial fleet), considering that these data should be obtained cost-effectively and the information obtained can be used to estimate the population characteristics of interest precisely (low variability) and accurately (unbiased).

In general, species G1 will be sampled annually in all Spanish GSAs, while species G2 and the other main species in the Spanish fisheries will be sampled each three years in the more relevant GSA or GSAs.

Stratification:

Population targeted	Geographical stratas	N strata	Temporary strata
Engraulis encrasicolus	GSA1 and GSA6	2	Quaterly
Sardina pilchardus	GSA1 and GSA6	2	Quaterly
Scomber colias*	GSA1 and GSA6	2	Quaterly
Trachurus mediterraneus*	GSA1	1	Quaterly
Trachurus trachurus*	GSA1	1	Quaterly
Aristeus antennatus*	GSA5 and GSA6	2	Quaterly
Lophius budegassa*	GSA6	1	Quaterly
Merluccius merluccius	GSA1, GSA5 and GSA6	3	Quaterly
Micromesistius poutassou*	GSA6	1	Quaterly
Mullus barbatus	GSA1 and GSA6	2	Quaterly
Mullus surmuletus	GSA1, GSA5 and GSA6	3	Quaterly
Nephrops norvegicus	GSA1, GSA5 and GSA6	3	Quaterly
Octopus vulgaris*	GSA1	1	Quaterly

Parapenaeus longirostris	GSA1, GSA5 and GSA6	3	Quaterly
*Species wich sampling will be carried out once every three years			

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:

The sample/subsample is selected by a Simple Random Sampling (SRS) from landing boxes. In the laboratory, a fixed number of individuals by length class is selected in order to obtain the following information: individual length, weight, eviscerated weight, sex, maturity, gonad weight and, if applicable, the otolith or the structure to estimate the age of the individual every period (month, quarter or year).

In some crustacean species (*Nephrops norvegicus* and *Aristeus antennatus*), in which sex and maturity can be determinated without dissecting the individuals, part of the biological sampling will be done on board.

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

N

Regional coordination:

N

Link to sampling design documentation:

Working group on biological parameters (WGBIOP):
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2019/WGBIOP%202019.pdf

Compliance with international recommendations:

Yes. Almost all these species are evaluated by international groups of experts, and their recommendations are carried out. The sampling scheme is common to all of them.

Link to sampling protocol documentation:

Selection of species, and how to take the information of individual length, individual weight, sex, maturity, and collection of structures to determinate the age:
http://www.fao.org/gfcm/data/dcrf

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

NA. The fraction of the landing to be sampled is purchased from a vendor.

Monitoring of sampling progress within the sampling year:

It is intended that all the sampling strata are well represented, intensifying the samplings in the worst represented strata, although this is not always possible.

AR comment: No deviations or developments.

Data capture

Means of data capture:

For most of the stocks, data from samplings are captured and registered written directly on the sampling sheets designed specifically for it and computerized to the IEO SIRENO database as soon as possible.

Individual weight and gonad weight are taken with precision weight scales. Length measurements of fish and cephalopods are taken with ichthyometers, while calipers are used for crustaceans.

Maturity scales follow the agreements and recomendations of related workshops.

MATURITY DOCUMENTATION AND PROTOCOLS:

*Workshop on Sexual Maturity Sampling WKMAT; 2007. Including general rules and protocols for all groups of species:
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acfm/PGCCDBS/WKMAT07.pdf

*Report of the Workshop for Advancing Sexual Maturity Staging in Fish (WKASMSF): Include all the WKs and maturity scale by species so far:
https://www.ices.dk/community/Documents/WKASMSF%20Report%202018.pdf

*Report of the workshop on sexual maturity staging of mackerel and *horse mackerel* (WKMSMAC), 2007:
https://www.ices.dk/community/Documents/PGCCDBS/WKMSMAC_2007.pdf

*Report of the Workshop on Sexual Maturity Staging of Elasmobranchs (WKMSEL), 2010:
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2010/WKMSEL/WKMSEL%202010.pdf

* Report of the Workshop on Sexual Maturity Staging of Cephalopods (WKMSCEPH), 2010:
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2010/WKMSCEPH/WKMSCEPH%20Report.pdf

* Report of the Workshop on crustaceans (*Aristeus antennatus*, *Aristaeomorpha foliacea*, *Parapenaeus longirostris*, *Nephrops norvegicus*) maturity stages (WKMSC), 2009:
https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2009/WKMSC/WKMSC%202009.pdf

* Report of the Workshop on Small Pelagics (*Sardina pilchardus*, *Engraulis encrasicolus*) maturity stages (WKSPMAT), 2008: https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2008/WKSPMAT/wkspmat_2008.pdf

* Report of the workshop on sexual maturity staging of hake and monk (WKMSHM), 2007: https://www.ices.dk/community/Documents/PGCCDBS/WKMSHM_2007.pdf

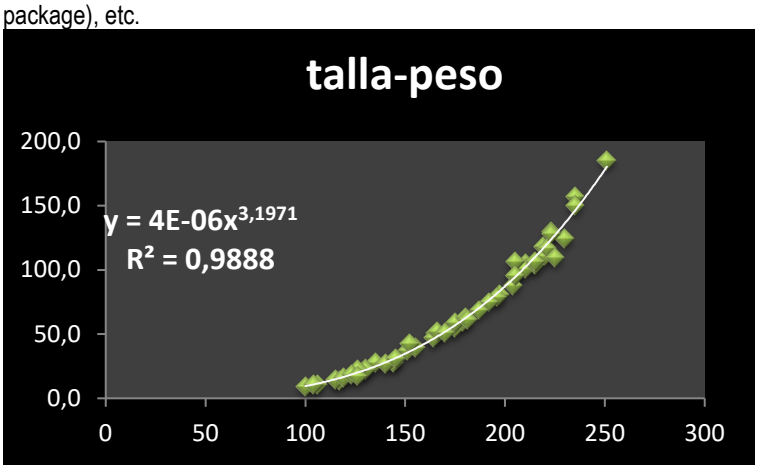
Data capture documentation:

Measuring protocols: GFCM Data Collection Reference Framework: http://www.fao.org/gfcm/data/dcrf

ICES WorkShops and WorkingGroups documents related to biological parameters and data quality assurance are storage in a repository: http://ices.dk/community/Pages/PGCCDBS-doc-repository.aspx

Quality checks documentation:

Analysis and detection of outliers for biological parameters, weight–length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with (ggplot2 package), etc.



Checks are usually carried out during and at the end of the sampling and also by analysing certain relationships between parameters.

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("Seguimiento Informático de los Recursos Naturales Oceánicos") is the IEO fisheries and oceanographic Database.

International database:

There is no specific international database.

Quality checks and data validation documentation:

Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length. All sampling information (port, species, name od vessel, gear, commercial category) must be selected from a dropdown.

Handbook of IEO database: **MED3. Handbook_SIRENO**

http://www.ieo.es/es_ES/web/ieo/pndb (section P2: Evaluación de recursos pesqueros en el Mediterráneo)

AR comment: No deviations or developments.

Sample storage

Storage description:

The otoliths of all these species, after having been photographed for aging, are stored in boxes duly labelled and stored on the shelves of the growth warehouses of the IEO oceanographic centres where the samplings have been carried out: Malaga, Murcia and Baleares. These pieces are stored systematically, without expiration date.

Sample analysis:

Otolith reading and age estimation follow the agreements and recomendations of related workshops

AGE ESTIMATION DOCUMENTATION AND PROTOCOLS:

*Workshop on Ageing Validation methodology of Mullus species (WKVALMU), 2017 https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2017/WKVALMU/01%20WKVALMU%20Report%202017.pdf

*Workshop on Age estimation of Blue Whiting (*Micromesistius poutassou*) WKARBLUE2, 2017: https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2017/WKARBLUE2/01%20WKARBLUE2%20Report%20of%20the%20Workshop%20on%20Age%20estimation%20of%20Blue%20Whiting%20(Microme

sistius%20poutassou)%20(WKARBLUE).pdf
*Report of the Workshop on Age estimation of European anchovy (*Engraulis encrasicolus*), 2016: https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2016/WKARA2/WKARA2%202016%20Report.pdf
*Report of the Workshop on Age reading of *Horse Mackerel*, Mediterranean Horse Mackerel and Blue Jack Mackerel (*Trachurus trachurus*, *T. Mediterraneus* and *T. picturatus*) (WKARHOM2), 2015: https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2015/WKARHOM2%20Report_01.pdf
*Report of the Workshop on Age Reading of Chub mackerel (*Scomber Colias*) (WKARCM), 2015: https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/SSGIEOM/2015/WKARCM%20Report%2001.pdf
*Report of the Workshop on Age Validation Studies of Gadoids (WKAVSG), 2013: https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKAVSG/WKAVSG%202013.pdf
*Workshop on age reading of european sardine (*Sardina pilchardus*) (NE Atlantic and Mediterranean) (WKARAS2), 2019: https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/EOSG/2019/WKARAS2%20Report%202019.pdf
*Anglerfish Illicia/Otoliths Ageing Workshop, 2011 https://www.ices.dk/community/Documents/PGCCDBS/Anglerfish%20(Lophius%20piscaorius)%20illicia%20and%20otoliths%20exchange%202011_.pdf
For more information ICES WorkShops and WorkingGroups documents related to biological parameters and data quality assurance are storage in a repository: http://ices.dk/community/Pages/PGCCDBS-doc-repository.aspx

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
Y
The estimation of the biological parameters and their uncertainties is to be carried out using the tool INBIO 2.0 ("Estimation of biological parameters and their uncertainties through simulation techniques"), developed in R environment by the IEO. INBIO makes possible to fit the most usual models and to estimate the coefficient of variation for parameters by using the non-parametric bootstrap methodology.
Sampedro P., Saínza M., Trujillo V. 2005. A simple tool to calculate biological parameter's uncertainty. Working Document in Workshop on Sampling Design for Fisheries Data. ICES CM 2005/ACFM:11, Pasajes (Spain), 82 pp.

Editing and imputation methods:
Y. Depending on the error it could be tackled correcting the sample data (like some typing errors), while others are excluded from output/calculations or marked as outliers/errors.
Age length key (ALK) of the commercial sampling is completed with the age-length survey data and the missing values are completed by an age expert judgement.

Quality document associated to a dataset:
N

Validation of the final dataset:
A tool developed by the IEO in R INBIO 2.0[1] (Estimation of biological parameters and their uncertainties by simulation techniques) is used to check the quality of the biological datasets. [*Sampedro, P., Sainza, M. and Trujillo, V.*, 2005. A simple tool to calculate biological parameters'uncertainty. Working Document, In: *Workshop on Sampling Desing for Fisheries Data* (WKSDFD), Pasajes, Spain.]. The methodologies used are:
Growth in age: von Bertalanffy, non-linear estimation by least squares (Gauss-Newton algorithm).
Size-weight ratio: non-linear estimation by least squares (Gauss-Newton algorithm).
Sex ratio: estimation of the global sex-ratio, it calculates the weighted coefficient of overall variation (weighted average of the coefficients of variation by size, being the number of individuals the weighting factor of each group) and the number of individuals used in the calculation.
Maturity (size and age): generalized linear model (GLM) with binomial errors and connection function: logistics function. Adjusting log-maximum likelihood.

AR comment: No deviations or developments.

ESP-IEO_P3_AtSea_Africa

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: Other regions

Sampling scheme identifier: ESP-IEO_P3_AtSea_Africa

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting length and biological variables samples for the species listed in Table 1 of the EU MAP Delegated Decision, from at sea observations in NW Africa under Sustainable Fisheries Partnership Agreements (SFPAs).

Description of the population

Population targeted:
The primary sampling unit (PSU) is vessel*trip of bottom trawlers in NW Africa under SFPAs targeting shrimps, black hake and mix cephalopods and finfish.

Population sampled:
The entire target population is susceptible to sampling.
Sampling coverage in these areas highly depends on the signature of the SFPAs between the EU and coastal States. In all cases, in sampling at sea schemes, difficulties might be expected, related to the collaboration of the fishing sector to have observers onboard. The degree of collaboration has been varying in the past, depending on the type of fleet and their specific circumstances (limited space onboard, uncertainty of the fishing activity in response of changing protocol measures, etc.).

Stratification:
The information is broken down by technical criteria (métier):

- OTB_CRU_>=40_0_0 (freezer bottom shrimper trawlers)
- OTB_DEF_>=70_0_0 (bottom trawlers targeting black hake)
- OTB_MCF_>=70_0_0 (freezer trawlers targeting mix cephalopods and finfish)

Sampling coverage in these areas highly depends on the varying circumstances of the Protocols of the SFPAs between the EU and coastal States. These can involve changes in the fisheries conditions and accessibility or even the closure of certain fisheries or the introduction of new fisheries to be sampled. As a consequence, some of the planned objectives for 2022-2027 would not be adequately achieved or some new métiers could be added to sampling scheme in the future.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
PSUs (vessel*trip) are selected either by the ship-owners association, trying to follow a rotation system (one vessel per fishing trip), allowing 100% coverage of the target population, nor opportunistically. In all cases, in sampling at sea schemes, difficulties might be expected, related to the collaboration of the fishing sector to have observers onboard. The degree of collaboration has been varying in the past, depending on the type of fleet and their specific circumstances (limited space onboard, uncertainty of the fishing activity in response of changing protocol measures, etc.).

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

Regional coordination:
N

Link to sampling design documentation:
All relevant information can be found in the Scientific Observation Manuals written by the scientific staff supervising the

fisheries in NW Africa (internal reports). All this documentation can be reviewed at: http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Compliance with international recommendations:

Y

Link to sampling protocol documentation:

All relevant information can be found in the Scientific Observation Manuals written by the scientific staff supervising the fisheries in NW Africa (internal reports). All this documentation can be reviewed at: http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Compliance with international recommendations:

Y

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

Y

Monitoring of sampling progress within the sampling year:

Along the year a monitoring of the coverage is carried out, adapting the sampling intensity when there are variations in fishing activity.

Sampling schemes are designed to collect the best data and information need for the assessment purposes required by CECAF. Any deviation are due to SFPAs, which are reasons that cannot be attributed to sampling intensity or methods used for collecting data and for estimating the parameters, therefore it is not feasible to adopt any mitigation measures.

AR comment: No deviations or developments.

Data capture

Means of data capture:

Lengths are collected with measuring board/tape for fish and cephalopods, and calliper for crustaceans Weights are collected with marine scales.

The data are recording or written directly on the sampling sheets designed specifically for it and the information is computerized as soon as possible.

Data capture documentation:

Specific sampling requirements are given in several scientific observation manuals which comprise observation guidelines and reference materials. All this documentation can be reviewed at: http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Quality checks documentation:

N. Biological data is checked at the laboratory in order to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases ad hoc.

AR comment: No deviations or developments.

Data storage

National database:

All data are stored in the IEO data base (SIRENO, currently as national database), processed and analyzed by the IEO scientists to be used in the CECAF assessment WGs and/or Joint Scientific Committees of SFPAs, following the requirements of these data by end-users.

International database:

Data are uploaded at The Regional Data Base (RDB) hosted and maintained by ICES.

Quality checks and data validation documentation:

Documents on quality checks are currently at the preparation stage.

Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length. All sampling information (métier, name of vessel, gear, name of species,...) must be selected from a dropdown.

Data sets, apart from SIRENO storage and processing, are also explored and checked by IEO scientific staff to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases ad hoc.

AR comment: No deviations or developments.

Sample storage

Storage description:

This sampling scheme doesn't produce samples to store.

Sample analysis:

This sampling scheme doesn't produce samples. No tissues are taken (age structures, stomach, plankton or genetics). CECAF does not carry out age-based assessments.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N. Documentation on processes to evaluate accuracy is still ongoing (not yet finalized).

Editing and imputation methods:
N. Documentation is still ongoing (not yet finalized).
Quality document associated to a dataset:
N. Documentation on processes to evaluate quality is still ongoing (not yet finalized).
Validation of the final dataset:
Sampling levels and data quality are considered adequate, based on experience and DCF requirements, following quality levels (CV in previous technical reports), and the agreements achieved in the RCGs meetings. Documentation of the quality assurance framework is in progress and not available yet.

AR comment: No deviations or developments.

ESP-IEO_P3_AtSea_Canarias

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: Outermost regions

Sampling scheme identifier: ESP-IEO_P3_AtSea_Canarias

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting length samples for the species listed in Table 1 of the EU MAP Delegated Decision, from at sea observations in Canary fishing grounds.

Description of the population

Population targeted:
The primary sampling unit (PSU) is vessel*trip of artisanal fleet targeting both, small pelagics and demersal species in Tenerife and Gran Canaria.

Population sampled
The entire target population is susceptible to sampling.
In all cases, in sampling at sea schemes, difficulties might be expected, related to the collaboration of the fishing sector to have observers onboard. The degree of collaboration has been varying in the past, depending on the type of fleet and their specific circumstances (e.g. limited space onboard, legal capacity to admit non-crew personnel).

Stratification:
The information is broken down by technical criteria (métier):

- PS_SPF_10_0_0 (artisanal purse seiners targeting small pelagics).
- MIS_DES_0_0_0 (artisanal polyvalent and multi-specific fleet targeting demersal species with small gears (traps, hooks, nets).

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
PSUs (vessel*trip) are selected *ad-hoc* covering representative "type vessels" operating in the islands (Tenerife and Gran Canaria). In all cases, in sampling at sea schemes, difficulties might be expected, related to the collaboration of the fishing sector to have observers onboard. The degree of collaboration has been varying in the past, depending on the type of fleet and their specific circumstances (e.g. limited space onboard, legal capacity to admit non-crew personnel).

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

Regional coordination:
N

Link to sampling design documentation:
All relevant information can be found in the Scientific Observation Manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Compliance with international recommendations:
Y

Link to sampling protocol documentation:
All relevant information can be found in the Scientific Observation Manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Compliance with international recommendations:
Y

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
Y

Monitoring of sampling progress within the sampling year:
Monthly monitoring of the coverage, adapting the sampling intensity when there are variations in fishing activity, so as to guarantee the robustness of the data

Sampling schemes are designed to collect the best data and information need for the assessment purposes required by CECAF. Any deviations are due to collaboration of the sector, which are reasons that cannot be attributed to sampling intensity or methods used for collecting data.

AR comment: No deviations or developments.

Data capture

Means of data capture:
Lengths are collected with measuring board/tape for fish and cephalopods, and calliper for crustaceans Weights are collected with precision marine scales.

The data are recording or written directly on the sampling sheets designed specifically for it and the information is computerized as soon as possible.

Data capture documentation:
Specific sampling requirements are given in several scientific observation manuals which comprise observation guidelines and reference materials. All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Quality checks documentation:
N. Biological data is checked at the laboratory in order to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases ad hoc.

AR comment: No deviations or developments.

Data storage

National database:
All data are stored in the IEO data base (SIRENO, currently as national database), processed and analyzed by the IEO scientists to be used in the CECAF assessment WGs and/or Joint Scientific Committees of SFPAs, following the requirements of these data by end-users.

International database:
Data are uploaded at The Regional Data Base (RDB) hosted and maintained by ICES.

Quality checks and data validation documentation:
Documents on quality checks are currently at the preparation stage.

Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length. All sampling information (métier, name of vessel, gear, name of species,...) must be selected from a dropdown.

Data sets, apart from SIRENO storage and processing, are also explored and checked by IEO scientific staff to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases ad hoc.

AR comment: No deviations or developments.

Sample storage

Storage description:
This sampling scheme doesn't produce samples to store.

Sample analysis:
This sampling scheme doesn't produce samples No tissues are taken (age structures, stomach, plankton or genetics). CECAF does not carry out age-based assessments.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
N. Documentation on processes to evaluate accuracy is still ongoing (not yet finalized).

Editing and imputation methods:
N. Documentation is still ongoing (not yet finalized).

Quality document associated to a dataset:
N. Documentation on processes to evaluate quality is still ongoing (not yet finalized).

Validation of the final dataset:
Sampling levels and data quality are considered adequate, based on experience and DCF requirements, following quality levels (CV in previous technical reports), and the agreements achieved in the RCGs meetings. Documentation of the quality assurance framework is in progress and not available yet.

AR comment: No deviations or developments.

ESP-IEO_P3_OnShore

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: Other regions & Outermost regions

Sampling scheme identifier: ESP-IEO_P3_OnShore

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting length samples from commercial landings on-shore for the species listed in Table 1 of the EU MAP Delegated Decision. The scheme covers the Spanish fleet operating under Sustainable Fisheries Partnership Agreements (SFPAs) and the fleet operating in the EU waters of Canary Island (outermost regions).

Description of the population

Population targeted:
The primary sampling unit (PSU) is the on-shore event, i.e. a combination of location and time (port*day).

Population sampled:
Population sampled is the main ports where the mentioned fleets land.

Stratification:
Population is stratified in several lots. Then the landed trips are selected by technical criteria (métier):

- Port of Barbate: hosting a 100% of landings in Spain from SFPAs (PS_SPF_0_0_0).
- Port of Cádiz: hosting a 98% of fresh fish trawlers from SFPAs (OTB_DEF_>=70_0_0).
- Port of Vigo: hosting a 100% of landings in Spain from SFPAs (LLS_DEF_0_0_0).
- Ports from Canary Islands, covering 70% and 100% of the landing from PS_SPF_10_0_0 and MIS_DES_0_0_0, respectively.

Circumstances related to the Protocol regulations, management measures in the Spanish fishing ground (closed seasons, TACs) or the abundance of the stocks in one fishing ground or another may affect the activity of the fleet.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The PSU selection is based on historical knowledge of the target fisheries, covering the main landing ports of the fleets considered.
The selection of the sampling day is not random, but depends on the availability of trips landed in port according to the seasonality of the fisheries and the fishing strategy of the metiers. Therefore, the method of selecting on-shore events for sampling is defined as Non-Probabilistic Judgement Sampling ("NPJS").
All fractions of landings are considered. The secondary sampling unit (SSU) is the trip landed from the métiers considered and it is selected randomly.

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

Regional coordination:
N

Link to sampling design documentation:
All relevant information can be found in the sampling manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Compliance with international recommendations:
Y

Link to sampling protocol documentation:
All relevant information can be found in the sampling manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)
Compliance with international recommendations:
Y

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
Y
Monitoring of sampling progress within the sampling year:
Y. Monthly monitoring of data collected from the samplers. In the IEO laboratories, technical staff checks the data collected and, if there are some problems or mistakes, speaks with samplers to solve possible doubts.

AR comment: No deviations or developments.

Data capture

Means of data capture:
Length measurements of fish and cephalopods are taken with measuring boards, while calipers are used for crustaceans.
All data of the length sampling are captured and registered written directly on the sampling sheets designed specifically for it. Sometimes the sampler uses a recorder to collect the data, and after the visit of market he/she transcribes the information the sampling sheets. Data are computerized to the IEO SIRENO database as soon as posible.
Data capture documentation:
All relevant information can be found in the sampling manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)
Quality checks documentation:
N. Biological data is checked at the laboratory in order to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases *ad hoc.*

AR comment: No deviations or developments.

Data storage

National database:
All data are stored in the IEO data base (SIRENO, currently as national database), processed and analyzed by the IEO scientists to be used in the CECAF assessment WGs and/or Joint Scientific Committees of SFPAs, following the requirements of these data by end-users.
International database:
Data are uploaded at The Regional Data Base (RDB) hosted and maintained by ICES.
Quality checks and data validation documentation:
Documents on quality checks are currently at the preparation stage.
Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length. All sampling information (métier, port, name of vessel, gear, name of species, commercial category...) must be selected from a dropdown.
The system compares the weight of the length sampling and the calculated weight with the length-weight relationship.
Data sets, apart from SIRENO storage and processing, are also explored and checked by IEO scientific staff to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases *ad hoc*.

AR comment: No deviations or developments.

Sample storage

Storage description:
This sampling scheme doesn't produce samples to store.
Sample analysis:
This sampling scheme doesn't produce samples. No tissues are taken (age structures, stomach, plankton or genetics). CECAF does not carry out age-based assessments

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
N. Documentation on processes to evaluate accuracy is still ongoing (not yet finalized).
Editing and imputation methods:
N. Documentation is still ongoing (not yet finalized).
Quality document associated to a dataset:
N. Documentation on processes to evaluate quality is still ongoing (not yet finalized).
Validation of the final dataset:

Sampling levels and data quality are considered adequate, based on experience and DCF requirements, following quality levels (CV in previous technical reports), and the agreements achieved in the RCGs meetings. Documentation of the quality assurance framework is in progress and not available yet.
AR comment: No deviations or developments.

ESP-IEO_P3_OnShore_stock specific

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: Other regions & Outermost regions

Sampling scheme identifier: ESP-IEO_P3_OnShore_stock specific

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting length samples from commercial landings on-shore for selected commercial species landed in a port. The scheme covers the Spanish fleet operating under Sustainable Fisheries Partnership Agreements (SFPAs) and the fleet operating in the EU waters of Canary Island (outermost regions).

Description of the population

Population targeted:
The primary sampling unit (PSU) is the on-shore event, i.e. a combination of location and time (port*day).

Population sampled:
Population sampled is the main ports where the mentioned fleets land.

Stratification:
Population is stratified in several lots. Then the landed trips are selected by technical criteria (métier):

- Port of Barbate: hosting a 100% of landings in Spain from SFPAs (PS_SPF_0_0_0).
- Port of Cádiz: hosting a 98% of fresh fish trawlers from SFPAs (OTB_DEF_>=70_0_0).
- Ports of Tenerife: covering 70% of the landing (PS_SPF_10_0_0).
- Ports of The Canary Islands: covering 100% of demersal fish (MIS_DES_0_0_0).

Circumstances related to the Protocol regulations, management measures in the Spanish fishing ground (closed seasons, TACs) or the abundance of the stocks in one fishing ground or another may affect the activity of the fleet.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The PSU selection is based on historical knowledge of the target fisheries, covering the main landing ports of the fleets considered.
The selection of the sampling day is not random, but depends on the availability of trips landed in port according to the seasonality of the fisheries and the fishing strategy of the metiers. Therefore, the method of selecting on-shore events for sampling is defined as Non-Probabilistic Judgement Sampling ("NPJS").
The Secondary Sampling Units (SSU = boxes of the selected species) are randomly selected from the target métiers. All fractions are considered for each stock as follows.

- Anchovy, (*Engraulis encrasicolus)* from PS_SPF_0_0_0
- Small pelagic: Atlantic chub mackerel, (*Scomber colias)*; Blue jack mackerel, (*Trachurus picturatus)*; Sardine, (*Sardina pilchardus)*; Round sardinella, (*Sardinella aurita*) from PS_SPF_10_0_0
- Benguela hake, (*Merluccius polli*) from OTB_DEF_>=70_0_0
- Parrotfish,(*Sparisoma cretense*) from MIS_DES_0_0_0

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

Regional coordination:
N

Link to sampling design documentation:
All relevant information can be found in the sampling manuals written by the scientific staff supervising the fisheries in the

area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Compliance with international recommendations:

Y

Link to sampling protocol documentation:

All relevant information can be found in the sampling manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Compliance with international recommendations:

Y

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

Y

Monitoring of sampling progress within the sampling year:

Y. Monthly monitoring of data collected from the samplers. In the IEO laboratories, technical staff checks the data collected and, if there are some problems or mistakes, speaks with samplers to solve possible doubts.

Data capture

Means of data capture:

Length measurements of fish and cephalopods are taken with measuring boards, while calipers are used for crustaceans.
All data of the length sampling are captured and registered written directly on the sampling sheets designed specifically for it. Sometimes the sampler uses a recorder to collect the data, and after the visit of market he/she transcribes the information the sampling sheets. Data are computerized to the IEO SIRENO database as soon as possible

Data capture documentation:

All relevant information can be found in the sampling manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Quality checks documentation:

N. Biological data is checked at the laboratory in order to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases *ad hoc*.

AR comment: No deviations or developments.

Data storage

National database:

All data are stored in the IEO data base (SIRENO, currently as national database), processed and analyzed by the IEO scientists to be used in the CECAF assessment WGs and/or Joint Scientific Committees of SFPAs, following the requirements of these data by end-users.

International database:

Data are uploaded at The Regional Data Base (RDB) hosted and maintained by ICES.

Quality checks and data validation documentation:

Documents on quality checks are currently at the preparation stage.
Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length. All sampling information (métier, port, name of vessel, gear, name of species, commercial category...) must be selected from a dropdown.
The system compares the weight of the length sampling and the calculated weight with the length-weight relationship.
Data sets, apart from SIRENO storage and processing, are also explored and checked by IEO scientific staff to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases *ad hoc*.

AR comment: No deviations or developments.

Sample storage

Storage description:

This sampling scheme doesn't produce samples to store.

Sample analysis:

This sampling scheme doesn't produce samples. No tissues are taken (age structures, stomach, plankton or genetics). CECAF does not carry out age-based assessments

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N. Documentation on processes to evaluate accuracy is still ongoing (not yet finalized).

Editing and imputation methods:

N. Documentation is still ongoing (not yet finalized).

Quality document associated to a dataset: N. Documentation on processes to evaluate quality is still ongoing (not yet finalized). **Validation of the final dataset:** Sampling levels and data quality are considered adequate, based on experience and DCF requirements, following quality levels (CV in previous technical reports), and the agreements achieved in the RCGs meetings. Documentation of the quality assurance framework is in progress and not available yet.
AR comment: No deviations or developments.

ESP-IEO_P3_BioSpec

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: Other regions & Outermost regions

Sampling scheme identifier: ESP-IEO_P3_BioSpec

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):

Sampling scheme aiming at collecting biological samples (age, weight, sex and maturity variables) from commercial landings on-shore for the species included in table 2.2 of the WP. The scheme covers landings from the artisanal Spanish fleet operating under Sustainable Fisheries Partnership Agreements (SFPAs) and the fleet operating in the EU waters of Canary Island (outermost regions).

Description of the population

Population targeted:

The primary sampling unit (PSU) is the stock, from the national ports where the mentioned fleets land.
Circumstances related to the Protocol regulations, management measures in the Spanish fishing ground (closed seasons, TACs) or the abundance of the stocks in one fishing ground or another may affect the activity of the fleet

Population sampled:

The landed fraction of the target populations will be sampled periodically at the IEO laboratories, in order to cover the largest possible distribution area of each population. The samples will be obtained from the most important markets.

Stratification:

Population targeted		Geographical Stratas	# Strata	Temporary Strata
Engraulis encrasicolus	34	34.1.11	1	Monthly
Scomber colias	34	34.1.2	1	Monthly
Sardina pilchardus	34	34.1.11/34.1.2	2	Monthly
Sardinella aurita	34	34.1.2	1	Monthly
Trachurus picturatus	34	34.1.2	1	Monthly

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:

The sample/subsample is selected randomly (SRS) from landing boxes. The selected sample is entirely biologically analyzed (several biological variables are collected on each sampled fish until the expected number of samples is reached).

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

N

Regional coordination:

N

Link to sampling design documentation:

All relevant information can be found in the sampling manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3:

Evaluación de recursos pesqueros del Atlántico centro-oriental)

Compliance with international recommendations:

Y

Link to sampling protocol documentation:

All relevant information can be found in the sampling manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Compliance with international recommendations:

Y

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

N/A. The fraction of the landing to be sampled is purchased from a vendor

Monitoring of sampling progress within the sampling year:

Y. It is intended that all the sampling strata are well represented, intensifying the samplings in the worst represented strata.

AR comment: No deviations or developments.

Data capture

Means of data capture:

For most of the stocks, data from samplings are captured and registered written directly on the sampling sheets designed specifically for it and computerized to the IEO SIRENO database as soon as possible.

Individual weight and gonad weight are taken with precision weight scales. Length measurements of fish and cephalopods are taken with measuring boards, while calipers are used for crustaceans.

Maturity scales follow the agreements and recommendations of related workshops.

Data capture documentation:

All relevant information can be found in the sampling manuals written by the scientific staff supervising the fisheries in the area (internal reports). All this documentation can be reviewed at http://www.ieo.es/es_ES/web/ieo/pndb (section P3: Evaluación de recursos pesqueros del Atlántico centro-oriental)

Quality checks documentation:

N. Biological data is checked at the laboratory in order to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases *ad hoc*.

AR comment: No deviations or developments.

Data storage

National database:

All data are stored in the IEO data base (SIRENO, currently as national database), processed and analyzed by the IEO scientists to be used in the CECAF assessment WGs and/or Joint Scientific Committees of SFPAs, following the requirements of these data by end-users.

International database:

N/A

Quality checks and data validation documentation:

Documents on quality checks are currently at the preparation stage. Data sets, apart from SIRENO storage and processing, are also explored and checked by IEO scientific staff to detect errors and inconsistencies (outliers, trends, range of variables, dispersion) and eventually recorded in data bases *ad hoc*.

Sample storage

Storage description:

The otoliths of selected species are stored in boxes duly labelled and stored on the shelves of the growth warehouses of the IEO oceanographic centres where the samplings have been carried out. These pieces are stored systematically, without expiration date.

Sample analysis:

No tissues are taken (age structures, stomach, plankton or genetics). CECAF does not carry out age-based assessments.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N. Documentation on processes to evaluate accuracy is still ongoing (not yet finalized).

Editing and imputation methods:

N. Documentation is still ongoing (not yet finalized).

Quality document associated to a dataset: N. Documentation on processes to evaluate quality is still ongoing (not yet finalized). **Validation of the final dataset:** Sampling levels and data quality are considered adequate, based on experience and DCF requirements, following quality levels (CV in previous technical reports), and the agreements achieved in the RCGs meetings. Documentation of the quality assurance framework is in progress and not available yet.
AR comment: No deviations or developments.

ESP_IEO_P4_AtSea_all

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: Other Regions

Sampling scheme identifier: ESP_IEO_P4_AtSea_all

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting length samples from commercial and non-commercial catches at sea for all species listed in Table 1 of the Commission Delegated Decision (EU) 2021/1167. The scheme covers observations at sea in the Atlantic Ocean and adjacent Seas, Indian Ocean, Western Central Pacific and Eastern Central Pacific.

Description of the population

Population targeted:
The primary sampling units (PSU) are the fishing trips. The population targeted is the list of vessels with license to fish for each fishery under the MS flag.

Population sampled:
The entire target population is susceptible to sampling, excluding vessels without habitability for observers on board.

Stratification:
Stratification has been done according to species/metier/area of each fishery. The population was stratified in 15 strata (métier):

1. LLALB_MED_AtSea: drifting longlines targeting albacore in Mediterranean Sea.
2. LLBFT_MED_AtSea: drifting longlines targeting bluefin tuna in Mediterranean Sea.
3. LLSWO_MED_AtSea drifting longlines targeting swordfish in Mediterranean Sea.
4. LLLTA_MED_AtSea: drifting longlines targeting little tuna in Mediterranean Sea.
5. PS_MED_BFT_AtSea: purse seine in Mediterranean Sea.
6. LLSWO_ATL_AtSea: drifting longlines targeting swordfish in the Atlantic Ocean.
7. LLSWO_IND_AtSea: drifting longlines targeting swordfish in the Indian Ocean.
8. LLSWO_EPAC_AtSea: drifting longlines targeting swordfish in Eastern Pacific Ocean.
9. LLSWO_WPAC_AtSea: drifting longlines targeting swordfish in Western Pacific Ocean.
10. PS_ATL_AtSea_IEO: purse seine in the Atlantic Ocean.
11. PS_IND_AtSea_IEO: purse seine in the Indian Ocean.
12. PS_EPAC_AtSea_IEO: purse seine in the Eastern Pacific Ocean.
13. PS_WPAC_AtSea_IEO: purse seine in the Western Pacific Ocean.
14. TRAP_MED_SmallTunas: stationary uncovered pound nets in the Mediterranean Sea.
15. TRAP_ATL_BFT: stationary uncovered pound nets in the Atlantic Ocean.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The PSU selected for sampling will be randomly selected from the list of vessels with a fishing license according to spatial and temporal strata.
The target coverage for tropical purse seine fisheries in Atlantic and Indian Oceans is 10% of the total trips and will be uniformly distributed along the year. For the IATTC area the intended coverage of purse seine fisheries is 100% of the annual primary sampling units (50% by IATTC observers and 50% by national observers).
There are three catch fractions depending on the fisheries involved in the sampling design: commercial target species (stored on board), bycatch (incidental catches) and discarded commercial species.
In the Mediterranean longline fishery, a number of trips are planned to assure the Spatio-temporal strata coverage (month, 5º x 5º grid, métier). The PSUs are selected randomly among those that target the month, area, and metier to be covered.
The observers on board collect data on catches (target and bycatch species) and also biological data from commercial fisheries, as well as information about the condition of the bycatch when discarded (death or alive). In the case of tropical purse seines, the observers on board collect information on the bycatch discards for all fishing sets. The activity related to floating objects is also recorded on board. The catch of purse seiners in the Mediterranean Sea is sent to a flattering cage.
Is the sampling design compliant with the 4S principle?: Y
N
Regional coordination:
Yes. The sampling design and protocols for the purse seiner fisheries landing in the Atlantic and Indian oceans are coordinated between the Spanish (IEO & AZTI) and French institutes. They were developed originally in an informal basis and later under agreements with IRD (Institut de Recherche pour le développement, France) and other no-MS as SFA (Seychelles Fishing Authority) and CRODT (Centre de Recherche Océanographique de Dakar Thiaroye). Currently, these agreements are not in place but all these institutions continue working together and following the same protocols.
In the case of the IATTC convention area, observers follow the protocols developed by the IATTC Secretariat in the framework of the Agreement on the International Dolphin Conservation Program (a legally-binding multilateral agreement which entered into force in February 1999, with 13 contracting parties, including the EU).
Link to sampling design documentation:
The sampling design follows RFMOs guidelines. These are the links where the documentation can be found:
https://www.iccat.int/es/iccatmanual.html
https://www.iotc.org/documents/WPDCS/14/35-ROS_Standards
https://www.iattc.org/Downloads.htm/ (into the link goes to 'Red de cerco - Programa observadores/Manual completo2017')
Sarralde *et al* 2009 Sampling procedures for tropical tuna in the Atlantic and Indian Oceans. SCRS/2009/43: http://www.ieo.es/es_ES/web/ieo/pndb (section P4: Evaluación de pesquerías de túnidos y afines).
Compliance with international recommendations:
Y.
Link to sampling protocol documentation:
The sampling protocols follow RFMOs guidelines. These are the links where the documentation can be found:
https://www.iccat.int/es/iccatmanual.html;
https://www.iotc.org/documents/WPDCS/14/35-ROS_Standards
https://www.iattc.org/Downloads.htm/ (into the link goes to 'Red de cerco - Programa observadores/Manual completo2017')
Sarralde *et al* 2009 Sampling procedures for tropical tuna in the Atlantic and Indian Oceans. SCRS/2009/43: http://www.ieo.es/es_ES/web/ieo/pndb (section P4: Evaluación de pesquerías de túnidos y afines).
In the Atlantic and Indian Oceans purse seine sampling by scientific observers follows a specific and common methodology edited in a manual used by IRD, AZTI and IEO.
Compliance with international recommendations:
Y.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
Y.
Monitoring of sampling progress within the sampling year:
The coverage of the sampling progress is monitored monthly.
In the Mediterranean longline fishery, once the onboard observer sends the trip data to the laboratory, data are reviewed and validated by cross-checking it with data from sales notes and logbooks. If errors are detected in data collection, the observer is contacted to correct them. If there is a problem with the boat that compromises the coverage of a stratum, there is a list of boats that allows solving the problem. If the problem occurs with the observer, a list of specialized and trained observers is available that permits us to replace it.
In the purse seine fleet in the Atlantic and Indian Oceans the sampling is evenly distributed across vessels. The aim is covering one trip per vessel, and trying to distribute observer trips randomly throughout the year. In the case of the IATTC convention area, there is a mandatory observer coverage of 100% carried out in collaboration with the IATTC Secretariat. IATTC and Member State observers are generally deployed alternating each two trips.

AR comment: No deviations or developments.

Data capture

Means of data capture:

The size of the fish is measured using a measuring board, tape or calliper and weights are collected with scales or dynamometers, depending on the fish size. The sampling information is recorded on sheet forms and later is computerized.

In the case of purse seines fisheries, observers transfer the information collected on dedicated forms to databases using specific software. This software has been developed and supported by the IATTC technical staff (Observer, IATTC Secretariat, pers.com) and in the Atlantic and Indian Oceans, the development and support is carried out by IRD (ObServe, Cauquil *et al 2015*).

Data capture documentation:

The observers on board have protocols for collecting data that follow the recommendations of tuna-RFMOs sampling manuals. The links:

ICCAT. 2006-2016. Manual de ICCAT. Comisión internacional para la conservación del atún Atlántico. En: Publicaciones ICCAT [on line]. Actualizado 2016. ISBN (Edición electrónica): 978-92-990055-0-7, https://www.iccat.int/es/iccatmanual.html.

https://www.iotc.org/data-and-statistics.

Sarralde *et al* 2009 Sampling procedures for tropical tuna in the Atlantic and Indian Oceans. (SCRS/2009/43).

https://gitlab.com/ultreiaio/ird-observe

http://ultreiaio.gitlab.io/ird-observe/

Cauquil P., Rabearisoa N., Sabarros P., Chavance P. and Bach P. (2015) ObServe: Database and operational software for longline and purse seine fishery data. 13th Working Party on Billfish. Indian Ocean Tuna Commission. Available online at: https://www.iotc.org/documents/observe-database-and-operational-software-longline-and-purse-seine-fishery-data

Quality checks documentation:

N. The observer data is carefully reviewed by the IEO staff in the laboratory in order to detect errors and inconsistencies in the recorded data before consolidating them. General quality indicators are also used for purse seiner observer's data coming from the three oceans, included in the software (https://gitlab.com/ultreiaio/ird-observe).

AR comment: No deviations or developments.

Data storage

National database:

The data collected by observers on board are stored into specific databases designed according to specificities of the fisheries and into the SIRENO database which is managed by the IEO.

In addition the observer's data obtained from the purse seiners in the Atlantic and Indian oceans are stored in a database called ObServe which has been developed by IRD and is used by IRD, AZTI and IEO.

In the Eastern Pacific Ocean the data from the observation on board EU purse seiners are stored in an IATTC_IEO shared database. The sampling by scientific observers follows a specific methodology that can be consulted in http://www.iattc.org/Downloads.htm

International database:

Aggregated data are stored on tuna-RFMOs databases:

ICCAT (International Commission for the Conservation of Atlantic Tunas): https://iccat.int/en/accesingdb.html

IOTC (Indian Ocean Tuna Commission): https://www.iotc.org/data/datasets

IATTC (Inter-American Tropical Tuna Commission): https://www.iattc.org/PublicDomainData/IATTC-Catch-by-species1.htm

WCPFC (Western and Central Pacific Fisheries Commission): https://www.wcpfc.int/data-catalogue

Quality checks and data validation documentation:

Documents on quality checks are currently at the preparation stage.

Once the data on observed trips arrive at MS laboratory, these data are revised by experts to detect errors and cross-checked with both sales notes and logbooks records.

For purse seiners, at the end of each deployment, observers are debriefed for data validation following ad-hoc software tools developed for ObServe (Atlantic and Indian oceans) and Observer (Pacific ocean).

AR comment: No deviations or developments.

Sample storage

Storage description:

Samples for genetic (muscle tissue), reproduction (gonadal tissue), and age and growth (hard parts: otoliths and/or first ray of the first dorsal fin) are collected for the main tuna and tuna-like species. The samples are stored in adequate fixative solutions, frozen or stored in boxes in the IEO laboratory store. Samples are stored till they are analyzed or sent to the laboratories in charge to analyze them. A subsample of each genetic or reproductive sample is stored in our laboratory indefinitely. Each sample has a code that includes the year, the species, the gear, the tissue type, and a specific number.

Sample analysis:

Due to logistics constraints in distant water fisheries, tissue samples are not systematically collected in the purse seine fishery. Eventually, some biological samples are taken in the framework of national or international projects. In these cases, the samples are stored in the research centre requested.

ICCAT SMT Research program: review 2018-21 SMTYP: SCRS/P/2021/036 (Lucena F., and Hazin F.), in 2022 for small tunas (LTA, BON & WAH).
Processing of samples for maturity and fecundity:
Saber, D. Macías, J.M. Ortiz de Urbina, O.S. Kjesbu. (2016). Contrasting batch fecundity estimates of albacore (*Thunnus alalunga*), an indeterminate spawner, by different laboratory techniques. FISHERIES RESEARCH. 176, 76-85.
Saber, D. Macías, J.M. Ortiz de Urbina, O.S. Kjesbu. (2015) Stereological comparison of oocyte recruitment and batch fecundity estimates from paraffin and resin sections using spawning albacore (*Thunnus alalunga*) ovaries as a case study. Journal of Sea Research JOURNAL OF SEA RESEARCH. Volumen: 95: 226-238.
Saber, S., Ortiz de Urbina, J., Gillespie K., Poisson F., Coelho R., Rosa D., Puerto, M.A., Macías, D. 2020. A preliminary analysis of the maturity of ICCAT swordfish stocks Collect. Vol. Sci. Pap. ICCAT, 77(3): 537-551.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
N. Documentation is still ongoing (not yet finalized).
Editing and imputation methods:
N. Documentation is still ongoing (not yet finalized).
Quality document associated to a dataset:
N. Documentation on processes to evaluate quality is still ongoing (not yet finalized).
Validation of the final dataset:
Data sets are explored and checked by experts IEO scientific staff. Quality checking for data processing includes automatic analysis of databases producing tables with detected mistakes and a report containing the percentages of mistakes to be corrected.
Once the data arrive at the laboratory, the data are revised by experts to detect errors and cross-checked with both sales notes and logbooks registers. In the case of purse seiners an annual comparison between declared logbooks and estimated catches is made in order to correct species composition and catch based on T3 treatment, taking into account data from sampling at port. This methodology is common to IRD and IEO.

AR comment: No deviations or developments.

ESP_IEO_P4_OnShore_all

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: Other Regions

Sampling scheme identifier: ESP_IEO_P4_OnShore_all

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting length samples from commercial landings at fishing ports for all species listed in Table 1 of the Commission Delegated Decision (EU) 2021/1167. The scheme covers landings from the Atlantic Ocean and adjacent Seas.

Description of the population

Population targeted:
The primary sampling units (PSU) are the fishing trips. The population targeted is the list of vessels with license to fish for each fishery.

Population sampled:
The entire target population is susceptible to sampling. It will be sampled a representative number of trips of each of the fisheries.

Stratification:
Stratification has been done according to species/metier/area of each fishery. The population was stratified in 9 strata (métier):

1. LL_MED_Port: drifting longlines in the Mediterranean Sea.
2. BB_BFT_CantabrianSea_IEO_Port: baitboat targeting bluefin tuna in the Cantabrian Sea.
3. BB_BFT_Strait_Port: baitboat targeting bluefin tuna in the Strait of Gibraltar..
4. HAND_BFT_Strait_Port: handline targeting bluefin tuna in the Strait of Gibraltar.
5. BB_ALB_CantabrianSea_IEO_Port: baitboat targeting albacore in Cantabrian Sea
6. TROL_ALB_CantabrianSea_IEO_Port: trolling lines in Cantabrian Sea
7. LLSWO_ATL_Port: drifting longlines targeting swordfish in the Atlantic Ocean.
8. BB_MSP_Canary_Port: baitboat in Canary Islands
9. BB_TROP_Dakar_Port: baitboat landing in Dakar.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The PSU will be randomly selected for sampling by spatial and temporal strata. The sampling fraction is considered to be proportional to the total population. The catch fractions depending on the fisheries involved in the sampling design are the commercial landings.
For the baitboat fisheries, sampling will be tentatively covering all landings in the port of Dakar (Senegal). For every trip sampled, the freezing wells where tropical tunas are stored are considered as one.

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

Regional coordination:
Yes. The sampling design and protocols for the baitboat fishery landing in Dakar have been developed regionally under agreements with IRD (Institut de Recherche pour le développement, France) and other non-EU MS as SFA (Seychelles Fishing Authority), CRO (Centre de Recherches Océanologiques in Abidjan) and CRODT (Centre de Recherche

Océanographique de Dakar Thiaroye). Currently, these agreements are not in force but all these states go on working together and following the same protocols for sampling. The sampling activities are standardized for the MS of the EU purse seiner fishery in the central-east Atlantic and in the Indian ocean.
No, in the case of other metiers.

Link to sampling design documentation:

The sampling design follows RFMOs guidelines. These are the links where the documentation can be found:
https://www.iccat.int/es/iccatmanual.html;
https://www.iotc.org/documents/WPDCS/14/35-ROS_Standards
Sarralde *et al* 2009 Sampling procedures for tropical tuna in the Atlantic and Indian Oceans. SCRS/2009/43: http://www.ieo.es/es_ES/web/ieo/pndb (section P4: Evaluación de pesquerías de túnidos y afines)

Compliance with international recommendations:

Y.

Link to sampling protocol documentation:

The sampling protocol follows RFMOs guidelines. These are the links where the documentation can be found:
https://www.iccat.int/es/iccatmanual.html;
https://www.iotc.org/documents/WPDCS/14/35-ROS_Standards
Sarralde *et al* 2009 Sampling procedures for tropical tuna in the Atlantic and Indian Oceans. SCRS/2009/43: http://www.ieo.es/es_ES/web/ieo/pndb (section P4: Evaluación de pesquerías de túnidos y afines).

Compliance with international recommendations:

Y.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

N.

Monitoring of sampling progress within the sampling year:

Monitoring of sampling is based on the annual activity of the commercial fleet by spatial and monthly time strata.
In the case of baitboat landing in Dakar (Senegal) the target sampling includes all landings in the main ports. Due to this coverage, no need for allocation of the PSU is needed. Sampling teams are required to provide data on a monthly basis and instructed to report any contingency as it occurs. The sampling of the secondary units (well) is aimed at optimizing the coverage of the different strata (geographical area, set type and month). Therefore, in exceptional circumstances, sampling will try to improve the coverage of undersampled strata.

AR comment: No deviations or developments.

Data capture

Means of data capture:

Fish are measured at market while landings. The size of the fish is measured using a measuring board, tape or calliper and weights are collected with scales or dynamometers, depending on the fish size. The sampling information is recorded on sheet forms and later is computerized in a specific DB application developed by the national authority in collaboration with the research centres.
For the baitboat fisheries landing in Dakar (Senegal), information will be collected by using the dedicated software AVDTH: "Acquisition et validation des données de pêche au thon tropical" (see Lechauve, 1999 for further detail: AVDTH98: acquisition et validation des données de pêche au thon tropical (ird.fr)".

Data capture documentation:

The protocol and means for collecting data are described in the port sampling manual of ICCAT. The links: https://www.iccat.int/es/iccatmanual.html.

Quality checks documentation:

N. The data is carefully reviewed by the IEO staff in the laboratory in order to detect errors and inconsistencies in the recorded data before consolidating them. Logbook data are cross-checked against the information provided by the Spanish Fisheries Secretariat and recorded through the ERS.
Our team carries out biannual surveys to the skippers of the longline fishery vessels to test the correct allocation of the trips to metier in the Mediterranean.
Length sampling hard copies are made available together with the keypunched data. In case of detection of anomalies, information is cross-checked between both sources.

AR comment: No deviations or developments.

Data storage

National database:

The data collected are stored into specific databases designed according to the specificities of the fisheries and into the SIRENO database which is managed by the IEO.

International database:

Agregated data are stored on ICCAT (International Commission for the Conservation of Atlantic Tunas): https://iccat.int/en/accesingdb.html.

Quality checks and data validation documentation:
Documents on quality checks are currently at the preparation stage.

AR comment: No deviations or developments.

Sample storage

Storage description:
Samples for genetic (muscle tissue), reproduction (gonadal tissue), and age and growth (hard parts: otoliths and/or first fin ray of the first dorsal fin) are collected for the main tuna and tuna-like species. The samples are stored in adequate fixative solutions, frozen or stored in boxes in the IEO laboratory store. Samples are stored till they are analyzed or sent to the laboratories in charge to analyze them. A subsample of each genetic or reproductive sample is stored in our laboratory indefinitely. Each sample has a code that includes the year, the species, the gear, the tissue type, and a specific number.
Sample analysis:
Processing of samples for maturity and fecundity:
Saber, D. Macías, J.M. Ortiz de Urbina, O.S. Kjesbu. (2016). Contrasting batch fecundity estimates of albacore (*Thunnus alalunga*), an indeterminate spawner, by different laboratory techniques. FISHERIES RESEARCH. 176, 76-85.
Saber, D. Macías, J.M. Ortiz de Urbina, O.S. Kjesbu. (2015) Stereological comparison of oocyte recruitment and batch fecundity estimates from paraffin and resin sections using spawning albacore (*Thunnus alalunga*) ovaries as a case study. Journal of Sea Research JOURNAL OF SEA RESEARCH. Volumen: 95: 226-238.
Saber, S., Ortiz de Urbina, J., Gillespie K., Poisson F., Coelho R., Rosa D., Puerto, M.A., Macías, D. 2020. A preliminary analysis of the maturity of ICCAT swordfish stocks Collect. Vol. Sci. Pap. ICCAT, 77(3): 537-551.
Farley JH, Williams AJ, Hoyle SD, Davies CR, Nicol SJ (2013) Reproductive Dynamics and Potential Annual Fecundity of South Pacific Albacore Tuna (*Thunnus alalunga*). PLOS ONE 8(4): e60577. https://doi.org/10.1371/journal.pone.0060577
Processing of samples (otoliths/ fin ray) for aging:
Brown-Peterson N.J., Wyanski D.M., Saborido-Rey F., Macewicz B.J. and Lowerre-Barbieri S.K. 2011. A standardized terminology for describing reproductive development in fishes. Marine and Coastal Fisheries: Dynamics Management and Ecosystem Science 3, 52-70.
Campana, S. E. 2001. Accuracy, precision and quality control in age determination, including a review of the use and abuse of age validation methods. Journal of Fish Biology, 59, 197–242 doi:10.1006/jfbi.2001.1668.
Ortiz de Zárate, V, Valeiras, X., and Ruiz, M. 2007. Sampling protocol for skeletal structures of North Atlantic albacore tuna (Thunnus alalunga) and ageing interpretation. Col. Vol. Sci. Pap. ICCAT, 60(2): 492-506.
Ortiz de Zárate, V., E.A. Babcock. 2016. Estimating individual growth variability in albacore (*Thunnus alalunga*) from the North Atlantic stock: Aging for assessment purposes. Fisheries Research 180, 54–66.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
N. Documentation is still ongoing (not yet finalized).
Editing and imputation methods:
N. Documentation is still ongoing (not yet finalized).
Quality document associated to a dataset:
N. Documentation on processes to evaluate quality is still ongoing (not yet finalized).
Validation of the final dataset:
Data sets are examined and checked by IEO experts scientific staff. Quality checking for data processing includes automatic analysis of databases producing tables with detected mistakes and a report containing the percentages of records to be corrected.
Once the data arrive at the laboratory, the data are revised by experts to detect errors and cross-checked with both sales notes and logbooks registers and contacting network sampling staff for improvement in collection of data.

AR comment: No deviations or developments.

ESP_IEO_P4_OnShore_sp

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: Other Regions

Sampling scheme identifier: ESP_IEO_P4_OnShore_sp

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting length samples from commercial landings at Abidjan (Ivory Coast) and Victoria (Seychelles) ports for bigeye tuna (*Thunnus obesus*), yellowfin tuna (*Thunnus albacares*) and skipjack tuna (*Katsuwonus pelamis*) as main objetives. The scheme covers landings from the Atlantic and Indian Ocean.

Description of the population

Population targeted:
The primary sampling units (PSU) are the fishing trips. The population targeted corresponds to the list of national purse seine vessels with license to fish in the central-east Atlantic and Indian oceans and landing in the main harbours for both oceans.

Population sampled:
Sampling will tentatively be covering all landings in the ports of Dakar (Senegal) and Abidjan (Ivory Coast), in the Atlantic and in the port of Victoria (Seychelles) in the Indian Ocean.

Stratification:
Stratification has been done according to species/metier/area of fishery. Stratification for purse-seiners has been defined using detailed analyses from the European ET Research Programme (No. 95/37 "Analysis of the Tropical Tuna Multi-species Sampling Scheme"). It is carried out according to three criteria: zone, time and association. The population was stratified in 2 strata (métier):

1. PS_ATL_Port: purse seiners in the Atlantic Ocean.
2. PS_IND_Port: purse seiners in the Indian Ocean.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The PSU selected for sampling will be randomly selected within each stratum. The sampling teams collect all the PSU information landing in the ports of Dakar (Senegal) and Abidjan (Ivory Coast) in the Atlantic and in the port of Victoria (Seychelles) in the Indian.
For every trip sampled, the freezing wells where tropical tunas are stored are considered secondary sampling units (18-26 by trip, considering the whole catch) of the population. They are selected according to the characteristics of the sets for each one, following spatio-temporal criteria and considering the fishing mode (on tuna schools associated with floating objects (FOB) or on free schools). An average of 3-10 wells per trip are sampled according to the protocols. The number depends on the homogeneity of the strata in the wella and on their availability.
Sampling is carried out concurrently in port, so all the target species involved are selected for the sampling.

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

Regional coordination:
Yes. The sampling design and protocols have been developed regionally under agreements with IRD (Institut de Recherche pour le développement, France) and other non-EU MS as SFA (Seychelles Fishing Authority), CRO (Centre de Recherches

Océanologiques in Abidjan) and CRODT (Centre de Recherche Océanographique de Dakar Thiaroye). Currently, these agreements are not in force but all these states go on working together and following the same protocols for sampling. The sampling activities are standardized for the MS of the EU purse seiner fishery in the central-east Atlantic ocean and in the Indian ocean.
More information from Pallarés & Petit, (1998 "Tropical tunas: new sampling and data processing strategy for estimating the composition of catches by species and sizes "Collect. Vol. Sci. Pap. ICCAT, 48: 230–246) and Duparc et al. (2019 "Assessment of the species composition of major tropical tunas in purse seine catches: a new modelling approach for the Tropical Tuna Treatment processing. "Pages 1–35 Report of the 21th session of the IOTC Working Party on Tropical Tunas. IOTC, San Sebastián, Spain).

Link to sampling design documentation:

The sampling design follows RFMOs guidelines. These are the links where the documentation can be found:
https://www.iccat.int/es/iccatmanual.html
https://www.iotc.org/documents/WPDCS/14/35-ROS_Standards
Sarralde *et al* 2009 Sampling procedures for tropical tuna in the Atlantic and Indian Oceans. SCRS/2009/43: http://www.ieo.es/es_ES/web/ieo/pndb (section P4: Evaluación de pesquerías de túnidos y afines).

Compliance with international recommendations:

Y.

Link to sampling protocol documentation:

The sampling protocols follow RFMOs guidelines. These are the links where the documentation can be found:
https://www.iccat.int/es/iccatmanual.html
https://www.iotc.org/documents/WPDCS/14/35-ROS_Standards
Sarralde et al 2009 Sampling procedures for tropical tuna in the Atlantic and Indian Oceans. SCRS/2009/43: http://www.ieo.es/es_ES/web/ieo/pndb (section P4: Evaluación de pesquerías de túnidos y afines).

Compliance with international recommendations:

Y.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

N.

Monitoring of sampling progress within the sampling year:

Monitoring of sampling is done on the bases of activity of the commercial fleet by spatial and time strata annually.

AR comment: No deviations or developments.

Data capture

Means of data capture:

Fish are measured at market while landings. The size of the fish is measured using a calliper depending on the fish size.
Information will be collected by using the dedicated software AVDTH: “Acquisition et validation des données de pêche au thon tropical” (see Lechauve, 1999 for further detail: AVDTH98: acquisition et validation des données de pêche au thon tropical (ird.fr)”.
Currently the National Fisheries Authority is developing a new software to streamline the information recorded by the skippers through the ERS (set time, well plan, etc). The data collected during the biological sampling in port will be recorded by the sampling teams in a specific application developed by the National Authority in collaboration with the research centres.

Data capture documentation:

The port observers have protocols for collecting data that follow the recommendations of tuna-RFMOs sampling manuals. The links:
https://www.iccat.int/es/iccatmanual.html
https://www.iotc.org/data-and-statistics
Sarralde *et al* 2009 Sampling procedures for tropical tuna in the Atlantic and Indian Oceans. (SCRS/2009/43).(https://www.iccat.int/es/pubs_CVSP.html).
Lechauve, J.J. 1999. Acquisition et validation des données de pêche au thon tropical. Document Scientifique et Technique du Centre IRD de Bretagne Doc. Sci. Tech. Cent. de Bretagne IRD (ex ORSTOM) N° 84, mai 1999
https://www.mapa.gob.es/es/pesca/temas/vigilancia-pesquera/manual-cumplimentacion-deav4_tcm30-502219.pdf

Quality checks documentation:

N. The data is carefully reviewed by the EO staff in the laboratory in order to detect errors and inconsistencies in the recorded data before storing them.

AR comment: No deviations or developments.

Data storage

National database:

The data are stored into specific databases designed according to different strata of the fleet and into the SIRENO database which is managed by the IEO.

International database:
These data are stored on tuna-RFMOs database:
ICCAT (International Commission for the Conservation of Atlantic Tunas): https://iccat.int/en/accesingdb.html
IOTC (Indian Ocean Tuna Commission): https://www.iotc.org/data/datasets
Quality checks and data validation documentation:
Documents on quality checks are currently at the preparation stage.

AR comment: No deviations or developments.

Sample storage

Storage description:
Sample analysis:
Eventually, some biological samples are taken (spines, gonads, muscle tissue) in the framework of national or international projects. In these cases, the samples are stored in the research centre requested.
ICCAT SMT Research program: review 2018-21 SMTYP: SCRS/P/2021/036 (Lucena F., and Hazin F.), in 2022 for small tunas (LTA, BON & WAH).

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
N. Documentation is still ongoing (not yet finalized).
Editing and imputation methods:
N. Documentation is still ongoing (not yet finalized).
Quality document associated to a dataset:
N. Documentation on processes to evaluate quality is still ongoing (not yet finalized).
Validation of the final dataset:
Data sets are explored and checked by experts IEO scientific staff. Quality checking for data processing includes automatic analysis of databases producing tables with detected mistakes and a report containing the percentages of mistakes to be corrected.
Once the data arrive at the laboratory, the data are revised by experts to detect errors and cross-checked with both sales notes and logbooks registers. In the case of purse seiners an annual comparison between declared logbooks and estimated catches is made in order to correct species composition and catch based on T3 treatment, taking into account data from sampling at port. This methodology is common to IRD and IEO.

AR comment: No deviations or developments.

ESP_IEO_P5_AtSea

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: Other Regions (NAFO) & North-East Atlantic & North Sea and Eastern Arctic

Sampling scheme identifier: ESP_IEO_P5_AtSea

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting fishing data, catches composition (all fractions), length samples and biological parameters from commercial trips at sea operating in international waters of NEAFC & NAFO Regulatory Areas for all species listed in Table 1 of the EU MAP Delegated Decision annex.
Sampling is concurrent but observers priorize sampling of species listed in Table 2.1 of the Spanish Work Plan covered by a commercial sampling scheme for length and the sampling planned in Table 2.2 for biological variables.
Also, VME indicators data, incidental catches of sensitive species and marine litter data are collected.

Description of the population

Population targeted:
The primary sampling units (PSU) are all vessel trips of Spanish trawlers (OTB & OTM) operating in international waters of NEAFC & NAFO Regulatory Areas.

Population sampled:
The target population: is the total number of trips in a year carried out by the Spanish fleet targeting the stocks selected for sampling.
All fishing trips are susceptible to be sampled and sampling is tried to be distributed throughout the year and in all fisheries planned.

Stratification:
The target population includes commercial fleet with similar technical characteristics (freezer trawlers over 40 m length) operating in international waters of NEAFC & NAFO Regulatory Areas. In addition, these vessels operate with fishing licenses that allow them to fish in most of the target fisheries. Often, during the same trip (PSU), a vessel can operate in several areas and with several fishing gears.
For these reasons, the following sampled population have been stratified jointly with a similar sampling plan to be sampled annually:

Region	RFMO	Sampling frame identifier	Area
Other Regions	NAFO	OTB_MDD_40-60-130-280	NAFO Div. 3LMNO
North-East Atlantic	ICES	OTB_DWS_100-129	ICES 12, 6b1
North-East Atlantic	ICES	OTM_DEF_100-119	ICES 12, 14
North Sea and Eastern Arctic	ICES	OTM_DEF_100-119	ICES 1-2
North Sea and Eastern Arctic	ICES	OTB_DEF_>=120	ICES 1-2

In addition, IEO staff that monitor these fisheries are the same for all population sampled which means that same sampling methodologies, implementation and data processing are performed.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The sampling frame is the list of vessels with license to fish in each target fishery.
The selection of the sampling frame is according to to the scientific experience gained from the study of fisheries in the area
Method of PSU selection: Each PSU is selected by a systematic non-random sampling from a list of vessels ranked by the effort of observation on board in previous years by fishery and updated every year. The selection is made by the fisheries authority which granted the fishing license.
The number of fishing trips to be sampled has been calculated based on data from previous years in order to keep the coverage enough to comply the requirements of end users.
The SSU is the fishing haul and is randomly selected.
The method to collect data from commercial fisheries is the concurrent sampling on board carried out by observers at-sea who remain on board throughout the period of the whole fishing trip (1-3 months).
Observers at sea collect data on unsorted catches and discards.
The Sex-ratio index is achieved at the same time of sampling of length which are randomly collected and not stratified. The biological parameters (Weight, Age, Maturity) come from a sampling design stratified by length class.
The data for the estimation of discards and catches structure consist on length data by sex and length-weight relationship collected by trip sampled. Raisings are done for each species by month and division. Finally, a raising is made to the total catch of the fishery.
The calculation to achieve other biological parameters will be estimated based on bootstrap procedures and fitting models with the tool INBIO 2.0* ("Estimation of biological parameters and their uncertainties through simulation techniques") developed in R environment by the IEO.

**Update of "Sampedro, P., Sainza, M. and Trujillo, V., 2005. A simple tool to calculate biological parameters'uncertainty. Working Document, In: Workshop on Sampling Desing for Fisheries Data (WKSDFD), Pasajes, Spain.*

Is the sampling design compliant with the 4S principle?:
Y
Regional coordination:
N
Link to sampling design documentation:
See above: Sampling design description
Compliance with international recommendations:
Y
Link to sampling protocol documentation:
MANUAL DEL OBSERVADOR repositorioIEO sep 2012.pdf
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)
Compliance with international recommendations:
N

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
Y
The refusal rate in the last years has been zero because each fishing license is linked to the acceptance of scientific observer on board.
Monitoring of sampling progress within the sampling year:
For each trip sampled an observer on board is appointed preferably with experience in sampling on board in these fisheries.
The training of the observer on board is carried out by technicians from the scientific institute who instruct the observer to carry out the tasks on board.
The observer collects data on paper forms and records them daily on a laptop.
During each sampled trip, the data collected is monitored through periodic email communications between the observer and hers/his coordinator.
The data collected is checked weekly and doubts or sampling problems on board are received and resolved at any time.
Once the observer returns to port, there is an interview with the coordinator and the forms and recorded data are thoroughly reviewed.
All fishing trips are susceptible of being sampled and the goal is share the sampling throughout the year and in all planned fisheries. Sampling needs are reviewed monthly
Usually vessels operating in this area have permissions for fishing with several trawls on the same trip (PSU) for operating in several fisheries. Observers are allocated to vessels but prior there is no accurate information on the planning of vessel activity (gear, areas,). Thus, it is difficult to predict in advance which métiers going to be sampled during the same voyage. Therefore different sampling targets are considered when the vessel operates with different métier.
The main cause of the deviation of the sampling planned is the lasting of the trips in these fisheries and the unpredictability of the permanence of observers in fishing areas due to the decisions taken by vessels' owners in the way of moving vessels

among areas. Although the behaviour of the fleet is impossible to change, it is important to improve coordination with the sectors involved: owners and administration authorities.

AR comment: No deviations or developments.

Data capture

Means of data capture:

Data are captured by the observers at sea using specific recording paper forms for each haul or sampling:

- Fishing Forms.
- Catches Forms.
- Length Sampling Forms.
- Biological Sampling Forms.
- Others Forms (VME Indicators, Incidental Catches)

Length data is collected using a measuring board for fish and cephalopods species and using a digital caliper for crustaceans.

Weight data is collected using marine scales (up to 6 kg and 20 kg) mainly. If the scale does not run properly then observers use dynamometers.

Variables as sex, maturity data is collected "de visu" in according to the protocols.

Data are recorded daily by the observers at sea on a laptop using the software LEJANAS and Excel.

Pictures of VME indicators and incidental by catch are taken by observers using a camera for data validation at the Lab.

Data capture documentation:

Manual ESP_IEO_P5_AtSea_Sampling (Spanish) MANUAL DEL OBSERVADOR repositorioIEO sep 2012.pdf

Manual ESP_IEO_P5_AtSea_Recording (Spanish)
Manual ESP_IEO_P5_AtSea_Maturity (Spanish)
Manual ESP_IEO_P5_AtSea_VME Indicators (Spanish)
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas).

Quality checks documentation:

N

Documentation will be available at the end of 2022.

Data of each trip, collected and recorded on board, are checked during and after the trip (in the laboratory) in order to detect errors and inconsistencies (detection of outliers, SOP of the length distributions, ranges of variables, etc.)

After the trip, the observer debugs all data, haul by haul and sampling by sampling. Finally, a random check of about 15% of the data is carried out to validate the quality of the results. Annually all sets of data for each fishery are checked previously to be used for assessment and other scientific tasks.

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("Seguimiento Informático de los Recursos Naturales Oceánicos") is the IEO fisheries and oceanographic Database.

International database:

RDB (Regional Data Base)
InterCatch (ICES areas)

Quality checks and data validation documentation:

Manual SIRENO
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)

AR comment: No deviations or developments.

Sample storage

Storage description:

Otoliths collected on board are kept duly labelled waxed paper envelopes and later in the laboratory they are classified and stored in boxes for each sampled trip before reading.

Gonads collected on board are kept in micro-perforated duly labelled plastic bags that are fixed in formaldehyde solution using a special mask during sample handling.

At the lab, ovary samples are stored in 70º alcohol, in outdoor storage rooms located at CO of Vigo. Due to lack of space, only a sample of the gonads that may be of interest for further studies are kept. On the other hand, all of the histological sections and slides are stored. The collection is in the CO of Vigo.

Sample analysis:

Age

Otoliths reading and age estimation follow the agreements and recomendations of related workshops.

Maturity

To improve the quality of the maturity data, a workshop is held annually to review the different maturity stages of the main bony fish species, and of sharks and rays both oviparous and ovoviviparous. Maturity manuals for each of the species are available onboard to scientific observer. Each maturity stage characteristics are explained and illustrated with photographs taken of individuals of different sizes sampled. The gonad is shown inside the fish as seen in biological sampling, and also outside the fish and in detail.
Manual ESP_IEO_P5_AtSea_Maturity (Spanish)
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)
ICES WK and WG documents related to biological parameters
http://ices.dk/community/Pages/PGCCDBS-doc-repository.aspx

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N

Documentation will be available at the end of 2022.

The refusal rate in the last years has been zero because each fishing license is linked to the acceptance of scientific observer on board.

The observer programs on board have manuals and protocols that define the objectives and tasks.

The methodology used to improve the data quality include the next tools:

- Exploratory data analysis to detect outliers and errors from hauls, catches, length and biological sampling.
- Plotting hauls positions: checking the allocation of geographic strata.
- Checks of CPUEs.
- Scatter plots of length and biological samplings.
- SOP factor of length / weight for biological samplings.
- SOP factor of sample weights to identify errors and quantify the quality of the sampling.
- Tools of the ESP_IEO_P5_AtSea software and script in R for the calculation of uncertainty for raising.
- Estimation of the biological parameters and their uncertainties carried out using the tool INBIO 2.0 ("Estimation of biological parameters and their uncertainties through simulation techniques"), developed in R environment by the IEO.

In addition, quality controls are also performed:

Implementation of sampling protocols for each species where the methodologies of sampling, processing and storage of samples are described.

Processing, debugging and periodic checking of data.

Standardization of the common criteria in assigning maturity and age of each species, in order to improve the accuracy

Attendance to workshops and/or exchanges between different scientific teams

Editing and imputation methods:

N

Documentation will be available at the end of 2022

Typing errors of sample data are corrected or excluded.

Outliers and poor quality sampling data are excluded.

Extrapolations to others temporal and geographical strata (months, areas,..) when data is lacking.

Quality document associated to a dataset:

N

Validation of the final dataset:

The final length distribution of the population is checked with the comparison of SOP value of the length distribution and the landing weight for all sampling frames.

Biological parameters are checked in R INBIO 2.0.

In general, for each fishery, final datasets are validated taking into account the guidelines and formats of the data calls for the end users, mainly assessment Working Groups and NAFO, ICES and RCGs:

RFMO	Sampling frame identifier	Area	End User
NAFO	OTB_MDD_40-60-130-280	NAFO Div. 3LMNO	NAFO SC, RCG LDF?
ICES	OTB_DWS_100-129	ICES 12, 6b1	WGDEEP, RCG NANSEA
ICES	OTM_DEF_100-119	ICES 12, 14	NWWG, RCG NANSEA
ICES	OTM_DEF_100-119	ICES 1-2	AFWG, RCG NANSEA
ICES	OTB_DEF_>=120	ICES 1-2	AFWG, RCG NANSEA

AR comment: No deviations or developments.

ESP_IEO_P5_AtSea-CCAMLR

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: Other Regions (CCAMLR)

Sampling scheme identifier: ESP_IEO_P5_AtSea_CCAMLR

Sampling scheme type: Commercial and exploratory fishing trip

Observation type: SciObsAtSea

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
The sampling scheme aims to collect at sea fishing data, catch composition (all fractions) and biological parameters from exploratory and commercial trips operating in CCAMLR waters
Sampling is concurrent but observer's priority is to sample target species (*Dissostichus mawsoni* and *Dissostichus eleginoides*) and bycatch (Macrourids and others).
Observers record information on the gear configuration (including measures to reduce incidental mortality of seabirds and marine mammals), fishing operations (including catch composition), biological measurements of target and by-catch species, details of fish tagging and tag-recaptures, vessel sightings and data on indicators of vulnerable marine ecosystems. All of these data are submitted by observers to the CCAMLR Secretariat on standardised logbook forms designed for longline, trawl (finfish and krill) and pot (crabs and finfish) fisheries.

Description of the population

Population targeted:
The primary sampling unit (PSU) is the vessel trip, that is sampled onboard the Spanish logline fleet (LLS) operating in CCAMLR Regulatory Area.

Population sampled
The target population: Toothfish (Dissostichus spp) stocks in subareas 88.1 and 48.6.
Fishing trips occur in the austral summer (Nov-March) due to the ice condition, unsuitable in other periods.

Stratification:
For management purposes there are differentiate stocks in both subareas. Subarea 88.1 is an exploratory fishery while subarea 48.6 is a poor-data area therefore a research plan is needed. During the same trip (PSU), the vessel operates in several subareas.
For these reasons, the following sampled population have been described with a similar sampling plan:

Region	RFMO	Sampling frame identifier	Area
Other Regions	CCAMLR	ESP_IEO_P5_AtSea_CCAMLR	CCAMLR subarea 88.1
Other Regions	CCAMLR	ESP_IEO_P5_AtSea_CCAMLR	CCAMLR subarea 48.6

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
All fishing vessels have two observers onboard, one International and the other National. The International observer is selected following the SISO (Scheme of International Scientific Observation) protocol:
https://www.ccamlr.org/en/document/publications/text-ccamlr-scheme-international-scientific-observation.
Method of PSU selection: According to CCAMLR Conservation Measures, it is compulsory to sample all fishing vessels.
The SSU is the fishing haul and is randomly selected.
The method to collect data from commercial fisheries is the concurrent sampling on board carried out by two observers at-sea who remain on board throughout for the entire fishing trip (4-5 months).

Observers at sea collect data on unsorted catch, bycatch and discards following the SISO manual : https://www.ccamlr.org/en/document/science/scientific-observers-manual-%E2%80%93-finfish-fisheries-%E2%80%93-version-2020
An Observer sampling requirements for *Dissostichu*s spp. can be found on the CCAMLR website: https://www.ccamlr.org/en/science/observer-sampling-requirements-dissostichus-spp
The biological parameters (Weight, sex, Maturity) come from a randomly collected sampling design.
The data for the estimation of discards and catch structure consist on length data and weight sampled. Raisings are done for each species to the total catch of the fishery.
Tag/recapture data is essential for stock assessment using CASAL package developed in the R environment. A tagging rate is set, which is different depending on the area:
https://www.ccamlr.org/en/document/science/toothfish-and-skate-tagging-methods
Other biological parameters are estimated in the laboratories, such as the age estimation that is based on otolith readings from samples collected on board.

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

Y

Regional coordination:

N

Link to sampling design documentation:

https://www.ccamlr.org/en/document/science/scientific-observers-manual-%E2%80%93-finfish-fisheries-%E2%80%93-version-2020

Compliance with international recommendations:

Y

Link to sampling protocol documentation.

https://www.ccamlr.org/en/science/information-technical-coordinators-and-scientific-observers
https://www.ccamlr.org/en/document/publications/text-ccamlr-scheme-international-scientific-observation

Compliance with international recommendations:

Y

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

There are two observers on board, following the SISO requirements, one of which is international while the other is national. Usually they work onboard in 12-hour shifts.
The training of the National observer is carried out by technicians from the IEO (Spanish Institute of Oceanography). The International observer is trained following the SISO programme.
A national coordinator is appointed by CCAMLKR from each Party.
Observers collect the data manually and process it on a laptop on a daily basis.
The data collected is monitored through periodic emails between observers and coordinators.
Once the observer returns to port, 5 working days are devoted to review the data and samples collected, codification of photographs and to finish the observer report.
Sampling needs are reviewed monthly.
The vessel operating in this area has permissions for fishing only with set bottom long line (PSU) for commercial and exploratory fishing. The sampling is planned in advance. Usually the number of samples from the research proposals in subarea 48.6 is higher as the aim is to obtain the maximum data to be able to carry out the stock assessment as soon as possible.
They could be different causes of deviation of the sampling planned, being the main the “ice condition”. When the concentration of the ice is high the vessel cannot work. An additional cause of deviation could be that the vessel runs out of oil, having to shorten the campaign.
It is important to improve coordination with the sectors involved: owners and administration authorities.

AR comment: No deviations or developments.

Data capture

Means of data capture:

Data are recorded daily by the observers at sea on a laptop using the CCAMLR forms

- Fishing Forms.
- Catches Forms.
- Biological Sampling Forms.
- Tag and recovery forms
- Others Forms (VME Indicators, Incidental Catches)

Length data is collected using a measuring board for fish.

Weight data is collected using marine scales (20 kg) mainly.
Other parameters as sex and maturity data are collected “de visu” according with the SISO manual.
https://www.ccamlr.org/en/node/74773.
Pics of VME taxa indicators and incidental by catch are taken by observers using a camera.
A tagging protocol is in place.

Data capture documentation:

Longline fisheries data and cruise report forms
https://www.ccamlr.org/en/node/74773
Instructions for sampling protocols and methods
https://www.ccamlr.org/en/science/information-technical-coordinators-and-scientific-observers
CCAMLR data forms
https://www.ccamlr.org/en/data/forms
By-catch identification and educational material for use by observers on vessels
https://www.ccamlr.org/en/document/science/common-catch-species-ccamlr-longline-and-trawl-fisheries
https://www.ccamlr.org/en/document/publications/fishes-ross-sea-region-%E2%80%93-field-guide-common-species-caught-longline-fishery
https://www.ccamlr.org/en/document/science/dissostichus-eleginoides-gonade-maturity-guide
VME-taxa-classification-guide
https://www.ccamlr.org/en/document/publications/vme-taxa-classification-guide
Other training materials for observers
https://www.ccamlr.org/en/document/science/seabird-identification-%E2%80%93-photographic-guide-observers-sea-southern-indian-ocean
https://www.ccamlr.org/en/document/science/whale-depredation-%E2%80%93-data-collection-guidelines
https://www.ccamlr.org/en/science/observer-self-training-guide

Quality checks documentation:

Y
Data collected and recorded on board of each trip are checked during and after the trip (in the laboratory) in order to detect errors and inconsistencies (detection of outliers, SOP of the length distributions, ranges of variables, etc.)
After the trip, the observer debugs all data, haul by haul and samples. Finally, a random check of about 15% of the data is carried out to validate the quality of the results. Annually all sets of data for each fishery are checked to be used for assessment and other scientific tasks by members and CCAMLR Secretariat.

AR comment: No deviations or developments.

Data storage

National database:

NA

International database:

CCAMLR Secretariat hosts the Database:
https://www.ccamlr.org/en/data/data

Quality checks and data validation documentation:

CCAMLR Secretariat validates the data together with the National coordinators that are the owners of the data.

AR comment: No deviations or developments.

Sample storage

Storage description:

Otoliths collected on board are kept duly labelled in waxed paper envelopes and later in the laboratory they are classified and stored in boxes for each sampled trip.

Sample analysis:

Age
There is a link to a otolith library with a repository of images in order to validate other readings:
https://www.ccamlr.org/en/science/otolith-library
Maturity
Maturity indexes are in the SISO manual. Each maturity stage characteristics are explained and illustrated with photographs taken of individuals of different sizes. The gonad is shown both inside the fish as seen in biological sampling and outside the fish.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N
Documentation will be available at the end of 2022.
The refusal rate in the past years is zero because each fishing license is linked to the acceptance of the two scientific

observers on board.
The observer programs on board have manuals and protocols that define the objectives and working tasks.
The methodology used to improve the data quality include the next tools:

- Exploratory data analysis to detect outliers and errors from hauls, catches, length and biological sampling.
- Plotting hauls positions: checking the allocation of geographic strata.
- Checks of CPUEs.
- Checks of Species taxa.
- Scatter plots of length and biological samplings.
- SOP factor of length / weight for biological samplings.
- SOP factor of sample weights to identify errors and quantify the quality of the sampling.

Editing and imputation methods:
N
Documentation will be available at the end of 2022
Typing errors of sample data are corrected or excluded.
Outliers and poor quality sampling data are excluded.
Quality document associated to a dataset:
N
Validation of the final dataset:
The final validation is made between the CCAMLR Secretariat and the National coordinator. Every outlier/potential error is getting back to the coordinator who checks the data together with the observer.

AR comment: No deviations or developments.

FCGS

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS:ESP

Region: Other Regions

Sampling scheme identifier:FCGS

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):

The objective of the survey is to know the stock status of target species: their abundance, biomass and demographic structure and the hydrographical and environmental conditions on the Flemish Cap Bank (NAFO Division 3M).

Description of the population

Population targeted:

Target species: Cod (*Gadus morhua*), Redfish (*Sebastes mentella*, *S. fasciatus* and *S. norvegicus*), American plaice (*Hippoglossoides platessoides*), Greenland halibut (*Reinhardtius hippoglossoides*), Roughhead grenadier (*Macrourus berglax*) and Northern shrimp (*Pandalus borealis*)

Area: Flemish Cap Bank (NAFO Regulatory Area Division 3M). Flemish Cap is entirely outside any 200-mile EEZ, and the exploitation of its resources is regulated by the NAFO.

Dates: The survey starts in the second half of June, and needs 35 days at sea.

Population sampled:

All fish, cephalopods, shrimp and non-commercial invertebrates.

Flemish Cap is an isolated bank on the American continental shelf, with an approximated surface of 17 000 squared nautical miles within the 1460 m (800 fathoms) isobath and 10 555 within the 730 m (400 fathoms). Flemish Pass, an area deeper than 1000 m, separates it from the Newfoundland Grand Bank and gives it its isolated character by limiting the migration of many species, particularly those occurring in the shallowest zones.

The trawling gear used is the Lofoten and the cod-end mesh size is 35 mm. An auxiliary net bag of 10 mm mesh size is used to retain the youngest individuals of shrimp escaping throw an small square of the cod-end

Stratification:

Random stratified survey of the Flemish Cap area until 1460 m (800 fathoms) depth, making 181 bottom trawl hauls with a Lofoten fishing gear, at daytime: between 6:00 and 22:00, and 30 minutes effective fishing time.

The adopted stratification of Flemish Cap (Table 1) considers 19 strata up to 730 m (400 fathoms) depth. Stratification was later extended to cover up to 1460 m (800 fathoms) depth, considering 39 strata. Two strata of this bank (numbers 26 and 27) have fishing grounds unsuitable for trawling due to the huge abundance of sponges, and the same goes for the five strata belonging to the Beothuk Knoll (numbers 35–39) due, presumably, to the massive presence of corals.

All these strata have been removed from the survey, resulting in the current 32 strata surveyed. Each stratum is divided in rectangles of equal area. i.e. the number of rectangles is proportional to the stratum area. A total of 478 rectangles are therefore considered in the current survey design. Each rectangle is in turn divided in 10 fishing units of equal area, leading to 4780 possible bottom trawl fishing hauls.

Table 1. Specification and characteristics of the survey area, and number of selected hauls.

	Area sq. miles	Strata	Rectangles	Fishing units	Selected hauls
depth < 730 m	10 555	19	309	3 090	120
depth: 730–1 460 m	5 515	13	169	1 690	61
Total	16 070	32	478	4 780	181

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:

Type of survey

Bottom trawl fishing hauls that lasting for 30 minutes and are distributed using a stratified random sampling scheme The trawling gear used is the Lofoten. Temperature and salinity profiles are taken with a CTD according to a predefined square grid. The survey starts in the second half of June, and needs 35 days at sea.

Trawl station methodology

181 hauls will be selected at random, 120 of them in less than 730 m depth.

The selection of the hauls is set with the following conditions:

- The number of hauls in each stratum is fixed, distributed proportionately to the number of units, and ensuring at least two hauls by stratum.
- Hauls (fishing units) are randomly chosen within each stratum with the following constrains: only one haul can be selected within a given rectangle, and two hauls cannot coincide in adjacent fishing units.
- Information from previous surveys and commercial fishing is used to eliminate hauls in unsuitable fishing grounds.
- The allocation of the hauls into each fishing unit could be made more accurate using the bathymetry of the area obtained by the NEREIDA project, reducing the risks of snagging in the bottom.

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

NA

Regional coordination:

No. There is not signed agreement about task sharing.

The survey is carried out by Spain and Portugal and annually there is a joint coordination meeting ad hoc for this survey. (FCCM)

Spain contributes with vessel, staff and samples analysis in laboratory and Portugal contributes with staff and samples analysis in laboratory.

Link to sampling design documentation:

https://archive.nafo.int/open/studies/s46/S46.pdf

Compliance with international recommendations:

Y

Link to sampling protocol documentation

https://archive.nafo.int/open/studies/s46/S46.pdf

Compliance with international recommendations:

Y

The results of the survey are used by the NAFO Scientific Council to make an assessment on the state of the resources, which is the key tool for the NAFO Commission to take the appropriate management measures.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

The criterion used to change the position of a previously selected random haul has always been the information from the commercial fishing and from previous surveys about the suitability of the bottom trawling. This information is contrasted with the more detailed bathymetric charts of the bottom that have been developed in the project NEREIDA.

Criteria for rejecting a haul:

- Snag of the trawling gear in the bottom.
- Damages in the cod-end or severe damages in large sections of the wings or belly.
- Less than 20 minutes of effective trawling time.
- Gear malfunction, i.e., when it is considered that gear contact with bottom was not correct, or the geometry of the gear was not maintained properly through the whole trawl.

Rejected fishing hauls means that, because standard conditions were not achieved, such station cannot be used to quantify the biomass and abundance neither to determine the structure of the population. However, the specimens caught in any non-valid hauls can be used to make all kind of biological sampling.

The order of execution of selected stations is determined during the survey, setting each day the hauls to be held the next day, trying to minimize the routes between stations.

A detailed plan of the order of the stations is impractical because it is necessary to make changes due to unforeseen malfunction of the gear (e.g. obstruction, breakages…).

The distance travelled in each haul is the geographical distance between the GPS positions of the start of the haul (when the gear comes into contact with the bottom and it acquires its characteristic shape) and the start of the haulin (when cable starts to be recovered).

The development of the survey depends on the weather conditions and other factors (breakdowns, gear damages, etc.), so that the final fishing plan is decided on board day to day in order to optimize the use of the working day.

Every year, issues about logistic, sampling plan and protocols are discussed in the coordination meeting (FCCM) (Mar-Apr) previously to the survey (Jun-Jul)

AR comment: No deviations or developments.

Data capture

Means of data capture:

Trawl hauls

The trawling gear used is the Lofoten and the the cod-end mesh size is 35 mm. An auxiliary net bag of 10 mm mesh size is used to retain the youngest individuals of shrimp escaping throw an small square of the cod-end.

ScanMar and, ITI sensors are used to monitor the gear.

Fishing hauls and Catch Record. A haul's data form is filled in each set. It will contain information gathered in the bridge during and immediately after finishing the haul, as well as catch information by species. This form is available in the sampling area before sorting the catch starts. There are two forms, one for depth < 700 m. and another one for > 700 m. There is a space reserved for sums and calculations. Catch record. All fish species, as well the commercial cephalopods and crustacean are recorded.

Biological data

Length sampling. The length frequency of each species is recorded in separated data forms. Length measurements are made by at least two persons, so that always a person measure and other records. The lengths shall be recorded in the appropriate data form for this purpose After the measurement, it is clearly indicated the beginning and end of the size range and measures are counted and registered the total number of individuals measured by size. For species with sex discrimination, frequencies are recorded in separate columns with indication of the sex on headings.

Biological sampling. In each haul a full biological sampling is done for the most of target species by two observers and always a person measure and other writes down data in the form. Control sheets for each species are available at the beginning of each day based on data collected from previous hauls.

Length data is collected using a measuring board for fish and cephalopods species. For crustaceans, sampling is made using a digital caliper connected to a laptop that records length data automatically to an Excel file.

Weight data is collected using marine scales.

Stomach contents

Stomach sampling. This sampling is done every two years as a minimum, and it is under the exclusive task of two observers that always a person measure and other records data in a specific form. Sampling data is recorded in a specific software of the Trophic Relationships.

Benthos in the trawl

Benthonic invertebrates. Non-commercial invertebrates, sponges and corals among them, are recorded in a specific data form. Catch records are written down in a specific data form where weight and number of each best identified group is noted, as well as any observation. A photographic record is made of the whole invertebrate catch.

Litter items

Marine litter data is registered and written down in the haul´s form for their classification according to the established code. In addition, a photographic record of it is made.

Hydrography-CTD

Temperature and salinity profile using a CTD. The files generated in each station * .hex must be checked and converted to ASCII files by means of the SBD data processing program.

All survey data are captured using specific recording specific paper forms.

All data recorded during the survey are entered in a computer as soon as possible, as data is validated and potential errors corrected in an easy way. The data collected each day is always inputted before the next day work starts, to allow updating control of samples already taken.

After stored, data from each fishing haul will be printed to verify that the stored information is equal to that in the forms. Printing formats should be similar to that of the forms in use.

Data are stored and initially managed in an ad hoc software called ARGO. The system provides a reliable way of data storage and elaboration of results, as well as the possibility of transferring data to any other programs.

Once they are corrected, they are transferred to the shared database SIRENO, which is managed by the IEO.

Data capture documentation:

https://archive.nafo.int/open/studies/s46/S46.pdf

Survey Plan FCGS 2021 (Spanish)

http://www.ieo.es/es_ES/web/ieo/pndb. (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)

Quality checks documentation:

https://archive.nafo.int/open/studies/s46/S46.pdf

(See: Validation of Survey Results, pg 14)

All data recorded during the survey are entered in a computer as soon as possible, data is validated and potential errors corrected in an easy way. The data collected each day is always inputted before the next day work starts, to allow updating control of samples already taken.

After stored, data from each fishing haul will be printed to verify that the stored information is equal to that in the forms.

Printing formats should be similar to that of the forms in use.
Data are stored and initially managed in an ad hoc program, ARGO. The system provides a reliable way of data storage and elaboration of results, as well as the possibility of transferring data to any other programs.
Once they are corrected, they are transferred to the shared database SIRENO, which is managed by the IEO.

AR comment: No deviations or developments.

Data storage

National database:
National Database: SIRENO (IEO)
Survey Database: ARGO (IIM-CSIC)
Sstomach contents: DataBase Trophic Relationships (IEO)
International database:
VME Indicators: ICES VME database (http://vme.ices.dk)
Hydrography-CTD: IODE/SeaDataNet
Quality checks and data validation documentation:
https://archive.nafo.int/open/studies/s46/S46.pdf
(See: Validation of Survey Results, pg 14)
All data recorded during the survey are entered in a computer as soon as possible, as data is validated and potential errors corrected in an easy way. The data collected each day is always inputted before the next day work starts, to allow updating control of samples already taken.
After stored, data from each fishing haul will be printed to verify that the stored information is equal to that in the forms. Printing formats should be similar to that of the forms in use.
Data are stored and initially managed in an ad hoc program, ARGO. The system provides a reliable way of data storage and elaboration of results, as well as the possibility of transferring data to any other programs.
Once they are corrected, they are transferred to the shared database SIRENO, which is managed by the IEO.

AR comment: No deviations or developments.

Sample storage

Storage description:
Age
Otoliths collected on board are kept duly labelled waxed paper envelopes and later in the laboratory they are classified and stored in boxes for each species before reading.
Maturity
Gonads collected on board are kept in micro-perforated duly labelled plastic bags that are fixed in formaldehyde solution using a special mask during sample handling. Gonads on board are kept in containers by species.
At the lab, ovary samples are stored in 70º alcohol, in outdoor storage rooms located at labs. . Due to lack of space, only a sample of the gonads that may be of interest for further studies are kept. On the other hand, all of the histological sections and slides are stored.
The samples of otoliths and gonads are stored in the three Institutes of MS participants: IEO and IIM-CSIC (Vigo, Spain) and IPMA (Lisbon, Portugal) in according of the task sharing by species.
Shrimp (*Pandalus borealis*) samples
Additional samples are taken for study in laboratory to calculate the length-weight relationship. These samples are frozen on board. Samples are taken from all strata. After the survey samples are stored in freezers at the lab (IEO: C.O. Vigo) until they are sampled.
Benthonic invertebrates
All specimens of less frequent species are retained, particularly those from species not included in the invertebrates' identification cards or those with uncertain or incomplete classification. Samples are stored in plastic bags, labelled with survey, haul and species, and they are preserved in the appropriate conservation media.(alcohol and formalin).
Taxonomy
If some species are not identified on board, individuals are labelled, frozen and stored in boxes for their study in the lab. After the survey samples are stored in freezers at the lab (IEO: C.O. Vigo) until they are identified by experts.
Sample analysis:
To improve the quality of the maturity data, a workshop is held prior to the surveys in NAFO waters to review the different maturity stages of the main bony fish species, and of sharks and rays both oviparous and ovoviviparous.
Maturity manuals for each of the species are available onboard to scientific staff for each species. Each maturity stage characteristics are explained and illustrated with photographs taken of individuals of different sizes sampled in the study area. The gonad is shown inside the fish as seen in biological sampling, and also outside the fish and in detail. Those stages for which photographs of individuals captured in the study area are not available are illustrated with photographs of the reports of the ICES maturity workshops that were carried out for the correspondent species.
https://archive.nafo.int/open/studies/s46/S46.pdf
Manual ESP_IEO_P5_AtSea_Maturity (Spanish)
http://www.ieo.es/es_ES/web/ieo/pndb. (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)

Survey Plan FCGS 2021 (Spanish) http://www.ieo.es/es_ES/web/ieo/pndb. (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)
AR comment: No deviations or developments.
Data processing
Evaluation of data accuracy (bias and precision): Y https://archive.nafo.int/open/studies/s46/S46.pdf (See: Data analysis, pg 13) **Editing and imputation methods:** Y https://archive.nafo.int/open/studies/s46/S46.pdf (See: Data analysis, pg 13) **Quality document associated to a dataset:** N **Validation of the final dataset:** Final datasets are validated taking into account the guidelines and formats of SC- NAFO. https://archive.nafo.int/open/studies/s46/S46.pdf (See: Validation of Survey Results, pg 14)
AR comment: No deviations or developments.

PLATUXA_ESP

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS:ESP

Region: Other Regions

Sampling scheme identifier:PLATUXA_ESP

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):

The main objectives of the survey are the estimation of abundance and biomass index of the target species, as well as the knowledge of their population demographic structure and the oceanographic conditions on the Grand Bank (NAFO Regulatory Area Div. 3NO and 3L).

The survey is divided in two parts:

- 1st part Div 3NO. National Name of the research survey: Platuxa
- 2nd part Div 3L. National Name of the research survey: Fletán Negro 3L

Description of the population

Population targeted:

1st part Div 3NO: Platuxa

Target species: Cod (*Gadus morhua*), Redfish (*Sebastes spp.),* American plaice (*Hippoglossoides platessoides*), Yellowtail flounder (*Limanda ferruginea*), Witch flounder (*Glyptocephalus cynoglossus*), Black dogfish (*Centroscyllium fabricii*), Thorny skate (*Amblyraja radiata*); White hake (*Urophycis tenuis*), Greenland halibut (*Reinhardtius hippoglossoides*), Northern shrimp (*Pandalus borealis*), Roughhead grenadier (*Macrourus berglax*) and Shortfinned squid (*Illex Illecebrosus*).

Area: NAFO Regulatory Area Div. 3NO.

Dates: The survey starts in the second half of May, and needs 30 days at sea including sailing days.

2nd part Div 3L: Fletán Negro 3L

Target species: Cod (*Gadus morhua*), Redfish (*Sebastes spp.),* American plaice (*Hippoglossoides platessoides*), Witch flounder (*Glyptocephalus cynoglossus*), Thorny skate (*Amblyraja radiata*), Greenland halibut (*Reinhardtius hippoglossoides*), Northern shrimp (*Pandalus borealis*), Roughhead grenadier (*Macrourus berglax*) and Bllack dogfish (*Centroscyllium fabricii*)

Area: NAFO Regulatory Area Division 3L (Flemish Pass).

Dates: The survey starts in the second half of July, and needs 28 days at sea including sailing days

The area of both surveys is entirely outside any 200-mile EEZ, and the exploitation of its resources is regulated by the NAFO.

Population sampled:

All fishes, cephalopods, shrimp and non-commercial invertebrates.

The 1st part of the survey (Platuxa) is carried out between the lines of the Canadian EEZ and 46º 00´N and 46º 30´W. The depth range of the fishing hauls is from 57 to 1281 m.

The 2nd part of the survey (Fletán Negro 3L) is carried out between the lines of the Canadian EEZ and 46º 00´N and 48º 30´W. The depth range of the fishing hauls is from 93 to 1463 m.

The trawling gear used is a Campelen 1800 type and the cod-end mesh size is 44 mm.

Stratification:

Apart from the geographical and temporal stratification described in the section "Population targeted"

The stratification reflects the bathymetric profile of the Bank, with large strata in the shallow area and very narrow strata in

the cliff. The strata are divided into units with an approximate area of 35 nm2, which in turn are divided into 10 cells of about 3 nm2. These cells are the units on which the sampling is based.
Depending on the extent of each stratum, between 2 and 20 cells per stratum are randomly selected for fishing hauls. For the subsequent statistical analysis of the data, it is essential that there be a minimum of two hauls per stratum.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
Type of survey
Stratified random sampling scheme, diurnal Bottom trawl fishing hauls from 6 am to 9.30 pm with an average hauling time of 30 minutes. The trawling gear used is the 'Campelen 1800'. Hydrographic profiles by haul are taken with a CTD.
Trawl station methodology
The selection of the hauls is set with the following conditions:

- The number of hauls in each stratum is fixed, distributed proportionately to the number of units, and ensuring at least two hauls by stratum.
- Hauls (fishing units) are randomly chosen within each stratum with the following constrains: only one haul can be selected within a given rectangle, and two hauls cannot coincide in adjacent fishing units.
- Information from previous surveys and commercial fishing is used to eliminate hauls in unsuitable fishing grounds.
- The allocation of the hauls into each fishing unit could be made more accurate using the bathymetry of the area obtained by the NEREIDA project, reducing the risks of snagging in the bottom.

Is the sampling design compliant with the 4S principle?:
NA
Regional coordination:
No
Link to sampling design documentation:
Manual: Protocol 3LNO Surveys (Spanish).
Compliance with international recommendations:
Y
The results of the survey are used by the NAFO Scientific Council to make an assessment on the state of the resources, which is the key tool for the NAFO Commission to take the appropriate management measures.
Link to sampling protocol documentation:
Manual: Protocol 3LNO Surveys (Spanish).
Compliance with international recommendations:
Y
The results of the FCGS are used by the NAFO Scientific Council to make an assessment on the state of the resources, which is the key tool for the NAFO Commission to take the appropriate management measures.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA
Monitoring of sampling progress within the sampling year:
The fishing hauls plan to be carried out during each annual survey is planned prior to it. However, the progress of the survey may require some changes in the planned hauls.
Moving any of the hauls initially planned in the fishing plan is acceptable as long as the number of hauls per stratum is maintained. For statistical reasons, in extreme situations that impede the normal development of the survey and force the elimination of hauls, it is necessary to try to achieve a minimum of two hauls per stratum, being preferable to leave some strata unsampled rather than having only one sample per stratum. If the situation permits, the elimination of strata from the fishing plan should take into account the hauls in previous years in these strata, so that the strata eliminated are those with the least annual variability.
The fishing hauls are standardized, and to be valid they require a speed of 3.0 knots and an effective trawl duration of 30 minutes, controlled by the sensors located on the rig and the doors (SCANMAR and ITI). The start point is defined as the point when the vertical and horizontal openings of the gear stabilize after having made firm. Fishing ends when the gear loses contact with the bottom.
Criteria for rejecting a haul:

- Snag of the trawling gear in the bottom.
- Damages in the cod-end or severe damages in large sections of the wings or belly.
- Less than 20 minutes of effective trawling time.
- Gear malfunction

The development of the survey depends on the weather conditions and other factors (breakdowns, gear damages, etc.), so that the final fishing plan is decided on board day to day in order to optimize the use of the working day.

AR comment: No deviations or developments.

Data capture

Means of data capture:

Trawl hauls

The trawling gear used is the Campelen 1800 type and the cod-end mesh size is 44 mm ScanMar and, ITI sensors are used to monitor the gear.

Fishing hauls and Catch Record. A haul's data form is filled in each set. It will contain information gathered in the bridge during and immediately after finishing the haul, as well as catch information by species. This form is available in the sampling area before sorting the catch starts. Catch record. All fish species, as well the commercial cephalopods and crustacean are recorded.

Biological data

Length sampling. The length frequency of each species is recorded in separated data forms. Length measurements are made by at least two persons, so that always a person measure and other records. The lengths shall be recorded in the appropriate data form for this purpose After the measurement, it is clearly indicated the beginning and end of the size range and measures are counted and registered the total number of individuals measured by size. For species with sex discrimination, frequencies are recorded in separate columns with indication of the sex on headings.

Biological sampling. In each haul a full biological sampling is done for the most of target species by two observers and always a person measure and other writes down data in the form.

Control sheets for each species are available at the beginning of each day based on data collected from previous hauls.

Length data is collected using a measuring board for fish and cephalopods species. For crustaceans, sampling is made using a digital caliper connected to a laptop that records length data automatically to an Excel file.

Weight data is collected using marine scales.

Stomach contents

Stomach sampling. This sampling is done every two years as a minimum, and it is under the exclusive task of two observers that always a person measure and other records data in a specific form. Sampling data is recorded in specific software of the Trophic Relationships.

Benthos in the trawl

Benthonic invertebrates. Non-commercial invertebrates, sponges and corals among them, are recorded in a specific data form. Catch records are written down in a specific data form where weight and number of each best identified group is noted, as well as any observation. A photographic record is made of the whole invertebrate catch.

Litter items

Marine litter data is registered and written down in the haul´s form for their classification according to the established code. In addition, a photographic record of it is made.

Hydrography-CTD

Temperature and salinity profile using a CTD. The files generated in each station * .hex must be checked and converted to ASCII files by means of the SBD data processing program.

All survey data are captured using specific recording specific paper forms.

All data recorded during the survey are entered in a computer as soon as possible, as data is validated and potential errors corrected in an easy way. The data collected each day is always inputted before the next day work starts, to allow updating control of samples already taken.

After stored, data from each fishing haul will be printed to verify that the stored information is equal to that in the forms. Printing formats should be similar to that of the forms in use.

Data are stored and initially managed in ad-hoc software called LEJANAS.CAM. The system provides a reliable way of data storage and elaboration of results, as well as the possibility of transferring data to any other programs.

Once they are corrected, they are transferred to the shared database SIRENO, which is managed by the IEO.

Data capture documentation:

Protocol 3LNO Surveys (Spanish)

Survey Plan Platuxa 2021 (Spanish)

Survey Plan FN3L 2019 (Spanish)

http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)

Quality checks documentation:

Protocol 3LNO Surveys (Spanish)

Survey Plan Platuxa 2021 (Spanish)

Survey Plan FN3L 2019 (Spanish)

http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)

All data recorded during the survey are entered in a computer as soon as possible, data is validated and potential errors corrected in an easy way. The data collected each day is always inputted before the next day work starts, to allow updating control of samples already taken.

After stored, data from each fishing haul will be printed to verify that the stored information is equal to that in the forms. Printing formats should be similar to that of the forms in use.

Data are stored and initially managed in an ad hoc software LEJANAS.CAM. The system provides a reliable way of data

storage and elaboration of results, as well as the possibility of transferring data to any other programs.
Once they are corrected, they are transferred to the shared database SIRENO, which is managed by the IEO.

AR comment: No deviations or developments.

Data storage

National database:
National Database: SIRENO (IEO)
Survey Database: ARGO (IIM-CSIC)
Sstomach contents: DataBase Trophic Relationships (IEO)
International database:
VME Indicators: ICES VME database (http://vme.ices.dk)
Hydrography-CTD: IODE/SeaDataNet
Quality checks and data validation documentation:
All data collected is recorded on specific paper forms and then it is recorded in the computer system as described previously. The verification of the stored data follows the following steps:
1. The data of each fishing haul, once recorded, are listed to verify that the data indicated is the same as that which appears in the forms. For this, complete lists with formats similar to each of the forms will be available.
2. At the end of the survey: the length-weight ratio of each species is updated and possible discrepancies between length and weight are checked. If the discrepancy is due to a rectifiable error, it will be corrected in the original form in another colour, to recognize the original item and the corrected.
3. For each species, using the best available length-to-weight ratio, the weight of the sample corresponding to each of the length measurements is recalculated. The discrepancies between the indicated sample weight and the recalculated weight cannot be greater than 15%.
The results of the survey are presented annually to the NAFO Scientific Council in several documents.
Protocol 3LNO Surveys (Spanish)
Survey Plan Platuxa 2021 (Spanish)
Survey Plan FN3L 2019 (Spanish)
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)

AR comment: No deviations or developments.

Sample storage

Storage description:
Age
Otoliths collected on board are kept duly labelled waxed paper envelopes and later in the laboratory they are classified and stored in boxes for each species before reading.
Maturity
Gonads collected on board are kept in micro-perforated duly labelled plastic bags that are fixed in formaldehyde solution using a special mask during sample handling. Gonads on board are kept in containers by species.
At the lab, ovary samples are stored in 70º alcohol, in outdoor storage rooms located at labs. Due to lack of space, only a sample of the gonads that may be of interest for further studies are kept. On the other hand, all of the histological sections and slides are stored.
The samples of otoliths and gonads are stored in the lab (IEO: C.O. Vigo)
Shrimp (*Pandalus borealis*) samples
Additional samples are taken for study in laboratory to calculate the length-weight relationship. These samples are frozen on board. Samples are taken from all strata. After the survey samples are stored in freezers at the lab (IEO: C.O. Vigo) until they are sampled.
Benthonic invertebrates
All specimens of less frequent species are retained, particularly those from species not included in the invertebrates' identification cards or those with uncertain or incomplete classification. Samples are stored in plastic bags, labelled with survey, haul and species, and they are preserved in the appropriate conservation media.(alcohol and formalin) and kept in containers. The samples are stored in the lab (IEO: C.O. Vigo) to be sampled by experts.
Taxonomy
If some species are not identified on board, individuals are labelled, frozen and stored in boxes for their study in the lab. After the survey samples are stored in freezers at the lab (IEO: C.O. Vigo) to be sampled by experts.
Sample analysis:
To improve the quality of the maturity data, a workshop is held prior to the surveys in NAFO waters to review the different maturity stages of the main bony fish species, and of sharks and rays both oviparous and ovoviviparous.
Maturity manuals for each of the species are available onboard to scientific staff for each species. Each maturity stage characteristics are explained and illustrated with photographs taken of individuals of different sizes sampled in the study area. The gonad is shown inside the fish as seen in biological sampling, and also outside the fish and in detail. Those stages for which photographs of individuals captured in the study area are not available are illustrated with photographs of the reports of the ICES maturity workshops that were carried out for the correspondent species.

Protocol 3LNO Surveys (Spanish)
Survey Plan Platuxa 2021 (Spanish)
Survey Plan FN3L 2019 (Spanish)
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)
Manual ESP_IEO_P5_AtSea_Maturity (Spanish)
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
Y
Protocol 3LNO Surveys (Spanish)
Survey Plan Platuxa 2021 (Spanish)
Survey Plan FN3L 2019 (Spanish)
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)
Editing and imputation methods:
Protocol 3LNO Surveys (Spanish)
Survey Plan Platuxa 2021 (Spanish)
Survey Plan FN3L 2019 (Spanish)
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)
Quality document associated to a dataset:
No
Validation of the final dataset:
Final datasets are validated taking into account the guidelines and formats of SC- NAFO.
Protocol 3LNO Surveys (Spanish)
Survey Plan Platuxa 2021 (Spanish)
Survey Plan FN3L 2019 (Spanish)
http://www.ieo.es/es_ES/web/ieo/pndb (section P5: Prospección y evaluación de recursos pesqueros en aguas lejanas)

AR comment: No deviations or developments.

IBTS_Q4 (8c y 9a north)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP
Region: North-East Atlantic
Sampling scheme identifier: IBTS_Q4
Sampling scheme type: Research Survey at Sea
Observation type: SciObsAtSea
Time period of validity: from 2022 until 2027
Short description (max 100 words): Sampling scheme aiming at collecting biological samples (length, age, weight, sex and maturity variables) from bottom-trawl hauls used to provide information useful for the EU CFP to assess the relative abundance of the following demersal and benthic fish species included in Table 2.2 of the WP. (See Text Box 2.6)
Description of the population
Population targeted: The survey area corresponds to the Spanish shelf waters off Galicia and the Cantabrian sea (30-500 m depth), ICES subdivisions 9a North and 8c, and it is conducted in autumn, September-October. The bottom-trawl survey is aimed at the estimation of the abundance and biomass of the populations of the main demersal and benthic fish inhabiting the Galician and Cantabrian shelf. The main assessed target species are those listed as sampled on Table 2.2 Biol variables. **Population sampled:** This bottom-trawl survey is a multispecies one, surveying the 8c9aN demersal and benthic fish species in autumn. The sampled fractions of the target populations will be those ones inhabiting the grounds of the shelf between 30-500 m depth isobaths with few special deep hauls reaching to 800 m deep, not weighted to the area since is not considered representative for the whole deep area. The timing and spatial coverage of this survey has been defined to assess abundance of the fish commercial species and the strength of the annual recruitment of species as hake, megrims or anglers. **Stratification:** The sampling design is area stratified, with 5 geographical sectors (1: Miño river – Fisterra Cape, 2: Fisterra Cape – Estaca, 3: Estaca – Peñas, 4: Peñas – Ajo and 5: Ajo – Bidasoa river) and 3 bathymetric strata (A: 70-120 m, B: 121- 200 m, C: 201-500) with some special hauls shallower than 70 m and deeper than 500 m.
AR comment: No deviations or developments.
Sampling design and protocols

Sampling design description:
Haul allocation is random avoiding sampling contiguous 5 nm squares, but number of hauls per strata is proportional to the area of the strata, area that is used to obtain abundance weighted to the area of the strata.
The sample/subsample of the catch is selected by a Simple Random Sampling (SRS) though size categories are used in species with large catches and skewed size distribution. Individuals of the selected samples are used to obtain various biological variables are collected until the expected number of samples per size range is reached).
Is the sampling design compliant with the 4S principle?:
NA.
Regional coordination:
Y. Sampling design and protocols are developed in the framework of the IBTSWG (ICES working group on Internation bottom trawl surveys).
PRT, FRA, IRL, GBR, DNK, BEL, DEU, NLD, NOR, SWE
Link to sampling design documentation:
The sampling design is described in the Section 7.5.1 of the Survey manual
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf
Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling schemes adopted by the IEO are common within these species group and standardised and coordinated by ICES expert groups.
Link to sampling protocol documentation:
"Manual of the IBTS North Eastern Atlantic Surveys"
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf
Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling protocols adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA.
Monitoring of sampling progress within the sampling year:
NA. Number of hauls is relatively constant though small variability due to weather events may occur.

AR comment: No deviations or developments.

Data capture

Means of data capture:
A complete report of the methodology and equipment used is available in the Manual of the International Bottom Trawl Surveys in the Western and Southern Areas section 7.8
Data capture documentation:
IBTS Western and Southern Areas Manual sections 3 and 7.8
Quality checks documentation:
IBTS Western and Southern Areas Manual section 7.5.4
Data quality controls through filters are implemented in the software tools used, these include: 1. Haul position vs. geographical sector allocation and depths ranges vs. strata allocation; 2. Differences between speed vs. expected tow distance and positions; 3. Catch weight vs. estimated weight of the sampled length distribution using L-W regressions when available.

AR comment: No deviations or developments.

Data storage

National database:
SIRENO ("*Seguimiento Informático de los Recursos Naturales Oceánicos*") is the IEO fisheries and oceanographic Database.
International database:
ICES DATRAS.
Quality checks and data validation documentation:
No documentation targeting quality checks. Analysis and detection of outliers for biological parameters, their weight-length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with ggplot2 package, etc.

AR comment: No deviations or developments.

Sample storage
Storage description: The otoliths of almost all these species are kept in envelopes or vials, these placed in boxes duly labelled and stored on the shelves of the growth warehouses of the IEO oceanographic centres where the samplings have been carried out: Coruña, Vigo and Santander. These pieces are stored systematically, without expiration date. **Sample analysis.** See Annex 1.1 ESP_IEO_P1_Biological_Specific.
AR comment: No deviations or developments.
Data processing
Evaluation of data accuracy (bias and precision): N. **Editing and imputation methods:** Y. Depending on the error it could be tackled correcting the sample data (like some typing errors), while others are excluded from output/calculations or marked as outliers/errors. Age length key (ALK) of the commercial sampling is completed with the age-length survey data and the missing values are completed by an age expert judgement. **Quality document associated to a dataset:** N. **Validation of the final dataset:** The validation of the final information is checked through specific routines developed in R.
AR comment: No deviations or developments.

ANNEX 1.1 - QUALITY REPORT FOR BIOLOGICAL DATA SAMPLING SCHEME

IBTS_Q4 (9a south)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: IBTS_Q4

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
The Southern Spanish Groundfish Survey on the Gulf of Cádiz (SP-GCGFS) is conducted in the southern part of ICES Division 9a, the Gulf of Cádiz. The covered area extends from 15 m to 800 m depth, during autumn (November).

Description of the population

Population targeted:
The survey area corresponds to the Spanish shelf waters of the Gulf of Cadiz (GoC, 20-800 m depth), ICES subdivision 9a South, and it is conducted in **autumn** time. The trawl survey is aimed at the estimation of the abundance and biomass of the populations of the main small demersal fish (SPF) inhabiting the GoC neritic waters). The main assessed target species are: hake *Merluccius merluccius*, shrimp *Parapenaeus longirostris*, Octopus *Octopus vulgaris*, Squid *Loligo vulgaris*, Cuttlefish *Sepia officinalis*

Population sampled:
This bottom-trawl survey is a multispecies one surveying the 9aS demersal and benthic fish species in autumn. The sampled fractions of the target populations will be those ones inhabiting the grounds of the shelf between 20-800 m depth isobaths, not weighted to the area since is not considered representative for the whole deep area. The timing and spatial coverage of this survey has been defined to assess abundance of the fish commercial species and the strength of the annual recruitment of species as hake, megrims or anglers.

Stratification:
Then, the whole area (7224 km2) has been separated into five depth strata (15-30, 31-100, 101-200, 201-500 and 501-800 m). The sampling design is random stratified with proportional allocation with a total of 45 fishing stations and swept-area method.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
Haul allocation is random avoiding sampling contiguous 5 nm squares, but number of hauls per strata is proportional to the area of the strata, area that is used to obtain abundance weighted to the area of the strata.
The sample/subsample of the catch is selected by a Simple Random Sampling (SRS) though size categories are used in species with large catches and skewed size distribution. Individuals of the selected samples are used to obtain various biological variables are collected until the expected number of samples per size range is reached).

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

Regional coordination:
Y. Sampling design and protocols are developed in the framework of the IBTSWG (ICES working group on Internation bottom trawl surveys).
PRT, FRA, IRL, GBR, DNK, BEL, DEU, NLD, NOR, SWE

Link to sampling design documentation:

The sampling design is available in the Manual for the International Bottom Trawl Surveys, Section 7.10.1
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Compliance with international recommendations:

Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling schemes adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

Link to sampling protocol documentation:

Manual for the International Bottom Trawl Surveys
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Compliance with international recommendations:

Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling schemes adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Trawl hauls providing biological samples and the total of muddy and sandy bottoms. The number of trawls (45) in a relatively high sampling coverage of the GoC SPF community.

AR comment: No deviations or developments.

Data capture

Means of data capture:

A complete report of the methodology and equipment used is available in the Manual of the International Bottom Trawl Surveys in the Western and Southern Areas sections 3 and 7.10

Data capture documentation:

IBTS Western and Southern Areas Manual sections 3 and 7.10

Quality checks documentation:

IBTS Western and Southern Areas Manual section 7.10

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("Seguimiento Informático de los Recursos Naturales Oceánicos") is the IEO fisheries and oceanographic Database.

International database:

DATRAS (ICES)

Quality checks and data validation documentation:

No documentation targeting quality checks. Analysis and detection of outliers for biological parameters, their weight-length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with ggplot2 package, etc.

AR comment: No deviations or developments.

Sample storage

Storage description:

The otoliths are kept in vials, these placed in boxes duly labeled and stored on the shelves of the growth warehouses of the IEO oceanographic centres of Cádiz where the samplings are carried out. These pieces are stored systematically, without expiration date.

Sample analysis.

See Annex 1.1 ESP_IEO_P1_Biological_Specific

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N.

Editing and imputation methods:

Y. Depending on the error it could be tackled correcting the sample data (like some typing errors), while others are excluded from output/calculations or marked as outliers/errors.

Age length key (ALK) of the commercial sampling is completed with the age-length survey data and the missing values are

completed by an age expert judgement.

Quality document associated to a dataset:

N.

Validation of the final dataset:

The validation of the final information is checked through specific routines developed in R.

AR comment: No deviations or developments.

IBTS_Q4 (7ck)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP
Region: North-East Atlantic
Sampling scheme identifier: IBTS_Q4
Sampling scheme type: Research Survey at Sea
Observation type: SciObsAtSea
Time period of validity: from 2022 until 2027
Short description (max 100 words): Sampling scheme aiming at collecting biological samples (length, age, weight, sex and maturity variables) from bottom-trawl hauls used to provide information useful for the EU CFP to assess the relative abundance of the following demersal and benthic fish species included in Table 2.2 of the WP.
Description of the population
Population targeted: The survey area corresponds to the Porcupine Bank, western Ireland (170-800 m depth), ICES subdivisions 7ck and 7b >200 m, and it is conducted at the end of summer, mainly in September. The bottom-trawl survey is aimed at the estimation of the abundance and biomass of the populations of the main demersal and benthic fish inhabiting the trawlable grounds on the Porcupine Bank. The main assessed target species are those listed as sampled on Table 2.2 Biol variables, hake, megrims, anglers and *Nephrops*. **Population sampled:** This bottom-trawl survey is a multispecies one surveying the 7ck demersal and benthic fish species. The sampled fractions of the target populations will be those ones inhabiting the grounds of the Porcupine Bank between 170-800 m depth isobaths. The timing and spatial coverage of this survey has been defined to assess abundance of the fish commercial species and the strength of the annual recruitment of species as hake, megrims or anglers. **Stratification:** The sampling design is area stratified, with two geographical sectors (designated as Northern and Southern) and 3 bathymetric strata (E: >300 m, F: 301- 450 m, G: 451-800).
AR comment: No deviations or developments.
Sampling design and protocols

Sampling design description:
Haul allocation is random avoiding sampling contiguous 5 nm squares, but number of hauls per strata is proportional to the area of the strata, area that is used to obtain abundance weighted to the area of the strata.
The sample/subsample of the catch is selected by a Simple Random Sampling (SRS) though size categories are used in species with large catches and skewed size distribution. Individuals of the selected samples are used to obtain various biological variables are collected until the expected number of samples per size range is reached).

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

Regional coordination:
Sampling design and protocols are developed in the framework of the IBTSWG (ICES working group on Internation bottom trawl surveys).
PRT, FRA, IRL, GBR, DNK, BEL, DEU, NLD, NOR, SWE

Link to sampling design documentation:
The sampling design is available in the Manual for the International Bottom Trawl Surveys, Section 7.5.1
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling schemes adopted by the IEO are common within these species group and standardised and coordinated by ICES expert groups.

Link to sampling protocol documentation:
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf
http://doi.org/10.17895/ices.pub.3519

Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling protocols adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA.

Monitoring of sampling progress within the sampling year:
NA. Number of hauls is relatively constant though small variability due to weather events may occur.

AR comment: No deviations or developments.

Data capture

Means of data capture:
A complete report of the methodology and equipment used is available in the Manual of the International Bottom Trawl Surveys in the Western and Southern Areas section 7.5

Data capture documentation:
IBTS Western and Southern Areas Manual sections 3 and 7.5

Quality checks documentation:
IBTS Western and Southern Areas Manual section 7.5.4
Data quality controls through filters are implemented in the software tools used, these include: 1. Haul position vs. geographical sector allocation and depths ranges vs. strata allocation; 2. Differences between speed vs. expected tow distance and positions; 3. Catch weight vs. estimated weight of the sampled length distribution using L-W regressions when available.

AR comment: No deviations or developments.

Data storage

National database:
SIRENO ("*Seguimiento Informático de los Recursos Naturales Oceánicos*") is the IEO fisheries and oceanographic Database.

International database:
ICES DATRAS.

Quality checks and data validation documentation:
No documentation targeting quality checks. Analysis and detection of outliers for biological parameters, their weight-length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with ggplot2 package, etc.

AR comment: No deviations or developments.

Sample storage
Storage description: The otoliths of almost all these species are kept in envelopes or vials, these placed in boxes duly labelled and stored on the shelves of the growth warehouses of the IEO oceanographic centres where the samplings have been carried out: Coruña, Vigo and Santander. These pieces are stored systematically, without expiration date. **Sample analysis**. See Annex 1.1 ESP_IEO_P1_Biological_Specific.
AR comment: No deviations or developments.
Data processing
Evaluation of data accuracy (bias and precision): N. **Editing and imputation methods:** Yes. Depending on the error it could be tackled correcting the sample data (like some typing errors), while others are excluded from output/calculations or marked as outliers/errors. Age length key (ALK) of the commercial sampling is completed with the age-length survey data and the missing values are completed by an age expert judgement. **Quality document associated to a dataset:** No **Validation of the final dataset:** The validation of the final information is checked through specific routines developed in R.
AR comment: No deviations or developments.

IBWSS

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: IBWSS-ESP

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
Sampling scheme aiming at collecting biological samples (length, age, weight, sex and maturity variables) from pelagic hauls used for echo-traces identification for the following pelagic fish species included in Table 2.2 of the WP: *Micromesistius poutassou.* Biological sampling is used to verify the species and length/age composition/structure of echo-traces during echo-integration. Length and weight are also recorded for other species susceptible of being acoustically assessed (*Trachurus trachurus, Scomber scombrus, and Merluccius merluccius)*

Description of the population

Population targeted:
The International Blue Whiting Spawning Stock Survey area corresponds to the spawning grounds west of the British Isles, Rockall Bank, Porcupine Bank and Porcupine Seabight. Five research vessels participated in the survey, coordinated by the "ICES International Pelagic Campaigns Working Group (WGIPS). The Spanish part of this survey takes place in ICES subdivisions 7j-k.in the area called Porcupine Seabight, south of the study area and it is conducted in spring time (mid-March). The acoustic-trawl survey is aimed at the acoustic estimation of the abundance and biomass of the spawning fraction of the Blue Whiting northern stock (*Micromesistius poutassou*), and the hydrographic characterization of the area. In addition, an understanding of the companion species is pursued, especially in the mesopelagic fraction.

Population sampled:
This acoustic-trawl survey is aimed primarily at the spawning fraction of North Stock of Blue Whiting in spring. The sampled fractions of the target populations will be those ones inhabiting the waters between 450-600 m depth isobaths. The timing and spatial coverage of this survey has been defined to achieve containment of this specific stock on its northward migration along the northwestern coast of Europe. Containment is consistently achieved at the survey for the target specie which survey index is used in analytical stock assessment at WGWIDE.
Pelagic hauls providing biological samples are opportunistic and are performed whenever changes are detected in echo-traces, and according to the survey time constraints.

Stratification:
In the total study area of the international Survey, the sampling design is stratified into areas, decided in advance and called strata. This pre-stratification of the study area is required by the software used to obtain the abundance index, 'StoX', which requires that the strata be as permanent as possible to standardize the indices year by year since these indices depend on the area of each stratum. The Spanish part of the survey takes place in one of these areas (Strata 7, Porcupine Seabight)

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The sampling assignment is opportunistic since pelagic sets are made whenever changes in the echo-traces are detected and according to the time constraints of the survey. The sample for the size distribution is selected by a simple random sampling (SRS) of 50 to 100 individuals from the classified catch. The number of fish to be sampled is determined when a clear pattern appears in the distribution. For biological sampling, 40 specimens are selected by simple random sampling.

Is the sampling design compliant with the4S principle?:
NA.

Regional coordination:
Yes. Sampling design and protocols were developed in the framework of the WGIPS
Link to sampling design documentation:
ICES. 2015. Manual for International Pelagic Surveys (IPS). Series of ICES Survey Protocols SISP 9 – IPS. 92 pp. Section 2.3
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=30298
Compliance with international recommendations:
Y. The Blue Whiting stocks are assessed by international group of experts (WGWIDE), and their recommendations are taken into account and implemented. All pelagic surveys in the Northeast Atlantic ICES areas are steered by WGIPS, Working Group of International Pelagic Surveys. The sampling schemes adopted by the IEO are standardised and coordinated by these ICES expert groups.
Link to sampling protocol documentation:
ICES. 2015. Manual for International Pelagic Surveys (IPS). Series of ICES Survey Protocols SISP 9 – IPS. 92 pp.
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=30298
ICES. 2021. Working Group of International Pelagic Surveys (WGIPS). ICES Scientific Reports. 3:40. 481pp
https://doi.org/10.17895/ices.pub.8055
Compliance with international recommendations:
Y. The Blue Whiting stocks are assesed by international group of experts (WGWADE), and their recommendations are taken into account and implemented. All pelagic surveys in the Northeast Atlantic ICES areas are reviewed by WGIPS. The sampling schemes adopted by the IEO are standardised and coordinated by these ICES expert groups.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA.
Monitoring of sampling progress within the sampling year:
NA. Pelagic hauls providing biological samples are opportunistic and are performed whenever changes are detected in echo-traces, and according to the survey time constraints.

AR comment: No deviations or developments.

Data capture

Means of data capture:
Sampling equipment:
All vessels employed a single midwater trawl for biological sampling. Acoustic equipment for data collection is a SIMRAD EK-80 scientific echosounder and post-processing is made with Echoview software. Survey abundance estimates are based on acoustic data collected from calibrated scientific echo sounders using an operating frequency of 38 kHz. All transducers are calibrated using a standardised sphere calibration (Demer et al. 2015) prior, during or directly after the survey. All the acoustic data are subsequently uploaded into Ices Acoustic Database and PGNAPES Database.
Biological sampling:
All components of the trawl haul catch are sorted and weighed; fish and other taxa are identified to species level. Size is measured with Ictiometers, weights using marine scales. All the data of the biological sampling are captured and registered written directly on the sampling sheets designed specifically for it, computerized on board and and subsequently uploaded into ICES Acoustic Database, PGNAPES Database and SIRENO IEO database.
Hydrographic sampling:
Hydrographic sampling (vertical CTD casts) was carried out by each vessel at predetermined locations. The equipment is a CTD SBE25. Depth was capped at a maximum depth of 1000 m in open water. The data is stored in Ices Acoustic Database and PGNAPES Database.
Data capture documentation:
Demer, D. A., Berger, L., Bernasconi, M., Bethke, E., Boswell, K., Chu, D., Domokos, R., et al. 2015. Calibration of acoustic instruments. ICES Cooperative Research Report No. 326.
ICES. 2012. Report of the Workshop on implementing a new TS relationship for blue whiting abundance estimates (WKTSBLUES), 23–26 January 2012, ICES Headquarters, Copenhagen, Denmark. ICES CM 2012/SSGESST:01. 27 pp.
ICES. 2015. Manual for International Pelagic Surveys (IPS). Series of ICES Survey Protocols SISP 9 – IPS. 92 pp.
ICES. 2021. Working Group of International Pelagic Surveys (WGIPS). ICES Scientific Reports. 3:40. https://doi.org/10.17895/ices.pub.8055
Johnsen, E, Totland, A, Skålevik, Å, et al. StoX: An open source software for marine survey analyses. Methods Ecol Evol. 2019; 10: 1523– 1528.
https://doi.org/10.1111/2041-210X.13250
Jolly, G. M., and I. Hampton. 1990. A stratified random transect design for acoustic surveys of fish stocks. Canadian Journal of Fisheries and Aquatic Sciences 47(7): 1282-1291.
Quality checks documentation:

N. No documentation targeting quality checks.
There is a quality control of the data prior to loading it into the databases.
Analysis and detection of outliers for biological parameters, their weight–length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R.

AR comment: No deviations or developments.

Data storage

National database:
SIRENO ("*Seguimiento Informático de los Recursos Naturales Oceánicos*") is the IEO fisheries and oceanographic Database.
International database:
ICES Acoustic Database and PGNAPES Database
Quality checks and data validation documentation:
ICES Acoustic Database: Data submitters can deliver either text files (CSV) or structured mark-up files (XML) for Acoustic and Biological trawl data. In the case of XML a template is released for the users to validate their data before submitting it to the ICES Acoustic Database. This is done by using an XSD 7(XML Schema). An Acoustic XSD schema and Trawl XSD schema are provided separately to facilitate independent submission of the two data types. All general validation rules, quality control, constraint checking and statistical consistency are implemented by using Schematron 8as an ISO standard. In the case of CSV submitted file are converted into XML. Submitted data are as such be validated against the XSD and the Schematron rules and a report of possible errors and warnings is produced. If no errors result, and the data submitter accepts all warnings, then the submitted data is ready to upload into the Acoustic database.
https://www.ices.dk/data/Documents/Specification%20of%20the%20acoustic%20database.pdf

AR comment: No deviations or developments.

Sample storage

Storage description:
The otoliths are kept in envelopes or vials, these placed in boxes duly labeled and stored on the shelves of the growth warehouses of the IEO oceanographic centres where the samplings have been carried out: Vigo and Santander. These pieces are stored systematically, without expiration date.
Sample analysis:
ICES. 2015. Manual for International Pelagic Surveys (IPS). Series of ICES Survey Protocols SISP 9 – IPS. 92 pp. Section 6
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=30298

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
Y. Acoustic data are analysed using the StoX software package (V3.0.5) and R-StoX packages software package (RStoX Framework 3.0.12, RStoX Base 1.3.8 and RStoX Data 1.1.3). A description of StoX software package is provided by Johnsen et. al. (2019). Estimation of abundance from acoustic surveys with StoX is carried out according to the stratified transect design model developed by Jolly and Hampton (1990). Baseline survey strata, established in 2017, were adjusted based on survey effort and observations in 2021. Length and weight data from trawl samples were equally weighted and applied across all transects within a given stratum
Estimate of relative sampling error
For the baseline run, StoX estimates the number of individuals by length group which are further grouped into population characteristics such as numbers at age and sex.
A total length distribution is calculated, by transect, using all the trawl stations assigned to the individual transects. Conversion from NASC (by transect) to mean density by length group by stratum uses the calculated length distribution and a standard target strength equation with user defined parameters. Thereafter, the mean density by stratum is estimated by using a standard weighted mean function, where each transect density is weighted by transect distance. The number of individuals by stratum is given as the product of stratum area and area density.
The bootstrap procedure to estimate the coefficient of variance randomly replaces transects and trawl stations within a stratum on each successive run. The output of all runs are stored in a RData-file, which is used to calculate the relative sampling error.
Johnsen, E, Totland, A, Skålevik, Å, et al. StoX: An open source software for marine survey analyses. Methods Ecol Evol. 2019; 10: 1523– 1528.
https://doi.org/10.1111/2041-210X.13250
Editing and imputation methods:
N
https://www.ices.dk/community/groups/pages/WGIPS.aspx

Quality document associated to a dataset: N **Validation of the final dataset:** April-May, prior of WGWADE meeting
AR comment: No deviations or developments.

MEGS (IEO)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier: MEGS

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity : from 2022 until 2027

Short description (max 100 words):
CAREVA and JUREVA surveys, carried out triennially, provides an index for the strength of the SSB of Atlantic mackerel (*Scomber scombrus*) and a relative abundance index of horse mackerel (*Trachurus trachurus*) spawning stocks in the Northeast Atlantic.

Description of the population

Population targeted:
The target species are mackerel (*Scomber scombrus*) and horse mackerel (*Trachurus trachurus*), and the survey core area comprises ICES subdivisions 9a, 8c and 8b.

Population sampled:
Pelagic species (mainly mackerel and horse mackerel, but also sardine and anchovy, given that both surveys coincide with their spawning time).

Stratification:
As part of the International Mackerel and Horse Mackerel Egg Survey (triennial), two surveys are carried out every three years
MEGS-CAREVA: Area 9a North, 8c, 8b and d South. Period March-April carried out by IEO
MEGS-JUREVA: Area 9a North, 8c, 8b and d South. Period April-May carried out by IEO

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. Section 3. http://doi.org/10.17895/ices.pub.5140

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

Regional coordination:
Sampling design and protocols are developed in the framework of the WGMEGS (ICES working group on mackerel and horse mackerel egg surveys). During the last group in 2021, participants were originally from the following countries: Spain, The Netherlands, Scotland, Ireland, Norway, Germany, Portugal, Faroe Islands, Denmark, and UK.
At each working group meeting as well as during the workshops on egg staging and fecundity estimation, the manual is discussed and updated where necessary, and incorporated in the working group and workshop reports as an annex document. Other methods necessary for adequate storage and preservation of the samples, sorting, identification and staging of fish eggs are described in sections of the different workshops and working group meetings.

Link to sampling design documentation:
SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. Section 3. http://doi.org/10.17895/ices.pub.5140
SISP 5- manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

Compliance with international recommendations:
Y

Link to sampling protocol documentation:

SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140
SISP 5- manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
As mentioned before, sampling design and protocols are developed in the framework of the WGMEGS (ICES working group on mackerel and horse mackerel egg surveys). During the survey year, the researchers responsible for the surveys and sample analysis are in real-time contact with the WGMEGS. In case of problems derived from bad weather, ship/laboratory equipment breakdowns, etc., the participants in the remaining surveys / laboratories try to cover the unsampled area / the analysis of the samples, in such a way as to cause the least possible effect on the index derived from the surveys.

AR comment: No deviations or developments.

Data capture

Means of data capture:
For the collection of biological data in this survey, a marine 'Marell' scale is used for weight and simple ichthyo meters for length. Otoliths are collected in labelled paper envelopes. Samples for fecundity are collected on board following the WG manual (SIPS 5).
The following material is used for the analysis of the samples in the laboratory:

1. For histology: Automatic processor; paraffin dispenser; microtome; termofin bath; cold plate; automatic stainer; oven.
2. For reading histological sections and whole mount samples: Microscopes with camera; the open software 'ImageJ' is used for fecundity and atresia analysis, following the protocol agreed by the group and described in SIPS 5.
3. For studying simple eggs on board: Stereo microscopes; mobile suction and filtration units.
4. For egg analysis in the laboratory: Binocular microscopes.

The results of the egg and fecundity analysis should be submitted to the survey data coordinators, using the updated excel spread sheets, within a month of the end of each cruise. These excel templates for the data entry of the plankton and fecundity data will be distributed by the survey coordinators prior to the surveys commencing.

Data capture documentation:
SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140
SISP 5- Manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

Quality checks documentation:
SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140. Section 9.
SISP 5- manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

AR comment: No deviations or developments.

Data storage

National database:
There is no specific national database for egg and larvae data

International database:
ICES egg and larvae database
https://www.ices.dk/data/data-portals/Pages/Eggs-and-larvae.aspx#:~:text=The%20Eggs%20and%20Larvae%20database,to%20the%20ichthyoplankton%20survey%20data.

Quality checks and data validation documentation:
https://www.ices.dk/data/data-portals/Pages/Eggs-and-larvae.aspx#:~:text=The%20Eggs%20and%20Larvae%20database,to%20the%20ichthyoplankton%20survey%20data.

AR comment: No deviations or developments.

Sample storage

Storage description:
The standard **plankton samples** collected for the SSB estimates will be handled carefully and preserved as soon as practicable. The recommended procedure will be as follows:

a) Remove the end bag used on the station before washing down the net.
b) Attach a clean end bag and gently wash down the net from both ends of the sampler, taking care to wash the lower

surface of the net just in front of the end bucket.

c) Always wash down from the nosecone.
d) Make sure the net is clean, using more than one end bag if necessary.
e) Make doubly sure that a clean end bag is left on the sampler ready for the next station.
f) Wash the plankton from the end bags into a jar with the 4% formaldehyde solution in a wash bottle.
g) Top up the jar with 4% formaldehyde, making sure that the volume of plankton does not exceed 50% of the volume of the jar.
h) Any excess sample should be fixed separately in additional jars.
i) Label jars with station details and put labels containing same details in pencil into all jars.

The standard fixative for use on these surveys will be a 4% solution of buffered (pH 7 - 8) formaldehyde in either distilled or freshwater. (420g of sodium acetate trihydrate is dissolved in 10 litres of 4% formaldehyde, ICES, 2001). The sample should be directly fixed with the addition of the 4% formaldehyde solution and should not come into contact with formaldehyde strength in excess of 4%. The volume of plankton in the sample jar must never exceed 50% of the volume of the jar. Excess sample should be fixed separately in additional jars.

The store is the ICES warehouse at the IEO Vigo oceanographic centre.

The sampling protocol as well as the egg analysis criteria is defined in the SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp.
http://doi.org/10.17895/ices.pub.5140

Mackerel ovary samples are collected (either in CAREVA survey or in PELACUS, survey that is carried out simultaneously) and immediately preserved in formaldehyde solution in containers properly tagged. In the laboratory, a section of the ovary is cut for histology and the remaining ovarian tissue is retained until the end of the collection year. After the analysis, oocyte whole mount subsamples are stored for 5 years in 3.6% formaldehyde. Later, a portion of ovary from a selection of samples is stored as a permanent collection. These samples are stored in 3.6% formaldehyde in closed and labeled plastic jars placed on shelves in labeled cardboard boxes. Histological sections and cassettes of all individuals analyzed are also kept permanently. The store is the ICES warehouse at the IEO Vigo oceanographic centre.

Sample analysis.

The sampling protocol as well as the analysis criteria is defined in the 'SISP 5- manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140

Editing and imputation methods

SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140

Quality document associated to a dataset:

SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140

Validation of the final dataset:

The validation of the final information is checked through specific routines developed in R.

AR comment: No deviations or developments.

MEGS (AZTI)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: North-East Atlantic

Sampling scheme identifier: ESP_AZTI_MEGS

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
AZTI-MEGS survey, carried out triennially, provides biological and hydrographic data to produce an index for the strength of the SSB of Atlantic mackerel (*Scomber scombrus*) and a relative abundance index of horse mackerel (*Trachurus trachurus*) spawning stocks in the Northeast Atlantic.

Description of the population

Population targeted:
The target species are mackerel (*Scomber scombrus*) and horse mackerel (*Trachurus trachurus*), and the central survey area comprises ICES subdivisions 8abcd and 7hj.

Population sampled:
The target populations are the pelagic species mackerel and horse mackerel, but as the spawning of these species coincides in time with other pelagic or semi-demersal populations in the area, data on spawning areas for species such as sardine, anchovy and hake are also obtained.

Stratification:
NA

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140

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

Regional coordination:
Sampling design and protocols are developed in the framework of the WGMEGS (ICES working group on mackerel and horse mackerel egg surveys). During the last group in 2021, participants were originally from the following countries: Spain, The Netherlands, Scotland, Ireland, Norway, Germany, Portugal, Faroe Islands, Denmark, and UK.
At each working group meeting as well as during the workshops on egg staging and fecundity estimation, the manuals (SISP 5 and SISP 6) are discussed and updated where necessary, and incorporated in the working group and workshop reports as an annex document. Other methods necessary for adequate storage and preservation of the samples, sorting, identification and staging of fish eggs are described in sections of the different workshops and working group meetings.

Link to sampling design documentation:
SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140
SISP 5- manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

Compliance with international recommendations:
Y

Link to sampling protocol documentation:
SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp.

http://doi.org/10.17895/ices.pub.5140
SISP 5- manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

Compliance with international recommendations:

Y

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

The sampling design and protocols are developed within the framework of the WGMEGS (ICES Working Group on Mackerel and Horse Mackerel EGg surveyS). During the survey, survey leaders are in real-time contact with the other participants. In case of problems due to bad weather, breakdown of vessel/laboratory equipment, etc. the rest of participants try to take actions such as try to cover the unsampled area or complete unfinished analysis. The common goal is to reduce as much as possible the incertity on the index derived from the surveys.

AR comment: No deviations or developments.

Data capture

Means of data capture:

For the collection of biological data during the survey, the weight of fish is recorded using a POLS (currently: MAREL) marine scale and the length with an ichthyo-meter. Otoliths are collected plates and fixed with eukitt mounting medium. Samples for fecundity are collected on board following the WG manual (SIPS 5).

The following material is used for the analysis of the samples in the laboratory:

1. For histology: HEMA (2-hydroxyethyl methacrylate) resine, microtome, thermostatic plate, hematoxylin-eosin staining, eukitt mounting medium.
2. For reading histological sections and whole mount samples: Microscopes with camera; the open software 'ImageJ' is used for fecundity and atresia analysis, following the protocol agreed by the group and described in SIPS 5.
3. For studying eggs on board: Stereo microscopes, and filtration units.
4. For egg analysis in the laboratory: Binocular microscopes Folsom plankton sub-sampler.

The results of the egg and fecundity analysis should be submitted to the survey data coordinators, using the updated excel spreadsheet, within a month of the end of each cruise. These excel templates for the data entry of the plankton and fecundity data will be distributed by the survey coordinators prior to the surveys commencing.

Data capture documentation:

SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140
SISP 5- Manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

Quality checks documentation:

SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140
SISP 5- Manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

AR comment: No deviations or developments.

Data storage

National database:

NA

International database:

ICES egg and larvae database
https://www.ices.dk/data/data-portals/Pages/Eggs-and-larvae.aspx#:~:text=The%20Eggs%20and%20Larvae%20database,to%20the%20ichthyoplankton%20survey%20data.

Quality checks and data validation documentation:

https://www.ices.dk/data/data-portals/Pages/Eggs-and-larvae.aspx#:~:text=The%20Eggs%20and%20Larvae%20database,to%20the%20ichthyoplankton%20survey%20data

AR comment: No deviations or developments.

Sample storage

Storage description:

The standard plankton samples collected for the SSB estimates will be handled carefully and preserved as soon as practicable. The recommended procedure will be as follows:

a) Remove the end bag used on the station before washing down the net.
b) Attach a clean end bag and gently wash down the net from both ends of the sampler, taking care to wash the

lower surface of the net just in front of the end bucket.

c) Always wash down from the nosecone.
d) Make sure the net is clean, using more than one end bag if necessary.
e) Make doubly sure that a clean end bag is left on the sampler ready for the next station.
f) Wash the plankton from the end bags into a jar with the 4% formaldehyde solution in a wash bottle.
g) Top up the jar with 4% formaldehyde, making sure that the volume of plankton does not exceed 50% of the volume of the jar.
h) Any excess sample should be fixed separately in additional jars.
i) Label jars with station details and put labels containing the same details in pencil into all jars.

The standard fixative for use on these surveys will be a 4% solution of buffered (pH 7 - 8) formaldehyde in either distilled or freshwater. (420g of sodium acetate trihydrate is dissolved in 10 litres of 4% formaldehyde, ICES, 2001). The sample should be directly fixed with the addition of the 4% formaldehyde solution and should not come into contact with formaldehyde strength in excess of 4%. The volume of plankton in the sample jar must never exceed 50% of the volume of the jar. Excess of sample should be fixed separately in additional jars.

All plankton samples preserved in formaldehyde 4% are permanently stored at AZTI Pasaia warehouse in closed and labeled plastic jars placed on shelves in labeled boxes. The sampling protocol as well as the egg analysis criteria is defined in the SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140

Mackerel ovary samples are collected and immediately preserved in formaldehyde solution in appropriately labelled containers. In the laboratory, a section of the ovary is cut for histology and the remaining ovarian tissue is retained for 3 years. These samples are stored in 3.6% formaldehyde in closed and labelled plastic jars placed on shelves in labelled boxes. After the analysis, oocyte whole mount subsamples are stored perpetually in 3.6% formaldehyde. The histological sections and cassettes of all individuals analyzed are also kept permanentlyY at AZTI Pasaia centre's warehouse. The sampling protocol, as well as the analysis criteria, is defined in the 'SISP 5- manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

The sampling protocol as well as the analysis criteria is defined in the 'SISP 5- manual for mackerel and horse mackerel egg surveys (MEGS): AEPM and DEPM fecundity and atresia estimation' (http://bit.ly/2aU83Lc).

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140

Editing and imputation methods:

SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140

Quality document associated to a dataset:

SISP 6- Manual for mackerel and horse mackerel egg surveys, sampling at sea. Series of ICES Survey Protocols. 82 pp. http://doi.org/10.17895/ices.pub.5140

Validation of the final dataset:

AR comment: No deviations or developments.

SAHMAS

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: SAHMAS

Sampling scheme type: SciObsAtSea

Observation type: Research Survey at Sea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
Sampling scheme aiming at recording the speciphic length and weight composition of the pelagic hauls used for echo-traces identification for the following pelagic fish species: *Sardina pilchardus, Engraulis encrasicolus, Trachurus trachurus Scomber scombrus, Micromesistius poutassou, Boops boops, Capros aper, Scomber colias*, and other species susceptible of being acoustically assessed. In addition, biological samplings of the target species are carried out (see WP Table 2.2 and ICES Manual for acoustic surveys (WGACEGG) https://doi.org/10.17895/ices.pub.7462 , section 2.1.2).

Description of the population

Population targeted:
The main target species are: Sardina pilchardus, Engraulis encrasicolus, Trachurus trachurus Scomber scombrus, Micromesistius poutassou, Scomber colias, Boops boops and Capros aper.(See Text Box 2.6). The survey area corresponds to the Northern of the Iberian peninsula shelf waters (ICES Sub-Divisions 9aN and Division 8c).

Population sampled:
This acoustic-trawl survey is a multispecies one surveying the Northern Iberian Peninsula species in Spring. The sampled fractions of the target populations will be those ones inhabiting the shelf waters The timing and spatial coverage of this SAHMAS Spring survey have been defined to achieve containment of the target population at the survey mesoscale, which is achieved for the target species: sardine, blue whiting, boarfish and chub macherel. Not synoptic coverage and/or lack of biological information for some stock components such as anchovy, Atlantic mackerel or horse mackerel, because because they are distributed in waters of the continental slope not sampled by survey. Pelagic hauls providing biological samples are opportunistic and are performed whenever changes are detected in echo-traces, and according to the survey time constraints. (see ICES Manual for acoustic surveys (WGACEGG) https://doi.org/10.17895/ices.pub.7462 , section 2.1.2).

Stratification:
The study area is stratified in 6 geographical strata: Eastern Cantabrian (8cEe), Central Cantabrian (up to the *Peñas* Cape), Western Cantabrian (up to *Estaca de Bares*), Artabre Gulf (8cW), *Rias Baixas* (9aN), and *Rias Baixas* shelf (9aN) waters.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The sampling allocation is opportunistic since the pelagic hauls are performed whenever changes are detected in echo-traces, and according to the survey time constraints. The sample/subsample is selected by a Simple Random Sampling (SRS). Fishes from the target species (see table 2.2) are biologically analyzed (various biological variables are collected on each sampled fish until the expected number of samples is reached). Then, the other individuals are measured until a representative length distribution is obtained for each species. (See ICES Manual for acoustic surveys (WGACEGG) https://doi.org/10.17895/ices.pub.7462 , section 2.1.2).

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

Regional coordination:
Y. Sampling design and protocols were developed in the framework of the WGACEGG.

Link to sampling design documentation:
See ICES Manual for acoustic surveys (WGACEGG) https://doi.org/10.17895/ices.pub.7462 , section 2.1.2).

Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling schemes adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

Link to sampling protocol documentation:
Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES Techniques in Marine Environmental Sciences* Vol. 64. 100 pp.
https://doi.org/10.17895/ices.pub.7462

Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling protocols adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA.

Monitoring of sampling progress within the sampling year:
Pelagic hauls providing biological samples are opportunistic and are performed whenever changes are detected in echo-traces, and according to the survey time constraints. Nevertheless, the final number and location of hauls result in a relatively high sampling coverage of the Northern Iberian Peninsula SPF community.

AR comment: No deviations or developments.

Data capture

Means of data capture:
Length distributions are carried out by means of a measuring board. Weights of both the catches and the individual specimens are taken from marine scales, which register a maximum weight of 60, 12 and 2 kg respectively; accurately: ± 100 ± 10 and ± 2g respectively).
Biological samples are collected and stored onboard. Data from samplings are captured and registered written directly on the sampling sheets designed specifically for it and computerized onboard.

Data capture documentation:
ICES Manual for acoustic surveys (WGACEGG) https://doi.org/10.17895/ices.pub.7462 , section 2.1.3

Quality checks documentation:
Data quality control (QC) checks and validations are performed for all spring surveys. (see ICES Manual for acoustic surveys (WGACEGG) https://doi.org/10.17895/ices.pub.7462 , section 2.1.6)

AR comment: No deviations or developments.

Data storage

National database:
SIRENO ("*Seguimiento Informático de los Recursos Naturales Oceánicos*") is the IEO fisheries and oceanographic Database.

International database: Provide the name of international database(s) and the organisation hosting the database, if applicable. Otherwise, insert 'NA' (not applicable). Provide a link if the database is accessible through a website.
NA.

Quality checks and data validation documentation:
No documentation targeting quality checks.
Analysis and detection of outliers for biological parameters, their weight–length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with (ggplot2 package), etc.

AR comment: No deviations or developments.

Sample storage

Storage description:
The otoliths of almost all these species, are kept in envelopes or vials, these placed in boxes duly labelled and stored on the shelves of the growth warehouses of the IEO oceanographic centres where the samples will be processed: Coruña, Vigo, and Santander. These pieces are stored systematically, without expiration date.
When the histological processing of the gonads is necessary, both the gonadal tissue samples included in paraffin blocks, as the slides with their respective histological sections, are also carefully kept and systematically stored in their respective places, where they remain indefinitely.

Sample analysis:
ICES Manual for acoustic surveys (WGACEGG) https://doi.org/10.17895/ices.pub.7462 , sections 2.1.3 & 2.1.4.

AR comment: No deviations or developments.
Data processing
Evaluation of data accuracy (bias and precision): N. **Editing and imputation methods**: Y. Depending on the error it could be tackled correcting the sample data (like some typing errors), while others are excluded from output/calculations or marked as outliers/errors. Age length key (ALK) of the commercial sampling is completed with the age-length survey data and the missing values are completed by an age expert judgement. In addition, in the case of maturity of any species such as mackerel or horse mackerel for maturity ogives, missing maturity percentages are imputed from historical data. **Quality document associated to a dataset**: N **Validation of the final dataset**: How are datasets validated (quality checked) before providing to end-user? ICES Manual for acoustic surveys (WGACEGG) https://doi.org/10.17895/ices.pub.7462 , sections 2.1.6.
AR comment: No deviations or developments.

SDEPM

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: SDEPM

Sampling scheme type: SciObsAtSea

Observation type: Research survey at sea

Time period of validity: from 2022 until 2027

Short description (max 100 words).
Adaptive sampling scheme aiming at collecting ichthyoplankton samples with PairoVET and CUFES samplers in a pre-defined grid of sampling stations along transects perpendicular to the coast for next pelagic species included in Table 2.2 of the WP: ***Sardina pilchardus*** (target species), *Engraulis encrasicolus, Scomber scombrus, Trachurus trachurus.* Simultaneously to Ichthyoplankton samples, CTDF casts, and fishing hauls are undertaken over the entire spawning region. The survey is coordinated with PELACUS acoustic survey during which the fishing hauls to estimate the adults parameters (sex ratio, female weight, batch fecundity and spawning fraction) needed to apply the DEPM are carried out.

Description of the population

Population targeted:
The main target specie from a survey perspective is *Sardine pilchardus* and the main survey area is ICES divisions 8.c and 9.a North -Cantabrian Sea and Atlantic Iberian waters- for the sardine stock pil 27.8c9a.The Spanish survey (SAREVA) covers the northern area of the stock from the Spanish-Portuguese northern border to the Spanish-French Atlantic waters limit.

Population sampled:
The target population will be sampled in a triennial basis. To obtain spawning stock biomass of sardine, the SDEPM survey is directed at egg abundance and spawning area definition for daily egg production determination and at adult sampling for daily fecundity calculation. Timing for surveying is the peak spawning period of the targeted specie; accordingly, the survey is carried out in March/April in northern Spanish waters. All surveys covered under the auspices of ICES WGACEGG (Working Group on Acoustic and Egg Surveys for small pelagic fish in NE Atlantic) are considered ecosystem surveys and data collection is not limited to the target species alone.

Stratification:
As part of the Iberian DEPM survey for sardine (*Sardina pilchardus*), two surveys are carried out every three years by Portugal (IPMA; PT-DEMP-PIL) and Spain (IEO; SAREVA). The total spawning biomass from the two DEPM surveys is used in the assessment such as fishery independent index for the sardine stock pil.27.8c9a (ICES divisions 8.c and 9.a - Cantabrian Sea and Atlantic Iberian waters).
Three geographical strata are considered for the sardine stock pil.27.8c9a data analyses according to biological/ecological reasons: i) South (9a S), from the Strait of Gibraltar to Cape St. Vicente; ii) West (9a W), from Cape St. Vicente to the border between northern Portugal and Spain (Minho river) and iii) North (9a N & 8c), from the Spanish-Portuguese northern border to the Spanish-French Atlantic waters limit.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The sampling allocation is defined according to the life cycle component of the specie to be sampled:
For the ichthyoplankton component of the population, a grid of transects along which the fixed stations of (PairoVET) sampling are located and an adaptive design has also been applied with the aid of the auxiliary CUFES, the use of which helps in delimiting sardine spawning areas and adapting the sampling intensity and the offshore limit of PairoVET sampling.
For the adult component of the population; fishing hauls are undertaken for the estimation of adult parameters (sex ratio, female weight, batch fecundity, and spawning fraction) within the mature component of the sardine population. Surveying for

adults takes place simultaneously with ichthyoplankton sampling. Fishing hauls should be distributed over the surveyed region according to fish abundance distribution. The number of samples and their spatial distribution is thus organized to ensure good and homogeneous coverage of the survey area and an adequate representation of population demography and distribution. Fishing hauls are conducted by pelagic trawling, following the detection of species schools by echosounder. For logistical reasons, the adult samples for the DEPM that would correspond to SAREVA survey will be taken in the PELACUS survey, which coincides in time and space. In addition, complementary fish market sampling will be carried out.

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

NA

Regional coordination:

The sardine DEPM surveys have been carried out triennially since 1999 in a collaborative work between Portugal (Instituto Portugués do Mar e da Atmosfera, IPMA) and Spain (Instituto Español de Oceanografía, IEO) what led to increased coordination and standardisation of the surveys and analytical methodologies.

Link to sampling design documentation:

SDEPM survey sampling design is described in ICES Cooperative Research Report 332. Section 2.1.2.
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

Compliance with international recommendations:

Y. The sampling design of the SDEPM is in line with international recommendations. Survey is planned and coordinated under the framework of the ICES WGACEGG (Working Group on Acoustic and Egg Surveys for Small Pelagic Fish in NE Atlantic)

Link to sampling protocol documentation:

SDEPM survey sampling protocol is described in ICES Cooperative Research Report 332:
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

Compliance with international recommendations:

Y. The sampling protocol documentation of the SDEPM is in line with international recommendations. Survey sampling protocol is standardized under the framework of the ICES WGACEGG.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

NA.

Monitoring of sampling progress within the sampling year:

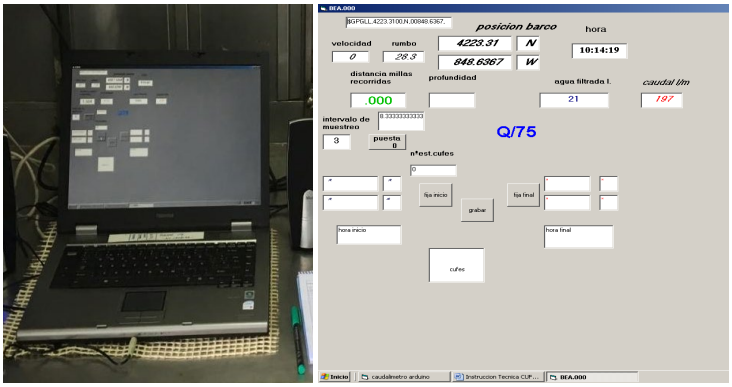
The adaptive design applied to ichthyoplankton sampling, the fact that the surveying for adults takes place simultaneously with ichthyoplankton sampling and the fishing hauls should be distributed over the surveyed region according to fish abundance distribution, should guarantee an adequate sampling for the application of the DEPM.

AR comment: No deviations or developments.

Data capture

Means of data capture:

For the fixed stations of ichthyoplankton (PairoVET), date, time, position (GPS), sampling and bottom depth data, cable released and flowmeter readings are registered on paper and transcribed to spreadsheet as soon as possible. Data for the CUFES sampling is registered electronically with a tailored software/hardware system connected to GPS and data are subsequently uploaded to the spreadsheet database.



Specific software consists of modular, menu-driven routines for acquisition, display, processing, and archiving of oceanographic data acquired with Sea-Bird equipment is used for the profiles of temperature, salinity and fluorescence.
Data for fishing hauls undertaken from PELACUS are captured on paper and transcribed to the IEO SIRENO database as soon as possible.

Data capture documentation:

SDEPM survey data capture is described in ICES Cooperative Research Report 332:
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

Quality checks documentation:

No documentation targeting quality checks. Analysis and detection of errors in data acquisition are carried out graphically using expert judgment, creating common graphs such as maps, scatter plots, histograms, box plots in R with (ggplot2 package), etc. Checks are usually carried out at the end of the sampling and also by analyzing certain relationships between parameters.

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("*Seguimiento Informático de los Recursos Naturales Oceánicos*") is the IEO fisheries and oceanographic Database.

International database:

To achieve the combination at a regional scale of the data from the DEPM and acoustic surveys, the ichthyoplankton and oceanographic data for each survey are block-averaged on a common spatial grid. On this grid it is possible to represent all variables (environmental parameters, egg and fish concentrations, top predators, plankton, etc.) and to structure a common database. A series of gridded data files are created by blocking the raw data from each survey institution, and available parameter.

Gridded data files are stored and available for download from the ICES website via the WGACEGG page or using the following link:

https://community.ices.dk/ExpertGroups/wgacegg/SitePages/HomePage.aspx?RootFolder=%2FExpertGroups%2Fwgacegg%2F2020%20Meeting%20Documents%2F06%2E%20Data&FolderCTID=0x012000F34CB92CB4CD3D4EA424ADBDEF7439AC&View=%7B3F76DBAE%2DB730%2D4E27%2DADE7%2D87D6C20FE3C5%7D

Quality checks and data validation documentation:.

Documentation for gridded data files can be found in ICES Cooperative Research Report 332.
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

AR comment: No deviations or developments.

Sample storage

Storage description:

Ichthyoplankton samples (PairoVET and CUFES) are preserved in buffered formaldehyde at 4% (sodium tetraborate) and stored in appropriately labelled containers. Once at the laboratory, after samples having been sorted, indentified and quantified, samples are preserved in individual containers with folmaldehyde at 4%, labelled and stored on the shelves of the ICES warehouse at the IEO Vigo oceanographic center.Ichthyoplankton samples are kept permanently.

Sardine otoliths, extracted on board PELACUS survey, after having been photographed for aging, are stored in boxes duly labeled and stored on the shelves of the growth warehouses of the IEO Vigo oceanographic center i. These pieces are stored systematically without expiration data.

Sardine gonads (the two lobes of the ovary) collected on PELACUS survey are immediately preserved in formaldehyde solution in individual containers properly tagged. In the laboratory ovary sections are taken for histological processing and 3 subsamples (0.75 mg) extracted for fecundity calculation. The remaining ovary tissue is retained until the end of the year. A piece of ovary from selected samples is stored in 3.6% formaldehyde in closed and labeled plastic jars placed on shelves in labeled cardboard boxes and kept as a permanent collection. Histological sections and cassettes of all individuals studied are also kept permanently. The store place is the ICES warehouse at the IEO Vigo oceanographic centre.

Sample analysis: Provide a brief description or the references to documents, including link to webpages (e.g. age reading manuals, EGs reports and protocols) if adequate, where information on the processing of the samples is provided.

A description for ichthyoplankton and adults sample analysis can be found in ICES Cooperative Research Report 332.
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N. Compare acoustic and DEPM biomass estimates of anchovy and sardine and evaluate their respective bias and precision with a view to providing improved data to stock assessment WGs, is included as a term of reference on the ICES WGACEGG and it is expected to be implemented on the next two years.

Editing and imputation methods:

N.

Quality document associated to a dataset

N

Validation of the final dataset:

Datasets are checked before providing to end-user analysing and detecting errors with a protocol for data exploration using packages and routines from R software (http://www.R-project.org).

AR comment: No deviations or developments.

BIOMAN.

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: BIOMAN

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words).

BIOMAN survey, carried out annually in May since 1987, follows and adaptative sampling scheme to collect ichthyoplankton (PairoVET & CUFES samplers) and adult samples (pelagic trawl) as well as hydrographic data (CTDF) to estimate total biomass index for anchovy and sardine in the Bay of Biscay applying the DEPM. Eggs and adults' parameters are estimated to apply this method. Those results are used in the assessment of these species. Moreover, ecosystem variables are obtained to produce indicators following the Marine Strategy Directive for an ecosystem survey approach such as: zooplankton distribution and abundances (size and spp), eDNA water analysis, sightings, microplastics abundances and distribution.

Description of the population

Population targeted:

The target species are anchovy and sardine. The main survey area are ICES subdivisions 8abcd

Population sampled:

The pelagic species anchovy and sardine are the target species and the stock within the Bay of Biscay (ICES 8abcd) is surveyed. In years when the anchovy or sardine stock is distributed further west than 6º30'W in the Cantabric coast, this fraction of the stock is not surveyed due to time restrictions.

Stratification:

NA

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:

In 1987 a study was done for the egg sampling design (Petitgas et al 1987). Since then, the strategy of egg sampling was identical, i.e. a systematic central sampling scheme with random origin and sampling intensity depending on the egg abundance found (Motos, 1994). Stations were located at intervals of 3 nm along 15 nm apart transects, perpendicular to the coast. In areas of high abundances of eggs, the transects were 7.5 nm apart.

The adult samples are obtained on board R/V Emma Bardán (pelagic trawler) coinciding in space and time with the plankton sampling. When the plankton vessel encountered areas with anchovy or sardine eggs, the R/V Emma Bardán was directed to those areas to fish. In some cases, few samples are obtained from the fleet fishing in the spawning areas to complete the sampling.

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

NA

Regional coordination:

The BIOMAN surveys have been carried out since 1987. In WGACEGG since 19_ coordination and standardization of the DEPM surveys and analytical methodologies within this WG was carried out. The protocol can be found at (see link below)

Link to sampling design documentation:

BIOMAN survey sampling is described in ICES Cooperative Research Report 332.

https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

Compliance with international recommendations:.

Y. The sampling design of BIOMAN survey is in line with international recommendations. Survey is planned and coordinated under the framework of the ICES WGACEGG (Working Group on Acoustic and Egg Surveys for small pelagic fish in NE Atlantic)

Link to sampling protocol documentation:

BIOMAN survey sampling protocol is described in ICES Cooperative Research Report 332:
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

Compliance with international recommendations:

Yes. The sampling protocol documentation of BIOMAN survey is in line with international recommendations. Survey sampling protocol is standardized under the framework of the ICES WGACEGG.

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

An adequate sampling for the application of the DEPM is guaranteed due to the adaptative sampling carried out. For ichthyoplankton to guarantee the sampling of the spawning area, the transects are extended in the oceanic zone until no anchovy or sardine egg is encountered at least during 9 nm. In the Cantabric coast the west limit is considered when a complete transect is found with 0 eggs. To the North the limit is the 8a limit (48ºN). For the adults, the pelagic trawler coincides in space and time with the plankton sampling. When areas with anchovy or sardine eggs are encountered by the vessel sampling ichthyoplankton, the pelagic trawler is directed to those areas to fish. In that manner, the fishing trawls are distributed over the survey area according to fish abundance distribution. When the vessel fishing adults due to different issues can not fish is the ichthyoplankton vessel that fish or samples from the purse seine fleet are used.

AR comment: No deviations or developments

Data capture

Means of data capture:

Ichthyoplankton data:

For PairoVET stations, date, time, position (GPS), sampling and bottom depth data, cable released, and flowmeter readings are registered on a paper and transcribed to a spreadsheet as soon as possible. Sample depth, temperature, salinity, and fluorescence profiles were obtained at each sampling station using a CTD RBR-XR420 coupled to the PairoVET. Those data are downloaded directly to the computer.

The CUFES system had a CTD to record simultaneously temperature and salinity at 3 m depth, a flowmeter to measure the volume of the filtered water, a fluorimeter, and a GPS (Geographical Position System) to provide sampling position and time. All these data are registered at real time using the integrated EDAS (Environmental Data Acquisition System) with custom software.

For adult data:

The fishing hauls data are registered on a paper and transcribed to a spreadsheet as soon as possible.

For sightings:

for first year data are register directly in a tablet

For neuston net (microplastics), eDNA, chlorophyll or other nets, data are registered on a paper and transcribed to a spreadsheet as soon as possible.

For acoustics:

data are recorded directly on the computer and later saved on a hard disk

For zooplankton:

data are recorded automatically in the computer after pass the sample through the flowcam macro system

Data capture documentation:

BIOMAN survey data capture is described in:
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf
and

Santos, M, Uriarte, A., Ibaibarriaga, L., 2011. Spawning Stock Biomass estimates of the Bay of Biscay anchovy (Engraulis encrasicolus, L.) in 2010 applying the Daily Egg Production Method. 18(5): 76-91.

The maturity scale for anchovy and sardine is based on the one adopted at WKSPMAT (ICES Working Group, Report 20078)

The eDNA procedures can be seen at: Canals, O., Mendibil, I., Santos, M., Irigoien, X. and Rodríguez-Ezpeleta, N. 2021. Vertical stratification of environmental DNA in the open ocean captures ecological patterns and behavior of deep-sea fishes. Limnology and Oceanography Letters. doi: 10.1002/lol2.10213

The procedures for sightings can be seen at Louzao, M., García-Barón, I., Rubio, A., Martínez, U., Vázquez, J.A., Murcia, J.L., Nogueira, E., Boyra, G. 2019. Understanding pelagic seabird 3D environment from multidisciplinary oceanographic cruises to advance ecosystem-based monitoring. Marine Ecology Progress Series 617-618: 199-219.

Quality checks documentation:

No documentation targeting quality checks. Analysis and detection of errors in data acquisition are carried out graphically

using expert judgment, creating common graphs such as maps, scatter plots, histograms, box plots in R with (ggplot2 package), etc. Checks are usually carried out at the end of the sampling by analyzing certain relationships between parameters.

AR comment:
For sightings:

-Data are registered on a paper and transcribed to a spreadsheet as soon as possible.

-Checks are usually carried out during and at the end of the sampling by analyzing certain relationships between parameters.

Data storage

National database:
NA
International database:
To achieve the combination at a regional scale of the data from the DEPM and acoustic surveys, the ichthyoplankton and oceanographic data for each survey are block-averaged on a common spatial grid. On this grid it is possible to represent all variables (environmental parameters, egg and fish concentrations, top predators, plankton, etc.) and to structure a common database. A series of gridded data files are created by blocking the raw data from each survey institution, and available parameters.
Gridded data files are stored and available at ICES website:
https://community.ices.dk/ExpertGroups/wgacegg/SitePages/HomePage.aspx?RootFolder=%2FExpertGroups%2Fwgacegg%2F2020%20Meeting%20Documents%2F06%2E%20Data&FolderCTID=0x012000F34CB92CB4CD3D4EA424ADBDEF7439AC&View=%7B3F76DBAE%2DB730%2D4E27%2DADE7%2D87D6C20FE3C5%7D
Quality checks and data validation documentation:
Documentation for gridded data files can be found at ICES Cooperative Research Report 332.
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

AR comment: No deviations or developments.

Sample storage

Storage description:
At sea, plankton samples (PairoVET and CUFES) are preserved in buffered formaldehyde at 4% (sodium tetraborate) and stored in labelled containers. At sea eggs are sorted, identified (anchovy, sardine, *Maurolicus muelleri* and the rest of the eggs) and quantified. Once on land at AZTI Pasaia laboratory, plankton samples and eggs are stored on the shelves at AZTI Pasaia warehouses. Ichthyoplankton samples are kept permanently. Samples from 1987 to 1996 are kept at the University of Cádiz due to lack of space at AZTI.
At sea anchovy and sardine are measure, weight, sex and the otoliths are extracted. These are kept in black plaques by pairs. Once on land at AZTI Pasaia laboratory, otoliths are fixed and read and afterwards stored at the laboratory. They are stored without expiration date
At sea anchovy and sardine ovaries (the two lobes) are preserved in buffered formaldehyde at 4% (sodium tetraborate) in individual labelled containers. Once on land at AZTI Pasaia, in the laboratory ovary sections are taken for histological processing to estimate the Spawning fraction (S) and 3 subsamples (0.05 g) extracted for batch fecundity estimation. The remaining ovary tissues and cassettes of all individuals studied are kept for 3 years. Afterwards are discarded. Histological sections are store permanently at the laboratory at AZTI Pasaia
Sample analysis:
A description for ichthyoplankton and adults sample analysis can be found in ICES Cooperative Research Report 332.
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

AR comment:
Samples from 1987 to 2022 are kept at AZTI Pasaia.

Data processing

Evaluation of data accuracy (bias and precision):
In each working document Santos et al and the year, at the WGACEGG report of each year, the values of the Standard error and coefficient of variation are calculated for each parameter estimate to obtain the total biomasfor anchovy and sardine. i.e
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37986
In annex 3 wd: Ecosystem survey approach: BIOMAN 2020 survey.DEPM anchovy and sardine in the Bay of Biscay.M. Santos Mokoroa, M. Korta, I. Garcia and A. Uriarte
Editing and imputation methods:.
The documentation will be available each year in November at the ices site ie for 2020
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37986

Quality document associated to a dataset: Not yet **Validation of the final dataset:** The datasets are validated at the ICES WGACEGG before sending the data to the assessment WGHANSA
AR comment No deviations or developments

ECOCADIZ_ESP

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: ECOCADIZ_ESP

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):

Sampling scheme aiming at collecting biological samples (length, age, weight, sex and maturity variables) from pelagic hauls used for echo-traces identification for the following pelagic fish species included in Table 2.2 of the WP: *Engraulis encrasicolus, Sardina pilchardus, Scomber scombrus, Scomber colias,Trachurus trachurus and Trachurus mediterraneus.* Age is sampled for anchovy, sardine and chub mackerel only. Biological sampling is used to verify the species and length/age composition/structure of echo-traces during echo-integration. Biological sampling is extended to other species such as *T. picturatus* and *Boops boops*. Length and weight are also recorded for other species susceptible of being acoustically assessed.

Description of the population

Population targeted:

The survey area corresponds to the Portuguese and Spanish shelf waters of the gulf of Cadiz (GoC, 20-200 m depth), ICES subdivision 9a South, and it is conducted in summer time (in the recent years during the first fortnight in August). The acoustic-trawl survey is aimed at the acoustic estimation of the abundance and biomass of the populations of the main small pelagic fish (SPF) inhabiting the GoC neritic waters. The main assessed target species are: anchovy *Engraulis encrasicolus,* sardine *Sardina pilchardus* and chub mackerel *Scomber colias.* The list of assessed target species is extended to: mackerel *Scomber scombrus,* horse mackerel *Trachurus trachurus,* Mediterranean horse mackerel *Trachurus mediterraneus*, blue jack mackerel *Trachurus picturatus* and bogue *Boops boops*. Round sardinella *Sardinella aurita*, blue whiting *Micromesistius poutassou*, boarfish *Capros aper*, long snipefish *Macrorhamphosus scolopax* and pearlside *Maurolicus muelleri* are also acoustically assessed when present.

Population sampled:

This acoustic-trawl survey is a multispecies one surveying the GoC neritic SPF species in summer. The sampled fractions of the target populations will be those ones inhabiting the shelf waters between 20-200 m depth isobaths. The timing and spatial coverage of this summer survey has been defined to achieve stock containment of target species at the mesoscale of the survey (and stocks) (Doray *et al.*, 2021). Containment is consistently achieved at the survey mesoscale for target species whose survey indices are used in analytical stock assessment (anchovy and sardine). ECOCADIZ_ESP does not capture the full summer distribution of blue jack mackerel, blue whiting, boarfish, horse mackerel, mackerel, pearlside, and snipefish when present because either the population or at least a component of the population of these species (e.g. larger fish) are distributed in upper continental slope waters not sampled by the survey.

Pelagic hauls providing biological samples are opportunistic and are performed whenever changes are detected in echo-traces, and according to the survey time constraints. Nevertheless, the final number (20-25 hauls on average) and location of these hauls results in a relatively high sampling coverage of the GoC SPF community (0.06 hauls per surveyed nautical mile; Doray *et al.*, 2021).

Stratification:

The sampling design is not stratified, as SPF species can potentially be distributed over the whole sampling area. Post-stratification regions, where species/size compositions and echo-integrals are assumed to be homogeneous, are further defined for each species to estimate total fish biomass. Acoustic estimates and biological information are usually provided for the Portuguese, Spanish and the whole GoC waters.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The sampling allocation is opportunistic since the pelagic hauls are performed whenever changes are detected in echo-traces, and according to the survey time constraints. The sample/subsample is selected by a Simple Random Sampling (SRS) of 50 individuals from the sorted catch. The selected sample is entirely biologically analyzed (various biological variables are collected on each sampled fish until the expected number of samples is reached).

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

Regional coordination:
Yes. Sampling design and protocols were developed in the framework of the WGACEGG.

Link to sampling design documentation:
Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES Techniques in Marine Environmental Sciences* Vol. 64. 100 pp.
https://doi. org/10.17895/ices.pub.7462.

Compliance with international recommendations:
Yes. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling schemes adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

Link to sampling protocol documentation:
Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES Techniques in Marine Environmental Sciences* Vol. 64. 100 pp.
https://doi.org/10.17895/ices.pub.7462

Compliance with international recommendations:
Yes. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling protocols adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA.

Monitoring of sampling progress within the sampling year:
NA. Pelagic hauls providing biological samples are opportunistic and are performed whenever changes are detected in echo-traces, and according to the survey time constraints. Nevertheless, the final number (20-25 hauls on average) and location of these hauls results in a relatively high sampling coverage of the GoC SPF community.

AR comment: No deviations or developments.

Data capture

Means of data capture:
Biological data from GoC *Engraulis encrasicolus, Sardina pilchardus, Scomber scombrus, Scomber colias, Trachurus trachurus, Trachurus mediterraneus, Trachurus picturatus* and *Boops boops* (from SRS samples of 50 individuals from the catch of pelagic hauls) are captured electronically with a tailored software/hardware system (icrOS) and data are subsequently uploaded to the IEO SIRENO database. The icrOS system simplest hardware setup comprises one or more sampling kiosks and a server connected in a local network. Each of those sampling kiosks is formed by a computer screen, a Raspberry Pi board, a waterproof keyboard and a mouse (**Figure 1**).

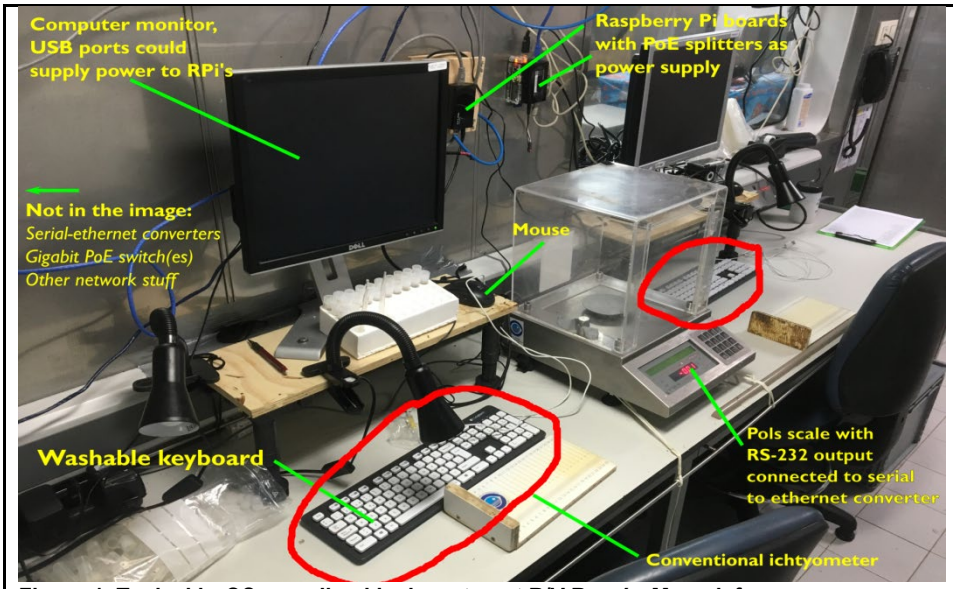


Figure 1. Typical icrOS sampling kiosks setup at R/V Ramón Margalef.

The server runs a PostgreSQL+PostGIS database where data from sampling is stored, a R-Shiny server for data quality checks and reports and a LTSP (Linux Terminal Server Project) which delivers the sampling software and applications to the sampling kiosks at boot time, easing the maintenance of the sampling software across the system.

Additional hardware such scales, GPS, echosounders, icrOS electronic measuring board, etc., can be connected to the system for data capture. In the case of scales, what is particularly recommended to reduce data errors due to bad weighing data recording, the system currently supports data capture from METTLER-TOLEDO, Marel and POLS scales. The icrOS electronic measuring board, however, is designed for sampling of length frequency distributions (LFD) and not for the biological sampling of the individual length measurement, despite it can be used as a conventional measuring board.

Label printers ZEBRA-ZPL2 language compatible can be connected to the system for printing specimen identification labels for labelling vials, etc. with a simple specimen code.

The sampling software consists in several applications for haul events data (position, time, depth...), catch sampling, LFD samplings and biological sampling. Biological sampling is performed using sampling protocols, defined before the sampling (**Figure 2**). For protocol definition, the user chooses the variables to be sampled (numerical for weight or length, categorical for keys, Boolean...) between a set of user defined variables and their sampling order, whether the variable value has a default value or not, if it can be locked (keep the value between specimens, useful when a given value, i.e., the same maturity appears across all the specimens). When the sampling starts, the sampling application reads the selected protocol (**Figure 3**), stored in the system database, and creates the user interface form for that protocol. This makes possible for the application to virtually sample any species (fishes, crustaceans...) if the proper protocol and variables have been defined for it.

The stages of the categorical variables (keys) are set at variable definition time. At sampling time, the user interface provides the user with drop-down lists for the categorical variables with that predefined stages, so the input of values not present in the keys is not possible, providing some extent of quality assurance to the system (**Figure 4**).

The sampling application can also be used for editing the values and samples previously input in case of error correction, and marking any individual variable of the sample as outlier/bad/invalid data is possible (i.e., after checking it is possible to mark as bad data only eviscerated weight for a particular sample, but the rest of the data remains valid).

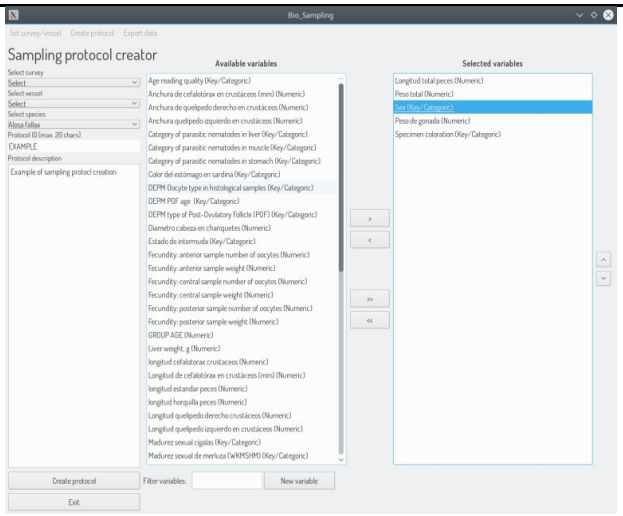


Figure 2. Sampling protocol creator.

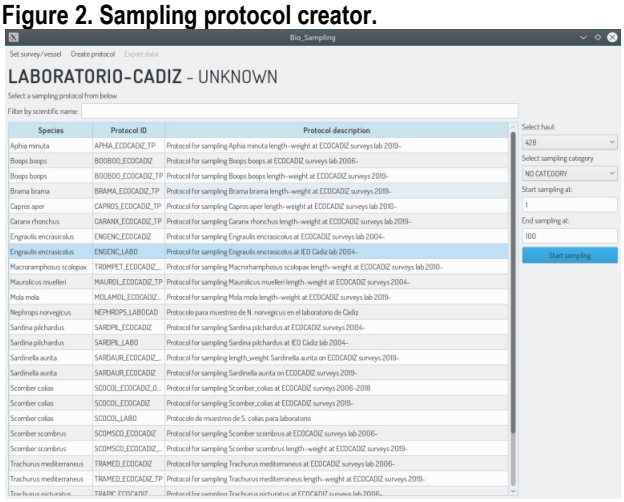


Figure 3. Selection of the sampling protocol.

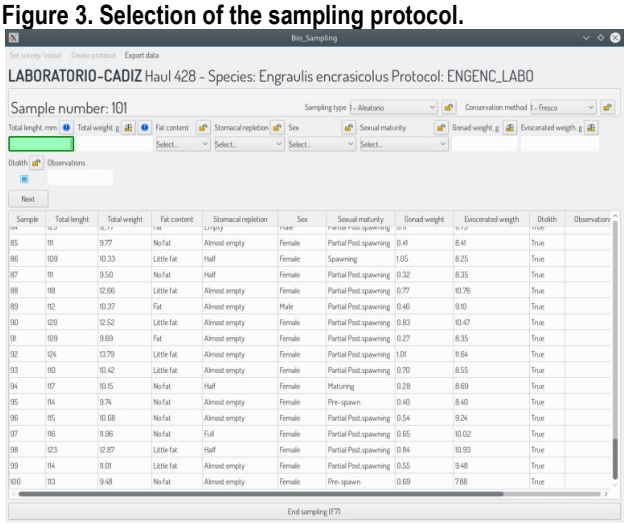


Figure 4. Biological sampling.

The system provides also applications for quality check, which are currently under development and also for data extraction and reporting. These applications are run in a R-Shiny server and can be accessed from any computer connected to the system network.

Data capture documentation:

For the icrOS software/hardware system a first description of the system can be found at ICES WKSEATEC (Workshop on Technical Development to Support Fisheries Data Collection) 2017 Report, pages 16-34 available at https://www.ices.dk/publications/library/Pages/default.aspx#Default={%22k%22:%22wkseatec%22,%22r%22:[{%22n%22:%22owstaxIdPublicationYear%22,%22t%22:[%22\%22%C7%82%C7%824c307c23303837326336 3262652d353934352d343662362d396663642d6565626466643830306666617c32303137\%22%22],%22o%22:

%22and%22,%22k%22:false,%22m%22:null},{%22n%22:%22ReportAcronymOWSCHCS%22,%22t%22:[%22\%22%C7%82%C7%82574b534541544543\%22%22],%22o%22:%22and%22,%22k%22:false,%22m%22:null}]}

However, most recent description of the system can be found in the RCG NANSEA RCG Baltic 2021. Part I Report. 'New data sources and technology'. icrOS. Pgs 38-39. (https://datacollection.jrc.ec.europa.eu/docs/rcg).

Quality checks documentation:

No documentation targeting quality checks.

Analysis and detection of outliers for biological parameters, their weight–length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with (ggplot2 package), etc.

COST.

For small pelagic fish species sampled at ECOCADIZ_ESP, a R-Shiny application is used after sampling is complete for data checking. The application shows graphically the relationships between length, total, eviscerated and gonad weights, so outliers can be detected and corrected if necessary (Figure 5).

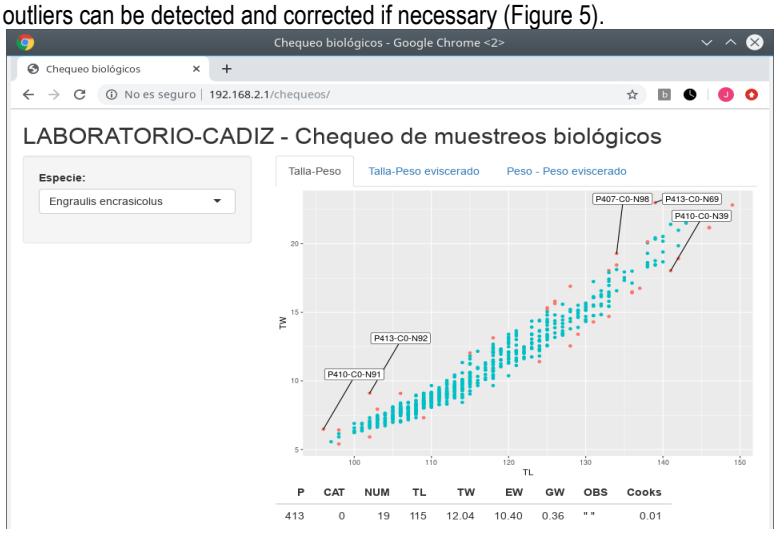


Figure 5. Application for data checking from biological sampling.

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("*Seguimiento Informático de los Recursos Naturales Oceánicos*") is the IEO fisheries and oceanographic Database.

International database:

NA.

Quality checks and data validation documentation:

Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length.

In the case of using icrOS system (GoC SPF species in 9a S), the icrOS system doesn't allow the occurrence of missing values/zeros in those variables defined as mandatory , i.e., total length or total weight.

AR comment: No deviations or developments.

Sample storage

The otoliths of almost all these species are kept in envelopes or vials, these placed in boxes duly labeled and stored on the shelves of the growth warehouses of the IEO oceanographic centres where the samplings have been carried out: Coruña, Vigo, Santander and Cádiz. These pieces are stored systematically, without expiration date.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N.

Editing and imputation methods:

Y. Depending on the error it could be tackled correcting the sample data (like some typing errors), while others are excluded from output/calculations or marked as outliers/errors.

Age length key (ALK) of the commercial sampling is completed with the age-length survey data and the missing values are completed by an age expert judgement. In addition, in the case of maturity of anchovy from the Gulf of Cádiz, for maturity ogives, missing maturity percentages are imputed from historical data.

Quality document associated to a dataset: No **Validation of the final dataset:** ICES Manual for acoustic surveys (WGACEGG) https://doi.org/10.17895/ices.pub.7462, sections 3.1.6
AR comment: No deviations or developments.

JUVENA_ESP

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: JUVENA

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):

The project JUVENA aims at estimating the abundance of the pelagic community, with emphasis on anchovy juvenile population as an early estimator of recruitment, with trawl-acoustic methodology in the Bay of Biscay at the end of the summer every year. The survey is coordinated between AZTI and IEO. AZTI leads the assessment studies and IEO leads the ecological studies. The methodology used to estimate the abundance of juvenile anchovy is the acoustic-trawl methodology. Details of the methodology of the JUVENA surveys were described by Boyra et al (2013).

References: Boyra, G., Martınez, U., Cotano, U., Santos, M., Irigoien, X., and Uriarte, A. 2013. Acoustic surveys for juvenile anchovy in the Bay of Biscay: abundance estimate as an indicator of the next year's recruitment and spatial distribution patterns. ICES Journal of Marine Science, 70: 1354–1368.

Description of the population

Population targeted:

The sampling area coverS the waters of the Bay of Biscay (being 7º15' W and 47º50' N the limits, Figure 1), ICES subdivision 8 a, b, c and d2. Main target species is juvenile anchovy (*Engraules encrasicolus*). Other target species include adult anchovy, and the rest of the pelagic community in the Bay of Biscay: sardine *Sardina pilchardus* and chub mackerel *Scomber colias,* mackerel *Scomber scombrus,* horse mackerel *Trachurus trachurus,* Mediterranean horse mackerel *Trachurus mediterraneus*, and bogue *Boops boops*. blue whiting *Micromesistius poutassou*, boarfish *Capros aper*, and pearlside *Maurolicus muelleri*.

Population sampled:

This acoustic-trawl survey is a multispecies one surveying the Bay of Biscay neritic small pelagic fish species in Autumn. The sampled fractions of the target populations will be those ones inhabiting the shelf and slope waters coinciding with distribution of juvenile anchovy, i.e., tipically between 20-2000 m depth isobaths. The water column is sampled from 10 m to 500 m depth. Pelagic hauls providing biological samples are performed whenever changes are detected in echo-traces, and according to the survey time constraints (Doray *et al*., 2021).

Stratification:

At size- and at-age-abundance and biomass estimates are calculated in post-stratification regions, which are defined as areas with homogeneous species and size composition.

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:

The acoustic sampling is performed during the daytime in two oceanographic vessels. The vessels follow parallel transects, spaced 15 n.mi., perpendicular to the coast along the sampling area, taking into account the expected spatial distribution of anchovy juveniles for these dates, that is, crossing the continental shelf in their way to the coast from offshore waters (Uriarte et al. 2001; Boyra et al., 2016). The transects cover fully the continental shelf and are enlarged in a semi-adaptive sampling design until at least 7.5 nautical miles (half the inter-transect distance) empty of anchovy is achieved.

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

NA.

Regional coordination:
Y. The JUVENA survey sampling design and methodology is coordinated every year under the ICES WGACEGG.

Link to sampling design documentation:
Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES Techniques in Marine Environmental Sciences* Vol. 64. 100 pp.

https://doi. org/10.17895/ices.pub.7462.

Compliance with international recommendations:
Yes. The JUVENA survey sampling design and methodology is coordinated and supervised every year under the ICES WGACEGG Working Group on Acoustic and Egg Surveys for small pelagic fish in Northeast Atlantic.

Link to sampling protocol documentation:
Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES Techniques in Marine Environmental Sciences* Vol. 64. 100 pp.

https://doi.org/10.17895/ices.pub.7462

Compliance with international recommendations:
Yes. The JUVENA survey sampling protocol is coordinated and supervised every year under the ICES WGACEGG Working Group on Acoustic and Egg Surveys for small pelagic fish in Northeast Atlantic.

AR comment:
The vessels follow parallel transects, but the inter-transect distance has been increased from 15 to 18 n.mi. to reduce the risk of biased estimations due to insufficient coverage in case of bad weather conditions.

Sampling implementation

Recording of refusal rate:
NA.

Monitoring of sampling progress within the sampling year:
NA. Pelagic hauls providing biological samples are opportunistic and are performed whenever changes are detected in echo-traces, and according to the survey time constraints.

AR comment: No deviations or developments

Data capture

Means of data capture:
Survey data are collected by research vessels equipped with downward-facing echosounders (Simrad EK60 ir EK80 of 38 kHz frequency) mounted on the ship's hull, on a drop keel, or on a pole mounted on the side of the vessel. In situ on-axis calibration of the echosounders is performed before or after each survey, using standard methodology (Demer et al., 2015).

Midwater trawling (using a Hampidjan Gloria HOD 352 midwater pelagic trawl) is performed to identify acoustic targets and to assess the species and length composition of echotraces. In order to monitor the net opening, fishing depth, and fishing efficiency, all pelagic trawls are equipped with a net sounder (Marport Trawl Eye or Simrad FS70 systems) and door sensors. Trawl vertical opening varies from 10 to 15 m and minimum mesh size is 4 mm. The typical towing speed ranges from 3.5 to 4.5 knots through water. Trawl catches do not allow for the identification of single schools but are generally considered representative of fish schools observed over 2–3 nautical mile portions of the linear transects. Sampling levels for target species comprise weight, otolith, maturity and gender for anchovy (10 individuals per length class per haul), and length for all the species (100 individuals or until clear modes are obtained) using measuring board (0.5 cm resolution for anchovy and pearlside; 1 cm for the rest).

Data capture documentation:
Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES Techniques in Marine Environmental Sciences* Vol. 64. 100 pp.

https://doi.org/10.17895/ices.pub.7462

Quality checks documentation:
Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES*

Techniques in Marine Environmental Sciences Vol. 64. 100 pp.

https://doi.org/10.17895/ices.pub.7462

AR comment No deviations or developments

Data storage

National database:
JUVENA data will be stored in the ICES acoustic database in December 2021.

International database:
https://www.ices.dk/data/data-portals/Pages/acoustic.aspx

Quality checks and data validation documentation:
https://www.ices.dk/data/data-portals/Pages/acoustic.aspx

AR comment: No deviations or developments

Sample storage

Storage description:
The otoliths of almost all these species are kept in envelopes or vials, these placed in boxes duly labeled and stored on the shelves of the growth warehouses of AZTI where the samplings have been carried out: Pasaia and Sukarrieta. These pieces are stored systematically, without expiration date.

Sample analysis:

AR comment No deviations or developments

Data processing

Evaluation of data accuracy (bias and precision):
No.

Editing and imputation methods:
No.

Quality document associated to a dataset:
No

Validation of the final dataset:
Using the quality checks of the ICES acoustic database.

AR comment: No deviations or developments

PALPRO_ESP

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: North-East Atlantic

Sampling scheme identifier:PALPRO_ESP

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
Research Survey at Sea aiming at collecting data on biodiversity and biomass estimates and biological samples of the most deep-water representative species. It also tests the suitability of the commercial longline fishing gear (for dee-water sharks) modified for scientific surveys. The DST sensors installed in the main line allows to set an accurate soak time for each haul and are used to calculate fishing effort and CPUE by haul.

Description of the population

Population targeted:
As the objective is to collect information about the biodiversity of the continental shelf (ICES Division 8c) around the Basque Country, target species include all the fauna present in the area at depths between 650 and 2250 meters, with special attention on sharks and teleost fishes.

Population sampled:
All species caught in the hooks are sampled. Nevertheless, the gear uses a big hook (Mustad Model 7690-9/0) and therefore only big fishes are caught and sampled. As the gear is deployed at depths higher than 650 meters not too much individuals are expected, so every single individual arriving onboard is sampled.

Stratification:
The Bay of Biscay is located in the North-east Atlantic Ocean, in waters belonging to Spain and France. Below 4500m depth, there is an abyssal plain with some submarine mountains that rise up, often aligned in an east–west direction, reaching a height of 2000 m above the abyssal plains. The sampling stations
are located in an area 10.5 km north of Cape Matxitxako in a narrow canyon of about 28 km long that progressively decreases in depth from 500 to 2500 m. The hauls cover the whole depth range along the canyon valley in four 400 m strata: 650–1050 m, 1051–1450 m, 1451–1850m and 1851–2250m.
The stratification is based on 400m intervals following the profile of the canyon valley.

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:
The experimental design is implemented to estimate and assess the inter-annual variation of the abundance and biomass indices of the deep-water ichthyofauna in the area of study. To get homogeneous and comparable data series, the hauls are carried out every year in the same position and period, covering depths from 650 to 2400 m. The stratification is based on 400m intervals following the profile of the canyon valley. A modified former commercial bottom longline fishing gear, specific for deep-water sharks, is adapted for the survey. The gear uses 300 hooks (Mustad Model 7690-9/0), and the soak time is set at 4 h (STECF, 2013). The fishing gear consists of 150 hooks in contact with the bottom, and 150 hooks in a floating section, all of them baited with a third of Atlantic mackerel (*Scomber scombrus*)

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

Regional coordination:
N

Link to sampling design documentation:
A description of the sampling design and the results of previous surveys are available in: Diez G, Arregi L, Basterretxea M,

Cuende E, Oyarzabal I (2021). Preliminary observations on abundance and distribution of fish fauna in a canyon of the Bay of Biscay (ICES Division 8c). Journal of the Marine Biological Association of the United Kingdom 101, 169–178.

Compliance with international recommendations:

Y (ICES WGEF)

Link to sampling protocol documentation:

In 2020 it was presented a Working Document in the ICES WGEF summarizing the first five years of the survey:
Diez, G., Arregi, L., Basterretxea M., Cuende E., Oyarzabal, I. Abundance, biomass and CPUE of deep-water sharks through a five-year deep-water longline survey in the Bay of Biscay (ICES 8c). Working Document presented to the Working Group on Elasmobranch Fishes. ICES WGEF, 16th – 25th, June 2020, WG On line. 9 pp.

Compliance with international recommendations:

Y (ICES WGEF)

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

NA

AR comment: No deviations or developments

Data capture

Means of data capture:

Sampled fishes are measured with a measuring board and biological samples are collected and stored in a freezer onboard. There is a specific software for the data collected by the DST sensors, which is analysed onboard.

Data capture documentation:

Results of previous surveys are available through of the annual report which is available upon request:
G. Díez, L. A. Errazkin ,M. Basterretxea, I Oyarzabal, E. Cuendes,A. Maceira, A. Abaroa,. 2019. Campaña piloto de palangre de profundidad para la estima de abundancia de tiburones y otras especies en la 8c (PALPROF 2020).
They can also be found in Diez et al, 2021

Quality checks documentation:

No

AR comment: No deviations or developments

Data storage

National database:

NA

International database:

The series of data haave been presented and included in the Report of the ICES WGEF 2020 for the ssessing the status of several deep sea shark stocks.
The data series of elasmobranch data (abundance, Nº species, sex, maturity, length, position, date and haul information) have been also submitted in 2020 to data.call@ices.dk for answering the Joint OSPAR and NEAFC Request for data and metadata to be used as the basis to answer the for advice on deep sea sharks, rays and chimaeras. The aim of this request was intended to localize and record data across all countries with records on species from annex 1 from national or international coordinated surveys in order to to provide valuable information before the WKSHARK-6 meeting hold in January 2020.

Quality checks and data validation documentation:

The quality of collected data is checked with expert knowledge and comparing with data from previous years.

Sample storage

Storage description:
Biological samples (soft tissues) are stored in a freezer, inside plastic bags.
Sample analysis:

AR comment: No deviations or developments

Data processing

Evaluation of data accuracy (bias and precision):

No

Editing and imputation methods:

NA

Quality document associated to a dataset:

Yes
Diez et al, 2021

Validation of the final dataset: NA
AR comment: No deviations or developments

MEDIAS

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: Mediterranean and Black Sea

Sampling scheme identifier: MEDIAS

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
The main objective of the research survey at sea MEDIAS (Mediterranean International Acoustic Survey) is to evaluate the abundance, biomass and distribution of small pelagic stocks by means of scientific echosounders (direct method), independently of the data provided by commercial fisheries (indirect method).

Description of the population

Population targeted:
The population targeted are sardine (*Sardina pilchardus*) and anchovy (*Engraulis encrasicolus*) small pelagic stocks in GSAs 1, 5 and 6.
See MEDIAS handbook (April 2021)
http://www.medias-project.eu/medias/website/

Population sampled:
The species object of study and data collection are sardine and anchovy, although the accompanying pelagic community detected with scientific echo sounders is also studied
See MEDIAS handbook(April 2021)
http://www.medias-project.eu/medias/website/

Stratification:
The level of stratification is geographic strata according to GSAs (1, 5 and 6), covering the continental shelf area (from 30 to 250 m depth).

AR comment: AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The MEDIAS survey design covers the Spanish Mediterranean continental shelf (20 to 200 m depth) from the French border to Punta Europa (Strait of Gibraltar). Transects run perpendicular to the coastline/bathymetry. The inter-transect is 4 or 8 nautical miles in order to achieve the minimization of the coefficient of variation of the acoustic estimates for the target species taking into account the topography of each area. Survey is performed during the day.
A calibrated EK80 (Simrad) scientific echosounder is used, equiped with five frequencies (18, 38, 70, 120 and 200 kHz), for the collection of acoustic data. The frequency for assessment is 38 kHz, while the 18, 70, 120 and 200 kHz operate as complementary frequencies. The elementary distance sampling unit (EDSU) is 1 nautical mile. The fish density values are obtained as NASC (Nautical Acoustic Scattering Coefficient) (m2/mn2) values.
Opportunistic pelagic hauls are carried out in order to ground truth the fish echotraces detected by the echosounder. Target species of the MEDIAS surveys are anchovy and sardine, for wich abundance (nº individuals), biomass (tons) are estimated by length, sex and age but biological data for all species in the pelagic community regarding length frequency distribution and length-weight relationships are also acquired. Hidrological variables are collected by CTD's.
See MEDIAS handbook(April 2021)/fish sampling
http://www.medias-project.eu/medias/website/

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

NA

Regional coordination:

Y. MS participating are Spain, France, Greece, Croatia, Italy, Malta and Slovenia.
MEDIAS handbook(April 2021) http://www.medias-project.eu/medias/website/

Link to sampling design documentation:

MEDIAS handbook(April 2021) http://www.medias-project.eu/medias/website/

Compliance with international recommendations:

Y

Link to sampling protocol documentation

MEDIAS handbook(April 2021) http://www.medias-project.eu/medias/website/

Compliance with international recommendations:

Y

AR comment: AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

During the survey, hauls are adaptive, only when echotraces (schools) appear and need to be identified.
MEDIAS handbook(April 2021) http://www.medias-project.eu/medias/website/

AR comment: AR comment: No deviations or developments.

Data capture

Means of data capture:

Biological data (pelagic hauls) are acquired by means of pelagic gears *63.5/51* and *63.5/54*; vertical opening: 16-18 m; with a cod-end mesh size of 20 mm.
The netsonder FS20/25 (Simrad) is used to monitor the correct shape of the net's mouth as well as the entering of schools through the net mouth.
The MARPORT system is used to monitor the arrival and departure of the net from near the seabed, to estimate its horizontal and vertical openings, water temperature and salinity as well as to confirm the arrival of schools to the fishing net codend.
MEDIAS handbook (April 2021) http://www.medias-project.eu/medias/website/
All data of the haul (positions, depth and velocity, as well as species list, length distributions and biological data of species in the catch) are captured on paper. All data are keyed on board into the excel database.
The treatment of catches are detailed in the MEDIAS handbook (April 2021) http://www.medias-project.eu/medias/website/
Weight of all species in the caught, as well as for individuals of the MEDIAS reference list of target species, are registered with marine scales. Length measurements of fish and cephalopods are taken with ichtyometers, while calipers are used for crustaceans.

Data capture documentation:

MEDIAS reports. http://www.medias-project.eu/medias/website/

Quality checks documentation:

Y

First, the information collected on paper is computerized by two people who do a first check of the data, correcting errors on the paper and comparing the information. Then, a cross-validation is carried out by a different pair to detect any failures in the data entry. Finally, the data is refined and filtered by an expert scientist to detect possible outliers.

AR comment: AR comment: No deviations or developments.

Data storage

National database:

There is no specific national database

International database:

There is no specific international database.

Quality checks and data validation documentation:

The data validation is carried out once the initial data (paper) have been computerized and double checked. The data validation process consists of identifying outliers through exploratory statistical analyzes such as box-plot and verifying that the estimated biological parameters (height, weight, sex ratio ...) are within the dynamic confidence intervals established for the historical series of surveys.

AR comment: AR comment: No deviations or developments.

Sample storage

Storage description:

The otoliths are stored in black plastic plates, mounted on non-plastic transparent resin (Eukitt or similar), duly labelled. The pieces are stored systematically in boxes made by hand expressly for each survey, where the plates can be placed

vertically, preventing the dust from deteriorating the samples, without expiration date.
http://www.medias-project.eu/medias/website/
Sample analysis:
Otoliths reading of Engraulis encrasicolus and Sardina pilchardus:
-Villamor, B, Navarro, M.R., Hernández, C, Riveiro, I., Meixide, M., Landa, J., Dueñas, C., Antolinez, A., Barrado, J., Peleteiro, M.E., Otero, R., Loureiro, I., Lopez, E. 2014. Age determination procedures on small and medium pelagic species in Spanish Institute of Oceanography (IEO). Int. Doc. IEO, 40 pp.
-ICES. 2010. Report of the Workshop on Age reading of European anchovy (WKARA), 9-13 November 2009, Sicily, Italy. ICES CM 2009/ACOM:43. 122 pp
-WKARA 2008/2/ACOM43. Criteria for age estimation of anchovy otoliths in the Alborán Sea (Western Mediterranean Sea) based on the monitoring of the hyaline edge formation. [WKARA]
Mazara del Vallo, Italy, 9–14 November 2009
-ICES. 2017. Report of the Workshop on Age estimation of European anchovy (Engraulis encrasicolus). WKARA2 2016 Report 28 November - 2 December 2016. Pasaia, Spain. ICES CM 2016/SSGIEOM:17. 223 pp.
-ICES. 2014. Workshop on micro increment daily growth in European Anchovy and Sardine (WKMIAS), 21-25 October 2013, Mazara del Vallo, Sicily. ICES CM 2013/ACOM:51. 153 pp.
-ICES. 2011. Report of the Workshop on Age Reading of European Atlantic Sardine (WKARAS), 14-18 February 2011, Lisbon, Portugal. ICES CM 2011/ACOM:42. 91 pp.
-ICES. 2019. Workshop on Age Reading of European Sardine (Sardina pilchardus) (NE Atlantic and Mediterranean) (WKARAS2). ICES Scientific Reports. 1:70. 83 pp.
http://doi.org/10.17895/ices.pub.5678

AR comment: AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
A script in R to calculate geostatistical CV associated with biomass estimates from acoustic survey, based on Walline et al. (2007), has been created by Marco Barra (CNR) and tested by all MEDIAS groups. This procedure is considered mandatory to calculate geostatistical CV to be provided along with acoustic estimates.
See MEDIAS handbook(April 2021)/survey design http://www.medias-project.eu/medias/website/

Editing and imputation methods:
NA

Quality document associated to a dataset:
N

Validation of the final dataset:
The validation of the final information is checked through specific routines developed in R.
R Core Team (2013). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL http://www.R-project.org/

AR comment: AR comment: No deviations or developments.

MEDITS

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: Mediterranean and Black Sea

Sampling scheme identifier: MEDITS

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
The main objective of the research survey at sea MEDITS is to evaluate the abundance and distribution of demersal stocks, independently of the data provided by commercial fisheries, and to assess the impact of the fishing activity on the environment.

Description of the population

Population targeted:
The population targeted are demersal fishes, decapods crustaceans and cephalopods in GSAs 1, 2, 5 and 6.
See MEDITS handbook v.9 (2017): http://www.sibm.it/MEDITS%202011/principale%20project.htm

Population sampled:
Since 2012, the MEDITS reference list of target species includes 82 demersal species, 32 of them are elasmobranches.
See Annex VI of MEDITS handbook v.9 (2017): http://www.sibm.it/MEDITS%202011/principale%20project.htm

Stratification:
Two levels of stratification: (1srt) geographic strata according to GSAs and, within some of them, zones limited by lines more or less perpendicular to the coast, depending on the geographical characteristics of each area; (2on) five bathymetric strata within each GSA or zone (10-50 m, 51-100 m, 101-200 m, 201-500 m and 501-800 m).
See Annex II of MEDITS handbook v.9 (2017): http://www.sibm.it/MEDITS%202011/principale%20project.htm

AR comment: AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The hauls are positioned following a depth stratified sampling scheme with random drawing of the positions within each stratum. The number of positions in each stratum is proportional to the area of these strata. Except in the case of peculiar problems (e.g. damages noted in previous years), the hauls are made in the same position from year to year.
See Section 2.3 of MEDITS handbook v.9 (2017): http://www.sibm.it/MEDITS%202011/principale%20project.htm

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

Regional coordination:
Y. MS participating are Albania, Cyprus, Spain, France, Greece, Croatia, Italy, Malta, Montenegro and Slovenia.
See Table 1 and Annex I of MEDITS handbook v.9 (2017): http://www.sibm.it/MEDITS%202011/principale%20project.htm

Link to sampling design documentation:
MEDITS Handbook v.9 (2017): http://www.sibm.it/MEDITS%202011/principale%20project.htm

Compliance with international recommendations:
Y

Link to sampling protocol documentation: Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the sampling design exists, provide details on the sampling protocol in this textbox.
MEDITS Handbook v.9 (2017): http://www.sibm.it/MEDITS%202011/principale%20project.htm

Compliance with international recommendations: Member State shall state 'Y' (yes) if the sampling

protocol is in line with international recommendations, and 'N' if not. If no relevant expert or coordination groups exist, the sampling protocol should be shortly explained in the text, and should be available upon request for the evaluators.
Y

AR comment: AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA
Monitoring of sampling progress within the sampling year:
If needed, the sampling re-allocations are made to adjacent fishing grounds of the bottom trawl fleet in the GSAs 1, 2, 5 and 6, mapped from Satellite-based Vessel Monitoring System (VMS).

AR comment: AR comment: No deviations or developments.

Data capture

Means of data capture:
The gear GOC-73 is a bottom trawl designed for experimental fishing, with a cod-end mesh size of 20 mm. The MARPORT system is used to monitor the arrival and departure of the net from the seabed and to estimate its horizontal and vertical openings. The bottom water temperature and salinity is recorded with the use of a CTD SBE-37, coupled to the flotsam of the net.
See Section 1 and Annex XVI of MEDITS handbook v.9 (2017):
http://www.sibm.it/MEDITS%202011/principale%20project.htm.
All data of the haul (positions, depth and velocity, as well as species list, length distributions and biological data of species in the catch) are captured on paper. All data are keyed on board into the SIRENO database.
The treatment of catches are detailed in the MEDITS Handbook v.9 (2017):
http://www.sibm.it/MEDITS%202011/principale%20project.htm.
Weight of all species in the caught, as well as for individuals of the MEDITS reference list of target species, are registered with marine scales. Length measurements of fish and cephalopods are taken with ichtyometers, while calipers are used for crustaceans.
Data capture documentation:
MEDITS Handbook v.9 (2017): http://www.sibm.it/MEDITS%202011/principale%20project.htm
Quality checks documentation:
Y. Firstly, the information collected on paper is compared with the keyed data on board. Secondly, the ROME software is used for checking the data compiled in the 5 files types used to store and exchange MEDITS data: TA, TB, TC, TE and TL.
See Sections 5.2 and 5.3 of MEDITS handbook v.9 (2017):
http://www.sibm.it/MEDITS%202011/principale%20project.htm
The ROME software to perform multiple check of MEDITS data can be download from:
http://www.coispa.it/index.php?option=com_content&view=article&id=34&Itemid=119&lang=it#block

AR comment: AR comment: No deviations or developments.

Data storage

National database:
SIRENO ("Seguimiento Informático de los Recursos Naturales Oceánicos") is the IEO fisheries and oceanographic Database.
International database:
There is no specific international database.
Quality checks and data validation documentation:.
The ROME software to perform multiple check of MEDITS data can be download from:
http://www.coispa.it/index.php?option=com_content&view=article&id=34&Itemid=119&lang=it#block

AR comment: AR comment: No deviations or developments.

Sample storage

Storage description:
The otoliths and ilicia are stored dry in boxes, duly labelled, at the IEO oceanographic centers where age reading is carried out: Centro Oceanográfico de Málaga, Centro Oceanográfico de Murcia and Centro Oceanográfico de Baleares. These pieces are stored systematically, without expiration date.
See Annex XIV of MEDITS handbook v.9 (2017):
http://www.sibm.it/MEDITS%202011/principale%20project.htm
Stomach contents sampling is made on board and at the Laboratory. In that case, individual stomachs are preserved in ethanol and whole specimens are stored frozen.
Specimens of taxonomic interest are deposited in the Marine Fauna Collection based at the Centro Oceanográfico de

Málaga (IEO): http://www.ma.ieo.es/cfm/

Sample analysis:

Otoliths reading of Mullus barbatus and M. surmuletus:

Mahé, K., Elleboode, R., Charilaou, C., Ligas, A., Carbonara, P. and Intini, S. 2012. Striped red mullet (Mullus surmuletus) and red mullet (M. barbatus) otolith and scale exchange 2011, 30 pp. http://www.coispa.it/docs/Red%20mullet%202012.pdf.

Mahé K., Anastasopoulou A., Bekas P., Carbonara P., Casciaro L., Charilaou C., Elleboode R., Gonzalez N., Guijarro B., Indennidate A., Kousteni V., Massaro A., Mytilineou C., Ordines F., Palmisano M., Panfili M. and Pesci P., 2016. Report of the Striped red mullet (Mullus surmuletus) and Red mullet (Mullus barbatus) Exchange 2016, 21pp. https://archimer.ifremer.fr/doc/00348/45922/45615.pdf.

Carbonara P., W. Zupa, A. Anastasopoulou, A. Bellodi, I. Bitetto, C. Charilaou, A. Chatzispyrou, R. Elleboode, A. Esteban, M.C. Follesa, I. Isajlovic, A. Jadaud, C. García-Ruiz, A. Giannakaki, B. Guijarro, S.E. Kiparissis, A. Ligas, K. Mahé, A. Massaro, D. Medvesek, C. Mytilineou, F. Ordines, P. Pesci, C. Porcu, P. Peristeraki, I. Thasitis, P. Torres, M.T. Spedicato, A. Tursi and L. Sion.- 2019. Explorative analysis on red mullet (Mullus barbatus) ageing data variability in the Mediterranean. Scientia Marina, 83S1: 271-279. https://doi.org/10.3989/scimar.04999.19A.

OTOLITHS READING OF MERLUCCIUS MERLUCCIUS:

Report of the Workshop on Age Validation Studies of Gadoids (WKAVSG), 2013: https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2013/WKAVSG/WKAVSG%202013.pdf

ILICIA READING OF LOPHIUS BUDEGASSA AND L. PISCATORIUS:

Anglerfish Illicia/Otoliths Ageing Workshop, 2011 https://www.ices.dk/community/Documents/PGCCDBS/Anglerfish%20(Lophius%20piscaorius)%20illicia%20and%20otoliths%20exchange%202011_.pdf

AR comment: AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N

Editing and imputation methods:

NA

Quality document associated to a dataset:

N

Validation of the final dataset:

The ROME software is used for checking the data compiled in the 5 files types used to store and exchange MEDITS data: TA, TB, TC, TE and TL.

See Sections 5.2 and 5.3 of MEDITS handbook v.9 (2017): http://www.sibm.it/MEDITS%202011/principale%20project.htm.

The ROME software to perform multiple check of MEDITS data can be download from: http://www.coispa.it/index.php?option=com_content&view=article&id=34&Itemid=119&lang=it#block

AR comment: AR comment: No deviations or developments.

UWTV30

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: UWTV30

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words)

The main objective of UWTV30 survey is the estimation of Norway lobster (*Nephrops norvegicus*) abundance using a sled with an Ultra HD camera and based on the identification and quantification of *Nephrops* burrow density from underwater footage over a known area of the species distribution. Survey design follows a randomized isometric grid of stations at 4 nm spacing. Transects have 10 minutes long that correspond to about 200 m swept.

Description of the population

Population targeted:

The target specie from the UWTV30 survey is the Norway lobster (*Nephrops norvegicus*) and the main survey area is ICES Division 9.a, FU 30 (Gulf of Cadiz) for the stock nep.fu.30. The UWTV30 survey (ISUNEPCA) covers the *Nephrops* distribution on the Spanish waters in the Gulf of Cadiz from 130 to 650 m of depth approximately.

Population sampled:

The target population will be sampled in a yearly basis. The UWTV30 survey is directed at *Nephrops norvergicus*. Timing for surveying is June. It can be considered an ecosystem survey because underwater images are used to collecting ancillary information about other benthic mega-fauna species, litter and trawl marks. In addition, oceanographic data are also collected using a CTD.

Stratification:

No stratification is considered.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:

The UWTV designs followed a randomized isometric grid of stations at 4 nm spacing. The *Nephrops* ground perimeter was established using a combination of VMS and logbook data (2011-2012), *Nephrops* abundance data from bottom trawl surveys series (SP-GCGFS-Q1_IBTS) (1994-2014) and bathymetric and morphologic information (INDEMARES project). Additionally, stations located on the shallower edge of the study area are considered in order to verify the boundary of the *Nephrops* distribution. The sled, once stable on the seabed, is towed at between 0.6-0.7 knots in order to obtain the best possible conditions for counting burrows and 10 good minutes are recorded. This time corresponds to 200 m swept, approximately. HiPAP transponder on the sled is used to obtain the sled position. The distance over ground estimate (DOG) is calculated using the sled position and the field of view of the video footage is 75 cm (FOV), which is confirmed using fun lasers.

Is the sampling design compliant with the 4S principle

NA

Regional coordination: Indicate if the sampling design and protocols were developed as part of a regional or multi-lateral agreement, and if yes, refer to the agreement (table 1.3) and list all MS participating.

N.

Link to sampling design documentation:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for *Nephrops* underwater TV surveys, coordinated under ICES Working Group on *Nephrops* Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp. Section 3.1.1 & Annex 1.

https://doi.org/10.17895/ices.pub.8014.
Leocádio, A., Weetman, A., and Wieland, K. (Eds). 2018. Using UWTV surveys to assess and advise on *Nephrops* stocks. ICES Cooperative Research Report No. 340. 49 pp.
https://doi.org/10.17895/ices.pub.4370

Compliance with international recommendations:

Y. The sampling design of the UWTV30 survey is in line with international recommendations. Survey is planned and coordinated under the framework of the ICES WGNEPS (Working Group on *Nephrops* Surveys).

Link to sampling protocol documentation:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for *Nephrops* underwater TV surveys, coordinated under ICES Working Group on *Nephrops* Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp.
https://doi.org/10.17895/ices.pub.8014
Leocádio, A., Weetman, A., and Wieland, K. (Eds). 2018. Using UWTV surveys to assess and advise on *Nephrops* stocks. ICES Cooperative Research Report No. 340. 49 pp.
https://doi.org/10.17895/ices.pub.4370.

Compliance with international recommendations:

Y. The sampling protocol documentation of the UWTV30 survey is in line with international recommendations. Survey sampling protocol is standardized under the framework of the ICES WGNEPS.

AR comment:

The Nephrops area distribution and coverage of the survey was accepted by the Benchmark Workshop WKNEP in 2016 and this survey was considered as appropriated to providing scientific advice on the abundance of this stock. However, experience acquired during UWTV30 ISUNEPCA survey time series suggests the survey area should be smaller than the current coverage area for this UWTV survey. A new UWTV30 survey area was established in the WGBIE 2023 (ICES, 2023) since nowadays new and more accurate information is available. The Andalusia Regional Government vessel monitoring system instead the traditional VMS, information obtained from the bottom trawl survey index time series (SpSGFS-cspr-WIBTS-Q1 (G7511) and SpGFS-caut-WIBTS-Q4 (G4309)) (1994-2020 period), beam trawl and sediment samples obtained in the ISUNEPCA UWTV survey (U9111) during 2017–2019, as well as, the more detailed seabed morphology information and new information about the relationship between sediments and habitats in the Gulf of Cadiz were used for the definition of the new area survey. The new area coverage is 2332,13 Km2 (approximately 22% less than the current area). A new sampling grid with stations spacing 3.5 nm, instead 4 nm used currently, is also modified to ensure good coverage and accurate burrow surfaces.

Sampling implementation

Recording of refusal rate:

NA.

Monitoring of sampling progress within the sampling year:

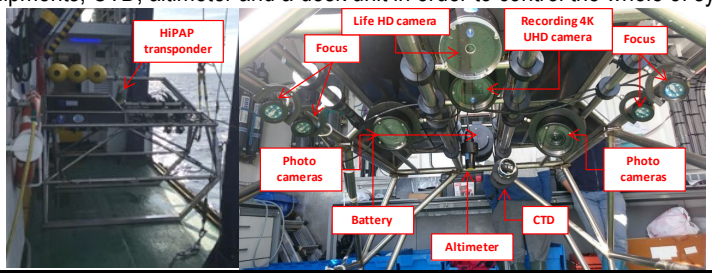
NA.

AR comment: No deviations or developments.

Data capture

Means of data capture:

The sled used to collecting underwater images is a stainless steel structure AISI 316L where all equipments are mounted. This equipment has a HD life camera, 4K UHD recording camera in a angle of 45°, 2 photo cameras (20 Mpixel) which can be use in order to obtain the same scene since two different angles, 4 spotlights with independent intensity control, 3 point lasers forming a triangle of 70 mm side inside of the recording camera cylinder and 2 fun lasers on the structure to confirm the field of view (FOV) whose distance can be graduated between 30 cm and 1 m (FOV used 75 cm), battery to power the equipments, CTD, altimeter and a desk unit in order to control the whole of system (see figure 1).



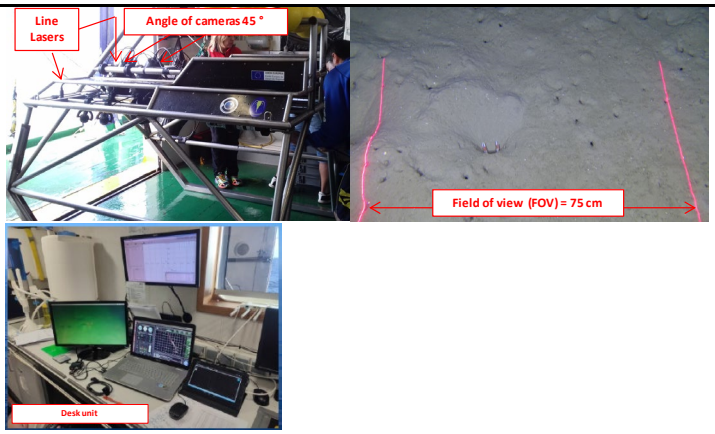


Figure 1. Sled and desk unit used in UWTV30 surveys.

For the each station, date, time, vessel position (GPS), sled position (HiPAP) and depth are recorded during the track (10 minutes) by the software/hardware system in the desk unit. In addition, initial and final data are register also on paper. Footage and data files are downloaded in a hard disc drive after each dive. Oceanographic data is recorded during the track and stored by the CTD. CTD data are downloaded in a hard disc drive after each dive.

Footages are viewed with a laptop and Ultra HD screen using VLC media player software. *Nephrops* burrows counts and ancillary information is recorded on paper and computerizes as soon as possible.

Data capture documentation:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for *Nephrops* underwater TV surveys, coordinated under ICES Working Group on *Nephrops* Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp.
https://doi.org/10.17895/ices.pub.8014

Leocádio, A., Weetman, A., and Wieland, K. (Eds). 2018. Using UWTV surveys to assess and advise on *Nephrops* stocks. ICES Cooperative Research Report No. 340. 49 pp.
https://doi.org/10.17895/ices.pub.4370.

Quality checks documentation: Indicate with 'Y' (yes) or 'N' (no). If 'N' (no), indicate when (year) documentation will be available. Provide a link to a webpage where the documentation can be found. If no link is available, but documentation exists, provide a literature reference (author(s), year and type of publication - e.g. internal report). If no documentation on the quality checks exists, provide some details in the text box.

Y.

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for *Nephrops* underwater TV surveys, coordinated under ICES Working Group on *Nephrops* Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp. Sections 3.1.8, 3.2.7
https://doi.org/10.17895/ices.pub.8014

Leocádio, A., Weetman, A., and Wieland, K. (Eds). 2018. Using UWTV surveys to assess and advise on *Nephrops* stocks. ICES Cooperative Research Report No. 340. 49 pp.
https://doi.org/10.17895/ices.pub.4370.

AR comment: No deviations or developments.

Data storage

National database:

There is no specific national database for *Nephrops* UWTV surveys data.

International database:

There is no specific international database for *Nephrops* UWTV surveys data.

ICES WGNEPS recently includes a ToR about the needed to develop of an international database for *Nephrops* UWTV surveys data which will hold burrow counts, ground shape files and associated data. The first steps just have been given.

Quality checks and data validation documentation:

Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for *Nephrops* underwater TV surveys, coordinated under ICES Working Group on *Nephrops* Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp.
https://doi.org/10.17895/ices.pub.8014

Leocádio, A., Weetman, A., and Wieland, K. (Eds). 2018. Using UWTV surveys to assess and advise on *Nephrops* stocks. ICES Cooperative Research Report No. 340. 49 pp.
https://doi.org/10.17895/ices.pub.4370.

AR comment: No deviations or developments.

Sample storage

Storage description:
Footages, telemetry and CTD data are stored in two hard disc drives during the survey and in a network attached storage (NAS) drive in the lab when the survey is finalized.

Sample analysis:
Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for *Nephrops* underwater TV surveys, coordinated under ICES Working Group on *Nephrops* Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp. Section 5.
https://doi.org/10.17895/ices.pub.8014
Leocádio, A., Weetman, A., and Wieland, K. (Eds). 2018. Using UWTV surveys to assess and advise on *Nephrops* stocks. ICES Cooperative Research Report No. 340. 49 pp.
https://doi.org/10.17895/ices.pub.4370.

AR comment No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
Dobby, H., Doyle, J., Jónasson, J., Jonsson, P., Leocádio, A., Lordan, C., Weetman, A., and Wieland, K. 2021. ICES Survey Protocols – Manual for *Nephrops* underwater TV surveys, coordinated under ICES Working Group on *Nephrops* Surveys (WGNEPS). ICES Techniques in Marine Environmental Sciences Vol. 65. 44 pp.
https://doi.org/10.17895/ices.pub.8014
Leocádio, A., Weetman, A., and Wieland, K. (Eds). 2018. Using UWTV surveys to assess and advise on *Nephrops* stocks. ICES Cooperative Research Report No. 340. 49 pp.
https://doi.org/10.17895/ices.pub.4370.

Editing and imputation methods:
N

Quality document associated to a dataset:
N

Validation of the final dataset:
Using the quality checks of the ICES UWTV surveys

AR comment: No deviations or developments.

IBTS_Q1

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: IBTS_Q1

Sampling scheme type: Research survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
The Southern Spanish Groundfish Survey on the Gulf of Cádiz (SP-GCGFS) is con-ducted in the southern part of ICES Division 9a, the Gulf of Cádiz. The covered area extends from 15 m to 800 m depth, during spring (March).

Description of the population

Population targeted:
The survey area corresponds to the Spanish shelf waters of the Gulf of Cadiz (GoC, 20-800 m depth), ICES subdivision 9a South, and it is conducted in **spring** time. The trawl survey is aimed at the estimation of the abundance and biomass of the populations of the main small demersal fish (SPF) inhabiting the GoC neritic waters). The main assessed target species are: hake *Merluccius merluccius*, shrimp *Parapenaeus longirostris*, Octopus *Octopus vulgaris*, Squid *Loligo vulgaris*, Cuttlefish *Sepia officinalis*

Population sampled:
This bottom-trawl survey is a multispecies one surveying the 9aS demersal and benthic fish species in autumn. The sampled fractions of the target populations will be those ones inhabiting the grounds of the shelf between 20-800 m depth isobaths, not weighted to the area since is not considered representative for the whole deep area. The timing and spatial coverage of this survey has been defined to assess abundance of the fish commercial species and the strength of the annual recruitment of species as hake, megrims or anglers.

Stratification:
Then, the whole area (7224 km2) has been separated into five depth strata (15-30, 31-100, 101-200, 201-500 and 501-800 m). The sampling design is random stratified with proportional allocation with a total of 45 fishing stations and swept-area method.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
Haul allocation is random avoiding sampling contiguous 5 nm squares, but number of hauls per strata is proportional to the area of the strata, area that is used to obtain abundance weighted to the area of the strata.
The sample/subsample of the catch is selected by a Simple Random Sampling (SRS) though size categories are used in species with large catches and skewed size distribution. Individuals of the selected samples are used to obtain various biological variables are collected until the expected number of samples per size range is reached).

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

Regional coordination:
Y. Sampling design and protocols are developed in the framework of the IBTSWG (ICES working group on Internation bottom trawl surveys).
PRT, FRA, IRL, GBR, DNK, BEL, DEU, NLD, NOR, SWE

Link to sampling design documentation:
The sampling design is available in the Manual for the International Bottom Trawl Surveys, Section 7.10.1
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling schemes adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

Link to sampling protocol documentation:
Manual for the International Bottom Trawl Surveys
https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20%E2%80%93%20Revision%2011_Manual%20for%20the%20North%20Sea%20International%20Bottom%20Trawl%20Surveys.pdf

Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling schemes adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA

Monitoring of sampling progress within the sampling year:
Trawl hauls providing biological samples and the total of muddy and sandy bottoms. The number of trawls (45) in a relatively high sampling coverage of the GoC SPF community.

AR comment: No deviations or developments.

Data capture

Means of data capture:
A complete report of the methodology and equipment used is available in the Manual of the International Bottom Trawl Surveys in the Western and Southern Areas sections 3 and 7.10

Data capture documentation:
IBTS Western and Southern Areas Manual sections 3 and 7.10

Quality checks documentation:
IBTS Western and Southern Areas Manual section 7.10

AR comment: No deviations or developments.

Data storage

National database:
SIRENO ("Seguimiento Informático de los Recursos Naturales Oceánicos") is the IEO fisheries and oceanographic Database.

International database:
DATRAS (ICES)

Quality checks and data validation documentation:
No documentation targeting quality checks. Analysis and detection of outliers for biological parameters, their weight-length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with ggplot2 package, etc.

AR comment: No deviations or developments.

Sample storage

Storage description:
The otoliths are kept in vials, these placed in boxes duly labeled and stored on the shelves of the growth warehouses of the IEO oceanographic centres of Cádiz where the samplings are carried out. These pieces are stored systematically, without expiration date.

Sample analysis:
See Annex 1.1 ESP_IEO_P1_Biological_Specific.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):
N.

Editing and imputation methods:
Y. Depending on the error it could be tackled correcting the sample data (like some typing errors), while others are excluded from output/calculations or marked as outliers/errors.
Age length key (ALK) of the commercial sampling is completed with the age-length survey data and the missing values are completed by an age expert judgement.

Quality document associated to a dataset:
N.

Validation of the final dataset: The validation of the final information is checked through specific routines developed in R.
AR comment: No deviations or developments.

BOCADEVA

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: BOCADEVA

Sampling scheme type: Research survey at sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
Adaptive sampling scheme aiming at collecting ichthyoplankton samples with PairoVET and CUFES samplers in a pre-defined grid of sampling stations along transects perpendicular to the coast for next pelagic species included in Table 2.2 of the WP: ***Engraulis encrasicolus*** (target species). *Sardina pilchardus*, *Sardinella aurita* and "Other fishes" eggs are also sorted and counted. Simultaneously to ichthyoplankton samples, CTDF casts, and fishing hauls are undertaken over the entire spawning region. The survey is coordinated with ECOCADIZ_ESP acoustic survey which provides the samples to estimate the adults parameters (sex ratio, female weight, batch fecundity and spawning fraction) needed to apply the DEPM.

Description of the population

Population targeted:
The main target species from a survey perspective is *Engraulis encrasicolus* and the survey area is ICES subdivision 9.a South (Portuguese and Spanish Gulf of Cadiz (GoC) waters). BOCADEVA survey covers the southern component of the anchovy stock in 9a (ane.27.9a).

Population sampled:
The target population will be sampled in a triennial basis. To obtain spawning stock biomass of GoC anchovy, the BOCADEVA survey is directed at egg abundance and spawning area definition for daily egg production determination and at adult sampling for daily fecundity calculation. Timing for surveying is the peak spawning period of the targeted species; accordingly, the survey is carried out in July in GoC waters. All surveys covered under the auspices of ICES WGACEGG (*Working Group on Acoustic and Egg Surveys for small pelagic fish in NE Atlantic*) are considered ecosystem surveys and data collection is not limited to the target species alone.

Stratification:
The sampling design is not stratified, as the target species (adults and eggs) can potentially be distributed over the whole sampling area. Nevertheless, post-strata may be further defined to estimate post-stratified egg and adult parameters and total SSB if a clear spatial pattern is observed in such parameters and if the variance in these estimates can be reduced with this post-stratification.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The sampling allocation is defined according to the species' life-cycle component to be sampled:
For the ichthyoplankton component of the population: a grid of transects, along which the fixed PairoVET stations PairoVET are located. An adaptive design is also applied with the aid of the auxiliary CUFES, the use of which helps in delimiting anchovy spawning areas and adapting the sampling intensity and the offshore limit of PairoVET sampling.
For the adult component of the population: fishing hauls are carried out for the estimation of adult parameters (sex ratio, female weight, batch fecundity, and spawning fraction) within the mature component of the anchovy population. Surveying for adults takes place quasi-simultaneously with ichthyoplankton sampling. Fishing hauls should be distributed over the surveyed region according to fish abundance distribution. The number of samples and their spatial distribution is thus organized to ensure good and homogeneous coverage of the survey area and an adequate representation of population demography and distribution. Fishing hauls are conducted by pelagic trawling, following the detection of species schools by

echosounder.
For logistical reasons, the adult samples for the DEPM that would correspond to BOCADEVA survey will be taken in the ECOCADIZ_ESP survey, which coincides in time and space. In addition, complementary fish market sampling might be carried out if needed.

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

NA

Regional coordination:

BOCADEVA surveys are carried out triennially since 2005 by Spain (Instituto Español de Oceanografía, IEO-CSIC). These surveys are coordinated and their sampling scheme and analytical methodologies standardized within the frame of the ICES WGACEGG.

Link to sampling design documentation:

BOCADEVA survey sampling design is described in *ICES Cooperative Research Report* 332. Section 2.5.1. Available at: https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

Compliance with international recommendations:

Yes. The sampling design of the BOCADEVA surveys is in line with international recommendations. The survey is planned and coordinated under the framework of the ICES WGACEGG.

Link to sampling protocol documentation:

BOCADEVA survey sampling protocol is described in *ICES Cooperative Research Report* 332: Section 2.5
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

Compliance with international recommendations:

Y. The sampling protocol documentation of the BOCADEVA is in line with international recommendations. Survey sampling protocol is standardized under the framework of the ICES WGACEGG.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:

NA.

Monitoring of sampling progress within the sampling year:

The adaptive design applied to ichthyoplankton sampling and the facts that the surveying for adults takes place simultaneously with ichthyoplankton sampling and that the fishing hauls should be distributed over the surveyed region according to fish abundance distribution, should guarantee an adequate sampling for the application of the DEPM.

AR comment: No deviations or developments.

Data capture

Means of data capture:

Ichthyoplankton and CTDF sampling:

For the fixed stations of ichthyoplankton (PairoVET), date, time, position (GPS), sampling and bottom depth data, cable released and flowmeter readings are registered on paper and transcribed to spreadsheet as soon as possible. Data for the CUFES sampling is registered electronically with a tailored software/hardware system connected to GPS (**Figure 1**), and data are subsequently uploaded to the spreadsheet database.

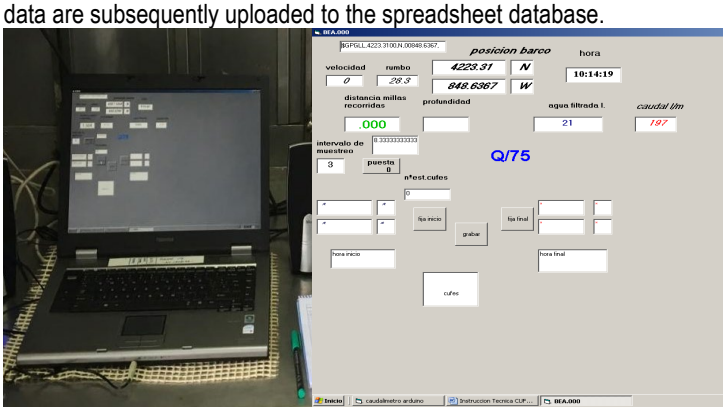


Figure 1. Software/hardware system for CUFES sampling.

Specific software consisting of modular, menu-driven routines for acquisition, display, processing, and archiving of oceanographic data acquired with Sea-Bird equipment is used for the profiles of temperature, salinity and fluorescence.

Adults sampling:

Except for searching anchovy females with hydrated gonads (for the estimation of the batch fecundity, F), fishing stations are mostly conducted during daylight hours and carried out once echotraces supposedly belonging to anchovy are detected by echo-sounder. For the estimation of spawning fraction (S), a minimum of 30 mature, non-hydrated females per sample is sought, so a minimum of 60 random anchovies are sampled, adding batches of 10 random individuals to the sampling until the goal is achieved or a maximum of 120 anchovies are sampled. Sex-ratio (R) and female weight (W) are also obtained

from this random sampling. When hydrated females (HF) appeared, an additional directed sampling is done in order to obtain a minimum of 150 HF for the whole area prospected. Gonads from both hydrated and non-hydrated females are preserved in 4% buffered formaldehyde.

Biological data from GoC *Engraulis encrasicolus* (collected as above), *Sardina pilchardus, Scomber scombrus, Scomber colias, Trachurus trachurus*, *Trachurus mediterraneus, Trachurus picturatus* and *Boops boops* (from SRS samples of 50 individuals from the catch of pelagic hauls) are captured electronically with a tailored software/hardware system (icrOS) and data are subsequently uploaded to the IEO SIRENO database.

The icrOS system simplest hardware setup comprises one or more sampling kiosks and a server connected in a local network. Each of those sampling kiosks is formed by a computer screen, a Raspberry Pi board, a waterproof keyboard and a mouse (**Figure 2**).

The server runs a PostgreSQL+PostGIS database where data from sampling is stored, a R-Shiny server for data quality checks and reports and a LTSP (Linux Terminal Server Project) which delivers the sampling software and applications to the sampling kiosks at boot time, easing the maintenance of the sampling software across the system.

Additional hardware such scales, GPS, echosounders, icrOS electronic measuring board, etc., can be connected to the system for data capture. In the case of scales, what is particularly recommended to reduce data errors due to bad weighing data recording, the system currently supports data capture from METTLER-TOLEDO, Marel and POLS scales. The icrOS electronic measuring board, however, is designed for sampling of length frequency distributions (LFD) and not for the biological sampling of the individual length measurement, despite it can be used as a conventional measuring board.

Label printers ZEBRA-ZPL2 language compatible can be connected to the system for printing specimen identification labels for labeling vials, etc., with a simple specimen code.

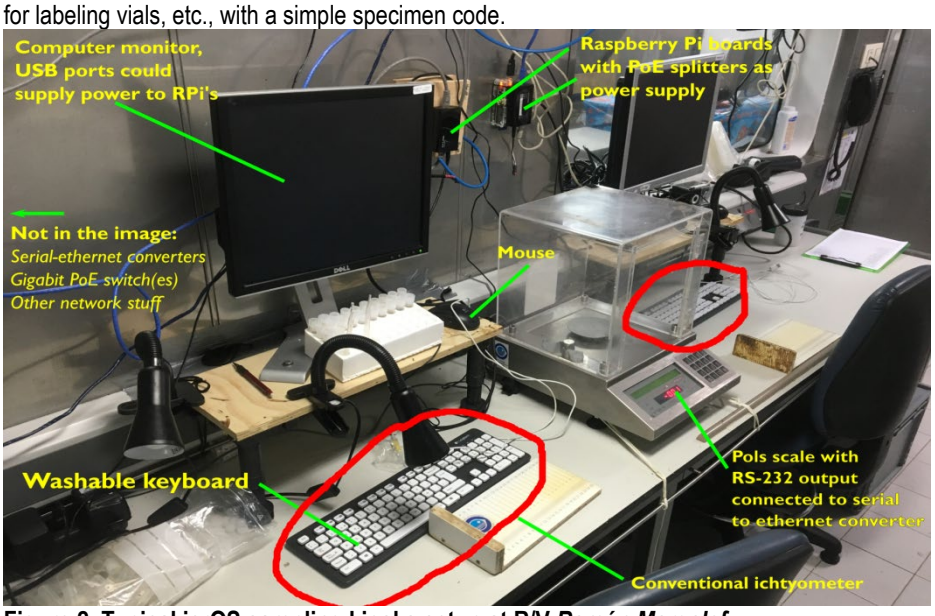


Figure 2. Typical icrOS sampling kiosks setup at R/V *Ramón Margalef*.

The sampling software consists in several applications for haul events data (position, time, depth...), catch sampling, LFD samplings and biological sampling. Biological sampling is performed using sampling protocols, defined before the sampling (**Figure 3**). For protocol definition, the user chooses the variables to be sampled (numerical for weight or length, categorical for keys, Boolean...) between a set of user defined variables and their sampling order, whether the variable value has a default value or not, if it can be locked (keep the value between specimens, useful when a given value, i.e., the same maturity appears across all the specimens). When the sampling starts, the sampling application reads the selected protocol (**Figure 4**), stored in the system database, and creates the user interface form for that protocol. This makes possible for the application to virtually sample any species (fishes, crustaceans...) if the proper protocol and variables have been defined for it.

The stages of the categorical variables (keys) are set at variable definition time. At sampling time, the user interface provides the user with drop-down lists for the categorical variables with that predefined stages, so the input of values not present in the keys is not possible, providing some extent of quality assurance to the system (**Figure 5**).

The sampling application can also be used for editing the values and samples previously input in case of error correction, and marking any individual variable of the sample as outlier/bad/invalid data is possible (i.e., after checking it is possible to mark as bad data only eviscerated weight for a particular sample, but the rest of the data remains valid).

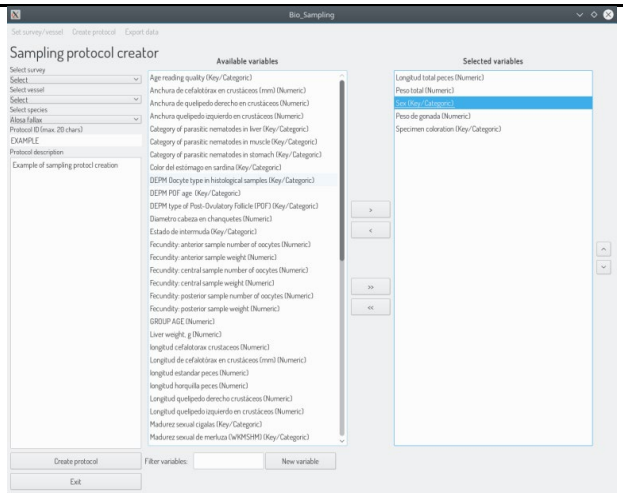


Figure 3. Sampling protocol creator.

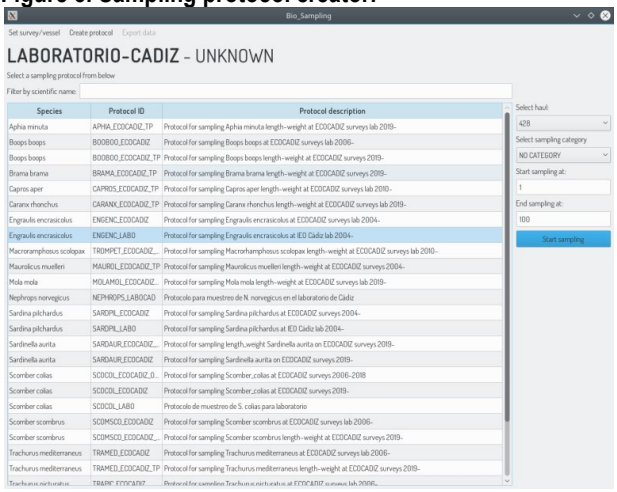


Figure 4. Selection of the sampling protocol.

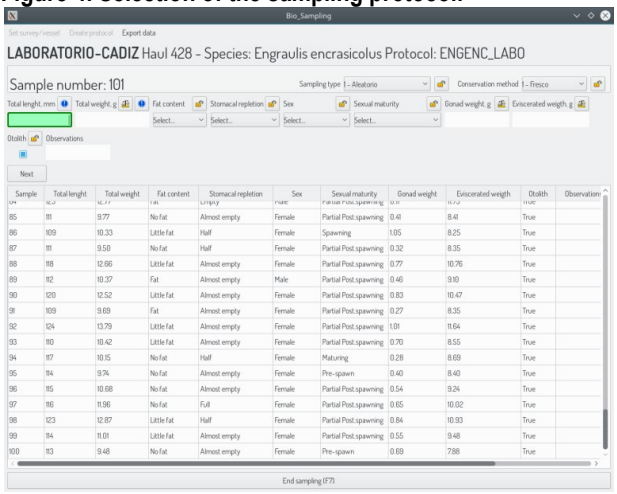


Figure 5. Biological sampling.

The system provides also applications for quality check, which are currently under development and also for data extraction and reporting. These applications are run in an R-Shiny server and can be accessed from any computer connected to the system network.

Data capture documentation:

BOCADEVA survey data capture is described in *ICES Cooperative Research Report* 332: https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

ECOCADIZ survey protocols and methods are described in Doray *et al.* (2021): Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES Techniques in Marine Environmental Sciences* Vol. 64. 100 pp. Available at: https://doi. org/10.17895/ices.pub.7462.

For the icrOS software/hardware system a first description of the system can be found at ICES WKSEATEC (*Workshop on Technical Development to Support Fisheries Data Collection*) 2017 Report, pages 16-34. Available at: (https://www.ices.dk/publications/library/Pages/default.aspx#Default={%22k%22:%22wkseatec%22,%22r%22:[{%22n%22:%22owstaxIdPublicationYear%22,%22t%22:[%22\%22%C7%82%C7%824c307c233038373263363262652d353934352d343662362d396663642d6565626466643830306666617c32303137\%22%22],%22o%22:%22and%22,%22k%22:false,%22m%22:null},{%22n%22:%22ReportAcronymOWSCHCS%22,%22t%22:[%22\%22%C7%82%C7%82574b534541544543\%22%22],%22o%22:%22and%22,%22k%22:false,%22m%22:null}]}

However, most recent description of the system can be found in the RCG NANSEA RCG Baltic 2021. Part I Report. 'New data sources and technology'. icrOS. Pgs 38-39. (https://datacollection.jrc.ec.europa.eu/docs/rcg).

Quality checks documentation:

No documentation targeting quality checks. Analysis and detection of errors in data acquisition are carried out graphically using expert judgment, creating common graphs such as maps, scatter plots, histograms, box-plots in R with (ggplot2 package), etc. Checks are usually carried out at the end of the sampling and also by analyzing certain relationships between parameters.

For small pelagic fish species sampled at ECOCADIZ_ESP, an R-Shiny application is used after sampling is complete for data checking. The application shows graphically the relationships between length, total, eviscerated and gonad weights, so outliers can be detected and corrected if necessary (**Figure 6**).

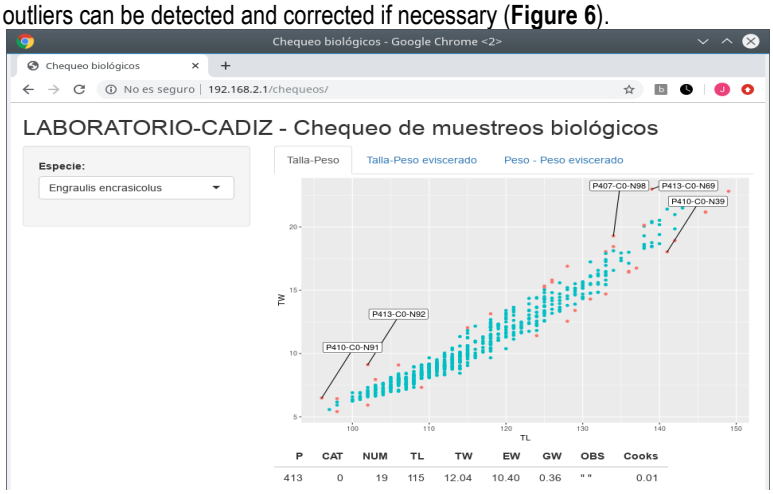


Figure 6. Application for data checking from biological sampling.

AR comment: No deviations or developments.

Data storage

National database:

SIRENO, the IEO database, is currently taking over the functions of the Spanish database, which has not yet finished development.

International database:

To achieve the combination at a regional scale of the data from the DEPM and acoustic surveys, the ichthyoplankton and oceanographic data for each survey are block-averaged on a common spatial grid. On this grid it is possible to represent all variables (environmental parameters, egg and fish concentrations, top predators, plankton, etc.) and to structure a common database. A series of gridded data files are created by blocking the raw data from each survey institution, and available parameter.

Gridded data files are stored and available for download from the ICES website via the WGACEGG page or using the following link:

https://community.ices.dk/ExpertGroups/wgacegg/SitePages/HomePage.aspx?RootFolder=%2FExpertGroups%2Fwgacegg%2F2020%20Meeting%20Documents%2F06%2E%20Data&FolderCTID=0x012000F34CB92CB4CD3D4EA424ADBDEF7439AC&View=%7B3F76DBAE%2DB730%2D4E27%2DADE7%2D87D6C20FE3C5%7D

Quality checks and data validation documentation: Provide link to webpage where the documentation can be found. Otherwise, provide some details in the text box.

Documentation for gridded data files can be found in ICES Cooperative Research Report 332. Available at: https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf.

Our data recording system (SIRENO) doesn´t allow the introduction of missing values/zeros for total length.

In the case of using icrOS system (GoC SPF species in 9a S), the icrOS system doesn't allow the occurrence of missing values/zeros in those variables defined as mandatory , i.e., total length or total weight.

AR comment: No deviations or developments.

Sample storage

Storage description:

Ichthyoplankton samples (PairoVET and CUFES) are preserved in buffered formaldehyde at 4% (sodium tetraborate) and stored in appropriately labeled containers. Once at the laboratory, after samples having been sorted, indentified and quantified, samples are preserved in individual containers with folmaldehyde at 4%, labelled and stored on the shelves of the ICES warehouse at the IEO Cadiz oceanographic center. Ichthyoplankton samples are kept permanently.

The GoC anchovy otoliths extracted on board ECOCADIZ_ESP survey are kept in envelopes or vials, these are placed in boxes duly labeled and stored on the shelves of the growth warehouses of the IEO Cadiz oceanographic centre. These pieces are stored systematically, without expiration date.

Anchovy gonads (the two lobes of the ovary) collected on ECOCADIZ_ESP survey are immediately preserved in formaldehyde solution in individual containers properly tagged. In the laboratory ovary sections are taken for histological processing and 3 subsamples extracted for fecundity calculation. The remaining ovary tissue is retained until the end of the year. A piece of ovary from selected samples is stored in 3.6% formaldehyde in closed and labeled plastic jars placed on shelves in labeled cardboard boxes and kept as a permanent collection. Histological sections and cassettes of all individuals studied are also kept permanently. The store place is the ICES warehouse at the IEO Cadiz oceanographic centre.

Sample analysis:

A description for ichthyoplankton and adults samples analysis can be found in ICES Cooperative Research Report 332.
https://www.ices.dk/sites/pub/Publication%20Reports/Cooperative%20Research%20Report%20(CRR)/CRR%20332.pdf

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N. To compare acoustic and DEPM biomass estimates of anchovy and sardine and evaluate their respective bias and precision with a view to providing improved data to stock assessment WGs, is included as a term of reference on the ICES WGACEGG and it is expected to be implemented on the next two years.

Editing and imputation methods:

N

Quality document associated to a dataset:

N

Validation of the final dataset:

Datasets are checked before providing to end-user analysing and detecting errors with a protocol for data exploration using packages and routines from R software (http://www.R-project.org).

AR comment: No deviations or developments.

ECOCADIZ_RECLUTAS

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS: ESP

Region: North-East Atlantic

Sampling scheme identifier: ECOCADIZ-RECLUTAS

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):

Sampling scheme aiming at collecting biological samples (length, age, weight, sex and maturity variables) from pelagic hauls used for echo-traces identification for the following pelagic fish species included in Table 2.2 of the WP: *Engraulis encrasicolus, Sardina pilchardus, Scomber scombrus, Scomber colias,Trachurus trachurus and Trachurus mediterraneus.* Age is sampled for anchovy, sardine and chub mackerel only. Biological sampling is used to verify the species and length/age composition/structure of echo-traces during echo-integration. Biological sampling is extended to other species such as *T. picturatus* and *Boops boops*. Length and weight are also recorded for other species susceptible of being acoustically assessed.

Description of the population

Population targeted.

The survey area corresponds to the Portuguese and Spanish shelf waters of the gulf of Cadiz (GoC, 20-200 m depth), ICES subdivision 9a South, and it is conducted in autumn time (in the recent years during the first 20 days in October). The acoustic-trawl survey is aimed at the acoustic estimation of the abundance and biomass of the populations of the main small pelagic fish (SPF) inhabiting the GoC neritic waters, with special emphasis in the anchovy and sardine recruitment (age 0 juvenile fish). The main assessed target species are: anchovy *Engraulis encrasicolus,* sardine *Sardina pilchardus* and chub mackerel *Scomber colias.* The list of assessed target species is extended to: mackerel *Scomber scombrus,* horse mackerel *Trachurus trachurus,* Mediterranean horse mackerel *Trachurus mediterraneus*, blue jack mackerel *Trachurus picturatus* and bogue *Boops boops*. Round sardinella *Sardinella aurita*, blue whiting *Micromesistius poutassou*, boarfish *Capros aper*, long snipefish *Macrorhamphosus scolopax* and pearlside *Maurolicus muelleri* are also acoustically assessed when present.

Population sampled:

This acoustic-trawl survey is a multispecies (recruitment) one surveying the GoC neritic SPF species in autumn. The sampled fractions of the target populations will be those ones inhabiting the shelf waters between 20-200 m depth isobaths. The timing and spatial coverage of this autumn survey has been defined to achieve stock containment of target species at the mesoscale of the survey (and stocks) (Doray *et al*., 2021). Containment is consistently achieved at the survey mesoscale for target species whose survey indices are used in analytical stock assessment (anchovy and sardine). ECOCADIZ_RECLUTAS does not capture the full summer distribution of blue jack mackerel, blue whiting, boarfish, horse mackerel, mackerel, pearlside, and snipefish when present because either the population or at least a component of the population of these species (e.g. larger fish) are distributed in upper continental slope waters not sampled by the survey.

Pelagic hauls providing biological samples are opportunistic and are performed whenever changes are detected in echo-traces, and according to the survey time constraints. Nevertheless, the final number (20-25 hauls on average) and location of these hauls results in a relatively high sampling coverage of the GoC SPF community (0.06 hauls per surveyed nautical mile; Doray *et al*., 2021).

Stratification:

The sampling design is not stratified, as SPF species can potentially be distributed over the whole sampling area. Post-stratification regions, where species/size compositions and echo-integrals are assumed to be homogeneous, are further defined for each species to estimate total fish biomass. Acoustic estimates and biological information are usually provided for the Portuguese, Spanish and the whole GoC waters.

AR comment: No deviations or developments.

Sampling design and protocols

Sampling design description:
The sampling allocation is opportunistic since the pelagic hauls are performed whenever changes are detected in echo-traces, and according to the survey time constraints. The sample/subsample is selected by a Simple Random Sampling (SRS) of 50 individuals from the sorted catch. The selected sample is entirely biologically analyzed (various biological variables are collected on each sampled fish until the expected number of samples is reached).

Is the sampling design compliant with the4S principle?:
NA.

Regional coordination:
Y. Sampling design and protocols were developed in the framework of the WGACEGG.

Link to sampling design documentation:
Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES Techniques in Marine Environmental Sciences* Vol. 64. 100 pp. Section 3.1.2
https://doi. org/10.17895/ices.pub.7462.

Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling schemes adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

Link to sampling protocol documentation:
Doray, M., Boyra, G., and van der Kooij, J. (Eds.). 2021. ICES Survey Protocols – Manual for acoustic surveys coordinated under the ICES Working Group on Acoustic and Egg Surveys for Small Pelagic Fish (WGACEGG). 1st Edition. *ICES Techniques in Marine Environmental Sciences* Vol. 64. 100 pp. Section 3.1.3
https://doi. org/10.17895/ices.pub.7462

Compliance with international recommendations:
Y. Most of these species are evaluated by international groups of experts, and their recommendations are taken into account and implemented. The sampling protocols adopted by the IEO are common within this SPF species group and standardised and coordinated by ICES expert groups.

AR comment: No deviations or developments.

Sampling implementation

Recording of refusal rate:
NA.

Monitoring of sampling progress within the sampling year:
NA. Pelagic hauls providing biological samples are opportunistic and are performed whenever changes are detected in echo-traces, and according to the survey time constraints. Nevertheless, the final number (20-25 hauls on average) and location of these hauls results in a relatively high sampling coverage of the GoC SPF community.

AR comment: No deviations or developments.

Data capture

Means of data capture:
Biological data from GoC Engraulis encrasicolus, Sardina pilchardus, Scomber scombrus, Scomber colias, Trachurus trachurus, Trachurus mediterraneus, Trachurus picturatus and Boops boops (from SRS samples of 50 individuals from the catch of pelagic hauls) are captured electronically with a tailored software/hardware system (icrOS) and data are subsequently uploaded to the IEO SIRENO database. The icrOS system simplest hardware setup comprises one or more sampling kiosks and a server connected in a local network. Each of those sampling kiosks is formed by a computer screen, a Raspberry Pi board, a waterproof keyboard and a mouse (**Figure 1**).

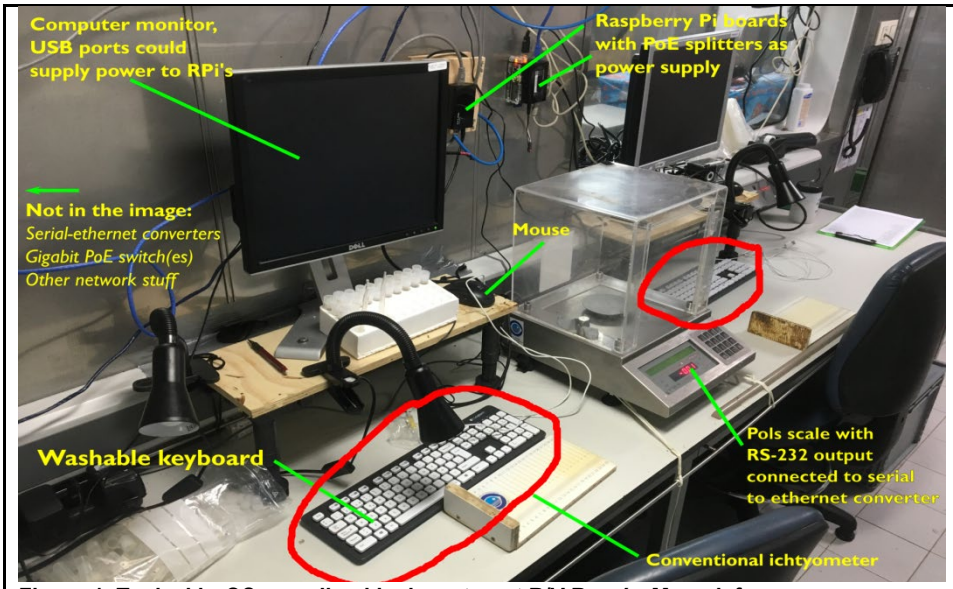


Figure 1. Typical icrOS sampling kiosks setup at R/V Ramón Margalef.

The server runs a PostgreSQL+PostGIS database where data from sampling is stored, a R-Shiny server for data quality checks and reports and a LTSP (Linux Terminal Server Project) which delivers the sampling software and applications to the sampling kiosks at boot time, easing the maintenance of the sampling software across the system.

Additional hardware such scales, GPS, echosounders, icrOS electronic measuring board, etc., can be connected to the system for data capture. In the case of scales, what is particularly recommended to reduce data errors due to bad weighing data recording, the system currently supports data capture from METTLER-TOLEDO, Marel and POLS scales. The icrOS electronic measuring board, however, is designed for sampling of length frequency distributions (LFD) and not for the biological sampling of the individual length measurement, despite it can be used as a conventional measuring board.

Label printers ZEBRA-ZPL2 language compatible can be connected to the system for printing specimen identification labels for labelling vials, etc. with a simple specimen code.

The sampling software consists in several applications for haul events data (position, time, depth...), catch sampling, LFD samplings and biological sampling. Biological sampling is performed using sampling protocols, defined before the sampling (**Figure 2**). For protocol definition, the user chooses the variables to be sampled (numerical for weight or length, categorical for keys, Boolean...) between a set of user defined variables and their sampling order, whether the variable value has a default value or not, if it can be locked (keep the value between specimens, useful when a given value, i.e., the same maturity appears across all the specimens). When the sampling starts, the sampling application reads the selected protocol (**Figure 3**), stored in the system database, and creates the user interface form for that protocol. This makes possible for the application to virtually sample any species (fishes, crustaceans...) if the proper protocol and variables have been defined for it.

The stages of the categorical variables (keys) are set at variable definition time. At sampling time, the user interface provides the user with drop-down lists for the categorical variables with that predefined stages, so the input of values not present in the keys is not possible, providing some extent of quality assurance to the system (**Figure 4**).

The sampling application can also be used for editing the values and samples previously input in case of error correction, and marking any individual variable of the sample as outlier/bad/invalid data is possible (i.e., after checking it is possible to mark as bad data only eviscerated weight for a particular sample, but the rest of the data remains valid).

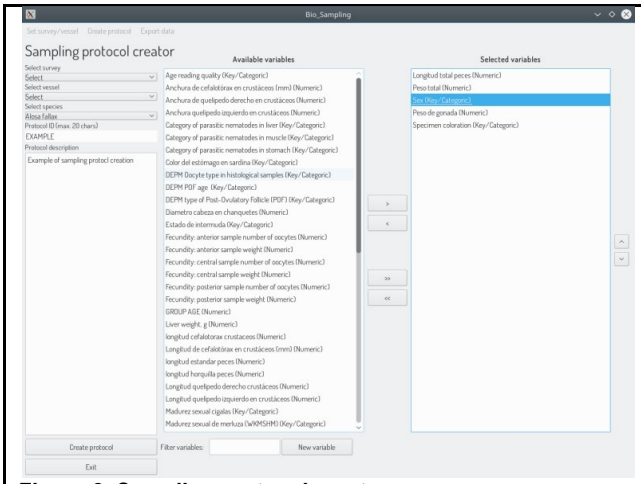


Figure 2. Sampling protocol creator.

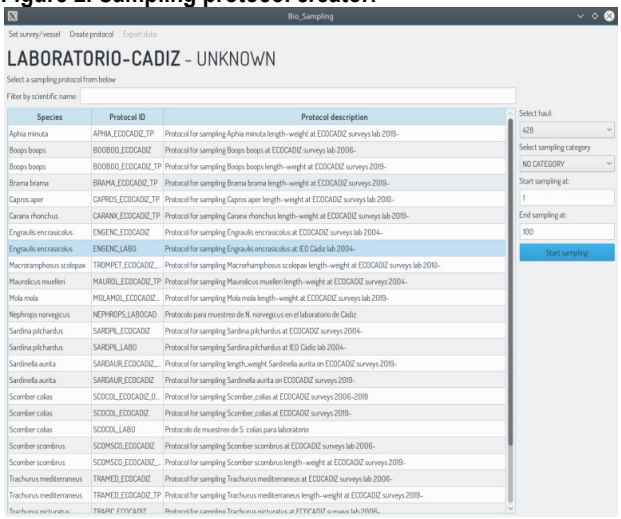


Figure 3. Selection of the sampling protocol.

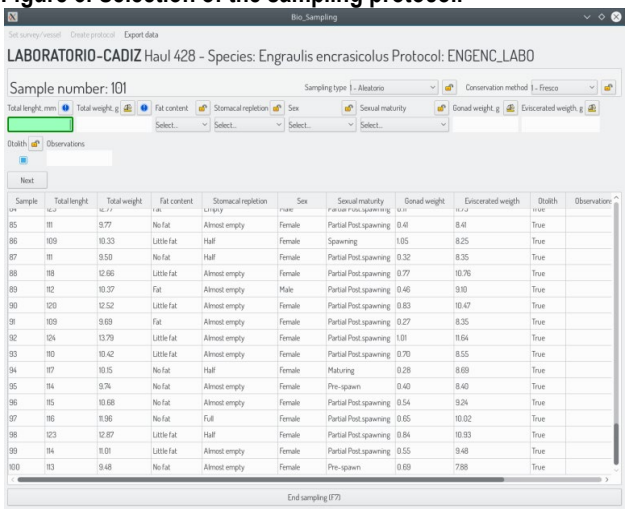


Figure 4. Biological sampling.

The system provides also applications for quality check, which are currently under development and also for data extraction and reporting. These applications are run in a R-Shiny server and can be accessed from any computer connected to the system network.

Data capture documentation:

For the icrOS software/hardware system a first description of the system can be found at ICES WKSEATEC (Workshop on Technical Development to Support Fisheries Data Collection) 2017 Report, pages 16-34 available at (https://www.ices.dk/publications/library/Pages/default.aspx#Default={%22k%22:%22wkseatec%22,%22r%22:[{%22n%22:%22owstaxIdPublicationYear%22,%22t%22:[%22\%22%C7%82%C7%824c307c2330383732633263262652d353934352d343662362d396663642d6565626466643830306666617c32303137\%22%22],%22o%2

2:%22and%22,%22k%22:false,%22m%22:null},{%22n%22:%22ReportAcronymOWSCHCS%22,%22t%22:[%22\%22%C7%82%C7%82574b534541544543\%22%22],%22o%22:%22and%22,%22k%22:false,%22m%22:null}]}

However, most recent description of the system can be found in the RCG NANSEA RCG Baltic 2021. Part I Report. 'New data sources and technology'. icrOS. Pgs 38-39. (https://datacollection.jrc.ec.europa.eu/docs/rcg).

Quality checks documentation:

No documentation targeting quality checks.

Analysis and detection of outliers for biological parameters, their weight–length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with (ggplot2 package), etc.

COST.

For small pelagic fish species sampled at ECOCADIZ-RECLUTAS, a R-Shiny application is used after sampling is complete for data checking. The application shows graphically the relationships between length, total, eviscerated and gonad weights, so outliers can be detected and corrected if necessary (**Figure 5**).

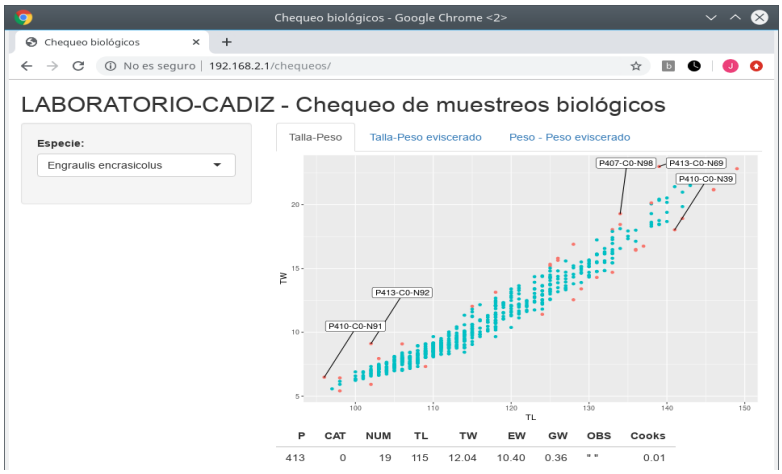


Figure 5. Application for data checking from biological sampling.

AR comment: No deviations or developments.

Data storage

National database:

SIRENO ("*Seguimiento Informático de los Recursos Naturales Oceánicos*") is the IEO fisheries and oceanographic Database.

International database:

NA.

Quality checks and data validation documentation:

No documentation targeting quality checks.

The icrOS system (GoC SPF species in 9a S), the icrOS system doesn't allow the occurrence of missing values/zeros in those variables defined as mandatory, i.e., total length or total weight.Analysis and detection of outliers for biological parameters, their weight–length relationships and ranges are carried out graphically using expert judgment, creating common graphs such as scatter plots, histograms, box plots in R with (ggplot2 package), etc.

AR comment: No deviations or developments.

Sample storage

Storage description:

The otoliths are kept in envelopes or vials, these placed in boxes duly labeled and stored on the shelves of the growth warehouses of the IEO oceanographic centres of Cádiz. These pieces are stored systematically, without expiration date.

AR comment: No deviations or developments.

Data processing

Evaluation of data accuracy (bias and precision):

N

Editing and imputation methods:

Y. Depending on the error it could be tackled correcting the sample data (like some typing errors), while others are excluded from output/calculations or marked as outliers/errors.

Age length key (ALK) of the commercial sampling is completed with the age-length survey data and the missing values are completed by an age expert judgement. In addition, in the case of maturity of anchovy from the Gulf of Cádiz, for maturity

ogives, missing maturity percentages are imputed from historical data. **Quality document associated to a dataset:** N **Validation of the final dataset:** Using the quality checks of the ICES acoustic database.
AR comment: No deviations or developments.

BFT-Index

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : SPAIN

Region: North-East Atlantic (Bay of Biscay**)**

Sampling scheme identifier: ESP_AZTI_BFT INDEX

Sampling scheme type: Research Survey at Sea

Observation type: SciObsAtSea

Time period of validity: from 2022 until 2027

Short description (max 100 words):
AZTI-BFT INDEX survey, carried out annually, is a systematic active acoustics survey aimed at detecting the bluefin schools present along its transects and estimating the number of individuals in each of them, for developing a fishery-independent abundance index for bluefin tuna in the Bay of Biscay.

Description of the population

Population targeted:.
The target species is the Atlantic bluefin tuna (*Thunnus thynnus*) and the survey area comprises ICES subdivisions 8cd, where a 960 nm zig-zag type systematic transect is performed.

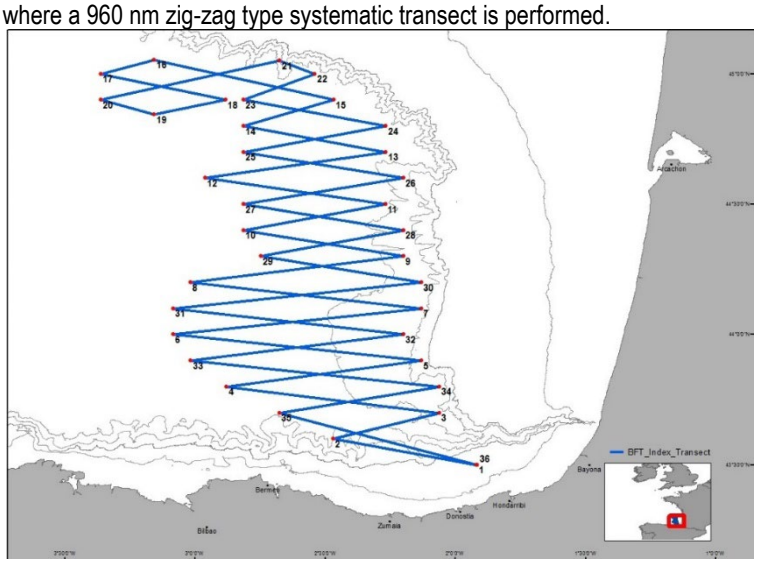
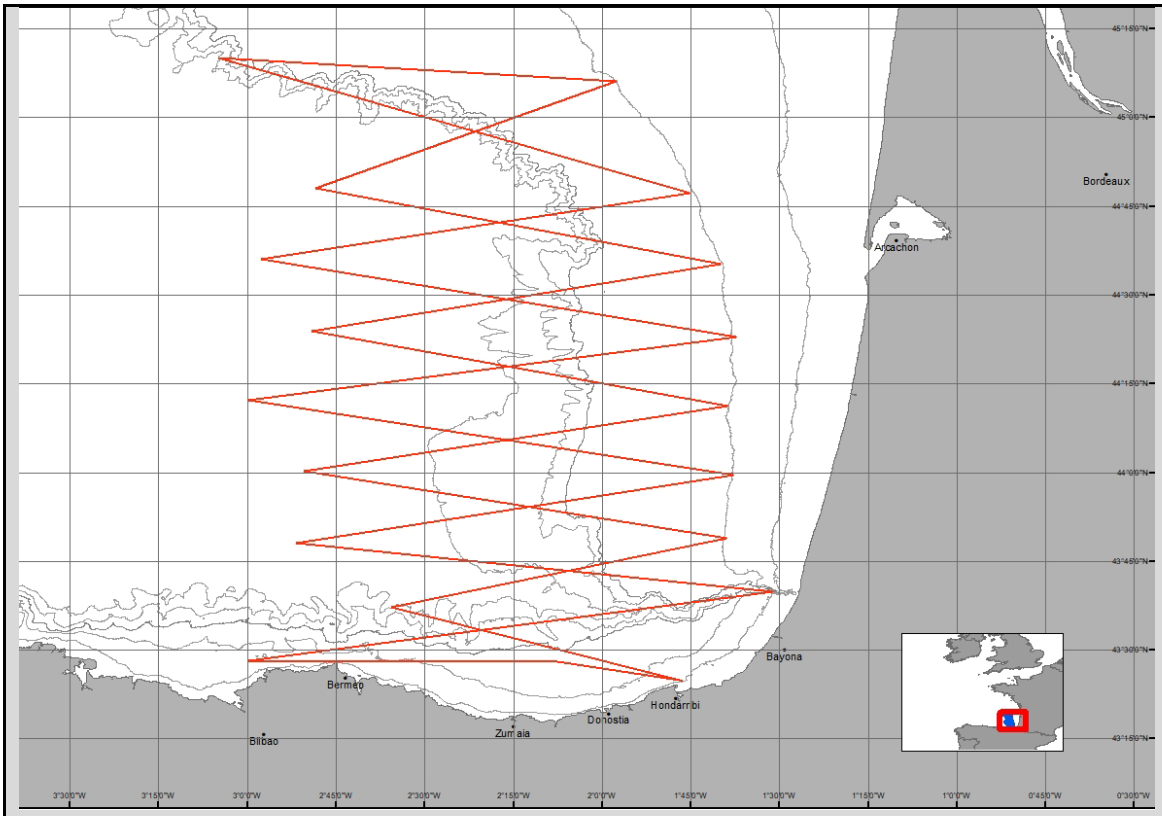


Figure 1: survey area and transects

Population sampled:
The part of the target population aimed at is the bluefin tuna present in the Bay of Biscay every summer in the framework of their annual feeding migration to this region, especially the juvenile cohorts (ages 1 to 4).

Stratification:.
NA

AR comment:
The survey transects have been modified in order to cover a bigger area, east boundary has been changed till 100 m isobath in the French continental shelf. North, west and south boundaries are still the same as well as the total length of the transects, 960 nm.



Sampling design and protocols

Sampling design description:.
No PSU applying. The sampling is adaptive, i.e. the survey sampling unit is each tuna detection occurring along the survey transects.

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

Regional coordination:
Sampling design and protocols were originally developed for the BFT Index survey, which is the only survey of its type so far, i.e. direct acoustic survey directed to bluefin tuna in the Bay of Biscay. Sampling design, protocols and first results have been presented in the ICCAT working group on bluefin tuna since 2015 (SCRS bluefin tuna species group meetings and bluefin tuna intersession meeting).

Link to sampling design documentation:.
Goñi N., Uranga J., Arregui I., Onandia I., Martinez U., Boyra G., Melvin G.D., Godard I., and Arrizabalaga H. (2019) Acoustic-based fishery-independent abundance index of juvenile bluefin tunas in the Bay of Biscay: results from the first five surveys. Document SCRS/2019/185
https://iccat.int/Documents/CVSP/CV076_2019/n_2/CV076020455.pdf

Compliance with international recommendations:
Y

Link to sampling protocol documentation:.
Goñi N., Uranga J., Arregui I., Onandia I., Martinez U., Boyra G., Melvin G.D., Godard I., and Arrizabalaga H. (2019) Acoustic-based fishery-independent abundance index of juvenile bluefin tunas in the Bay of Biscay: results from the first five surveys. Document SCRS/2019/185
https://iccat.int/Documents/CVSP/CV076_2019/n_2/CV076020455.pdf

Compliance with international recommendations:
Y

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: Indicate with 'Y' (yes) or 'N' (no), or 'NA' (not applicable, in case of research surveys). If 'N' (no), indicate when (year) documentation will be available.
NA

Monitoring of sampling progress within the sampling year: Indicate how sampling allocations are adjusted (if needed) and followed-up, what are the mechanisms in place to resolve issues and adopt mitigation measures

during the sampling year?
NA

AR comment: No deviations or developments

Data capture

Means of data capture:

The vessel hired for the survey sails along the defined transects (total length 960 nm). For the collection of acoustic records onboard, we use a MAQ omnidirectional sonar, set at a 320m range and 8º tilt angle, for tuna school detection. A scientific EK80 echosounder working at a combination of at least 3 frequencies mounted horizontally and vertically is recording acoustic backscattering during the whole survey. At each detection, the vessel approaches the school, and throws live bait for catching tuna by pole-and-line. Caught individuals are measured (fork-length) and immediately released. In complement of the physical size-sampling, a multibeam sonar (SIMRAD M3) is used for size-measurements of the tunas. EK80 recordings are then processed to estimate school dimension and number of individuals in each detected school.

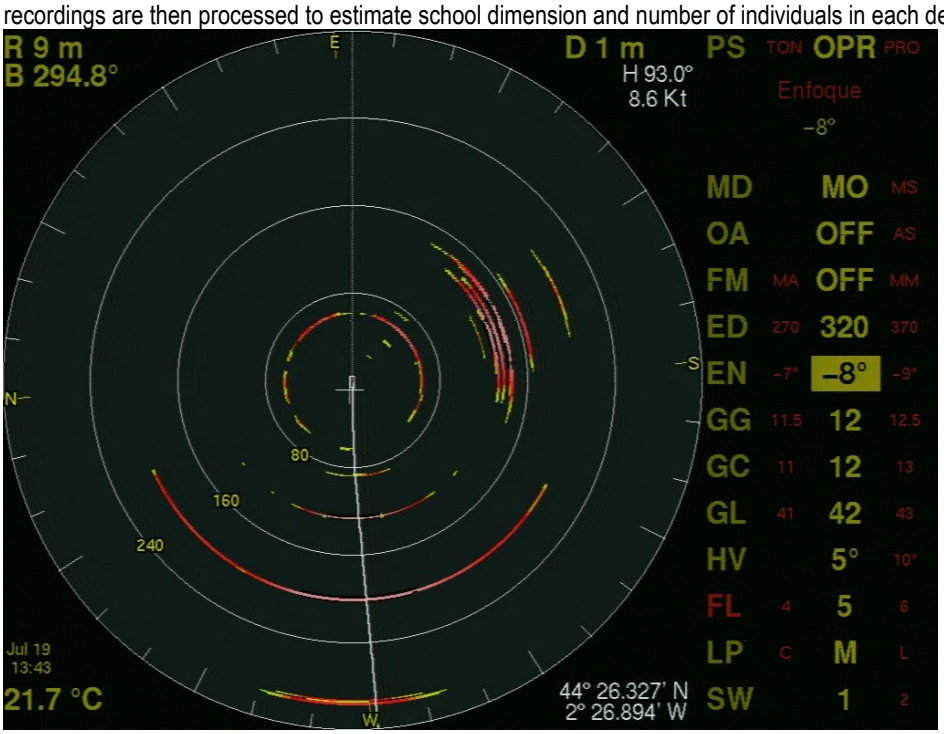


Figure 2: Example of detection of a bluefin tuna school by omnidirectional sonar (right part of the sonar screen).

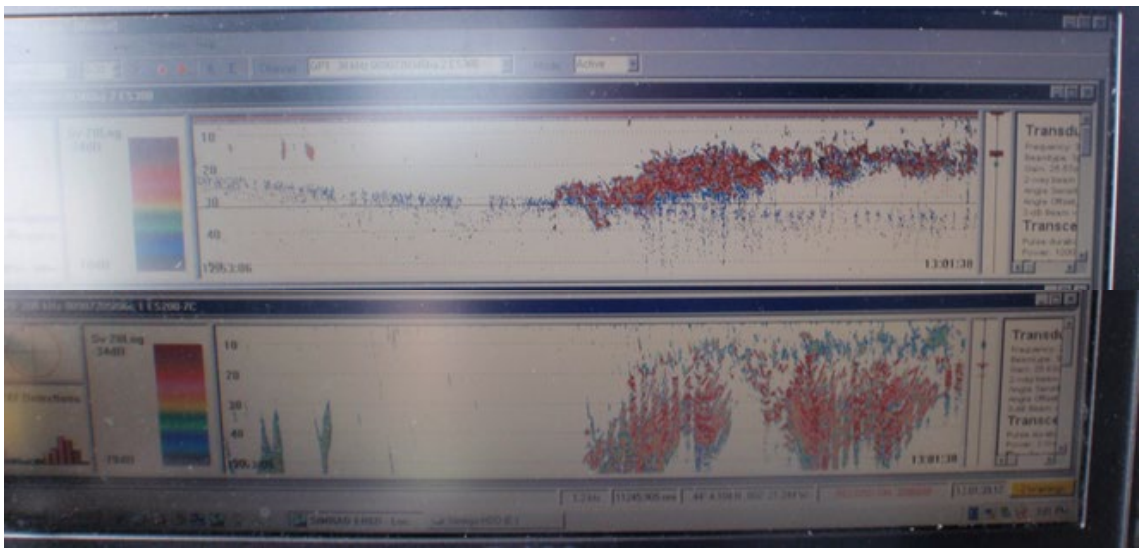


Figure 3: Example of bluefin tuna school detected by the EK80 echosounder, at 38 kHz mounted vertically (upper panel) and at 200 kHz mounted horizontally (lower panel).

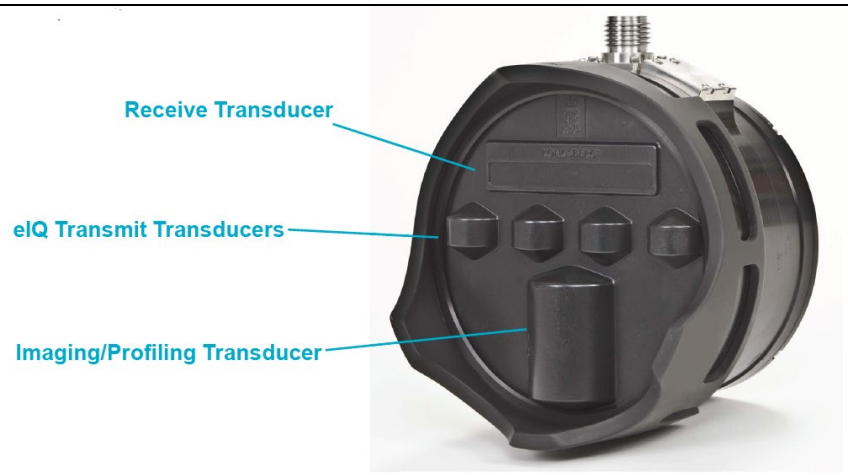


Figure 4: M3 mutibeam sonar used for complementary size measurements

Data capture documentation:

Goñi N., Uranga J., Arregui I., Onandia I., Martinez U., Boyra G., Melvin G.D., Godard I., and Arrizabalaga H. (2019) Acoustic-based fishery-independent abundance index of juvenile bluefin tunas in the Bay of Biscay: results from the first five surveys. Document SCRS/2019/185
https://iccat.int/Documents/CVSP/CV076_2019/n_2/CV076020455.pdf

Quality checks documentation:

N (2023)

AR comment: No deviations or developments

ESP-AZTI_OffSiteSurveysRecreational.

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region: North-East Atlantic

Sampling scheme identifier: ESP-AZTI_OffSiteSurveysRecreational

Sampling scheme type: recreational (off site surveys)

Observation type: SciObsOnShore

Time period of validity: from January 2022 until December 2027

Short description (max 100 words):
Sampling scheme aiming at collecting catch and effort data from marine recreational fisheries in the Basque Country, using offsite methods (surveys). Information is taken for sea bass and blue fin tuna. Cod, pollack and elasmobranchs are not target species for this fishery in the Basque Country.

Description of the population

Population targeted:
The population targeted are catches and effort.
The population targeted are fishers fishing Basque Country (BC) waters. This includes fishing from the coast, from a boat or spearfishing.

Population sampled:
The population sampled are fishers with a fishing license, and living in the BC.
In Spain, the licences for recreational fishing are mandatory for fisheres above 14 years old, and they are delivered by regional authorities. The sampling frame is build from the list of licences delivered by the Government of the BC. Only people living in the BC is included in the sampling frame.
Some fishers didn't provide their telephone number or email when taking out the license. Those fishers are not reachable

Stratification:
No stratification

AR comment:

The routinary survey, carried out from 2015 to 2019 and based on the list of telephones of licensed fishers, could not be done due to problems with the Data Protection Regulation. It was not possible to access to the contact information of licensed fishers. This problem had been identified in previous years and some actions were proposed to overcome it (i.e. changes in the web where fishers buy their license), but the problem persists.

A new sampling scheme for offsite surveys in the Basque Country has been designed during 2022 and will be carried out during 2023.

Short description:

Sampling scheme aiming at collecting catch and effort data from marine recreational fisheries in the Basque Country, using offsite methods (surveys). The objective is to get an estimation of the participation rate in the Basque Country (until now we were using the list of licensed fishers), by recreational fishing mode (i.e. coastal fishing, boat fishing, spearfishing), region and season. In addition, the survey is multi-specific, so it will allow us defining the main target species as well as estimating both the dedicated fishing effort and corresponding catches.

Population targeted:
The population targeted is the population of the Basque Country avobe 18 years old. This include both fishers and non-fishers.

.

Population sampled:
The population sampled is the population of the Basque Country avobe 18 years old, owning a telephone in the Data Base of a Company specialized in telephone surveys, which has been subcontracted. This Data Base is considered representative of the whole population o the Basque Country (avobe 18 years old)

Stratification:
Geographical straitification.

Sampling design and protocols

Sampling design description:
Sampling Frame: List of licences
PSU: individual fishers
Sampling frame: list of fishers with licence, living in the BC, and who provided contact information when taking out the license
Selection method: simple random sampling without replacement
Periodicity: 6 -months (although it can vary)
Contact method: telephones and emails are taken from the list of licences
Survey method: telephone and email surveys
More details about the sampling design can be found in AZTI's Fisheries Data Sharepoint (link)
An example of the surveys can be found in AZTI's Fisheries Data Sharepoint (link)

Is the sampling design compliant with the 4S principle?:
It has been designed to comply with the 4S principle as much as possible

Regional coordination:
Protocols have not been developed regionally, but recommendations coming from regional Expert Groups (ICES WGRFS) have been followed

Link to sampling design documentation:
More details about the sampling design can be found in AZTI's Fisheries Data Sharepoint (link)

Compliance with international recommendations:
Y. Recommendations coming from regional Expert Groups (ICES WGRFS) have been followed

Link to sampling protocol documentation:
More details about the sampling protocol can be found in AZTI's Fisheries Data Sharepoint (link)

Compliance with international recommendations:
Y. Recommendations coming from regional Expert Groups (ICES WGRFS) have been followed

AR comment:

Sampling design description:
Sampling Frame: Data Base of telephones of the papulation of te Basque Country over 18 years old. The Data Base os propierty of the Company subcontracted to do the surveys and it is representative of the whole population
PSU: individual fishers
Selection method: simple random sampling without replacement
Periodicity: The survey was designed in 2022 and will be carried out in 2023. This is a new sampling and the periodicity is not set yet
Contact method: telephone call
Survey method: telephone surveys

Is the sampling design compliant with the 4S principle?:
It has been designed to comply with the 4S principle as much as possible

Regional coordination:
Protocols have not been developed regionally, but recommendations coming from regional Expert Groups (ICES WGRFS) have been followed

Link to sampling design documentation:
More details about the sampling design can be found in AZTI's Fisheries Data Sharepoint (link)

Compliance with international recommendations:
Y. Recommendations coming from regional Expert Groups (ICES WGRFS) have been followed

Sampling implementation

Recording of refusal rate:
Y

Monitoring of sampling progress within the sampling year:
NA

AR comment: No deviations or developments

Data capture

Means of data capture:
An example of the surveys can be found in AZTI's Fisheries Data Sharepoint (link)

The results from telephone surveys are stored by the interviewers in excel files.

The results from email surveys are stored automatically in excel files which can be downloaded from the platform (SurveyMonkey).

Data capture documentation:
The results from telephone surveys are stored by the interviewers in excel files.

The results from email surveys are stored automatically in excel files which can be downloaded from the platform (SurveyMonkey).

Quality checks documentation:
Collected data are checked for quality. Expert judgement is applied to correct impossible values (errors in the answers). Outliers are identified.

AR comment:
The results from telephone surveys are stored by the interviewers in excel files.
No email surveys were conducted, and therefore there are no results for those type of surveys

Data storage

National database:
Results are stored in excel files

International database:
The data are used to answer ICES general data call

Quality checks and data validation documentation:
NA

AR comment:
The data call could not be answered in 2022. It will be answered in 2023

Sample storage

Storage description:
NA

Sample analysis:
NA

AR comment: No deviations or developments

Data processing

Evaluation of data accuracy (bias and precision):
Estimates are calculated using the package Rsurveys. Standard error is calculated

Editing and imputation methods:
NA

Quality document associated to a dataset:
NA

Validation of the final dataset:
NA

AR comment: No deviations or developments

SelfOnShore_recreational (off site surveys).

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic and Mediterranean Sea

Sampling scheme identifier : SelfOnShore_recreational (off site surveys)

Sampling scheme type: recreational (off site surveys)

Observation type: SelfOnShore

Time period of validity : from January 2022 until December 2027

Short description (max 100 words):

Sampling scheme aiming at collecting catch and effort data from marine recreational fisheries.

According to RD 347/2011, all recreational fishermen must report their catches, so there is no sampling scheme.

Description of the population

Population targeted:

NA.

Population sampled:

NA.

Stratification:

NA.

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:

NA.

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

NA.

Regional coordination:

NA.

Link to sampling design documentation:

NA.

Compliance with international recommendations:

NA.

Link to sampling protocol documentation:

NA.

AR comment: No deviations or developments**.**

Sampling implementation

Recording of refusal rate:

NA.

Monitoring of sampling progress within the sampling year:

NA.

AR comment: No deviations or developments

Data capture

Means of data capture:

NA.

Data capture documentation:

NA.

Quality checks documentation:

NA.

AR comment: No deviations or developments

Data storage

National database:

NA.

International database:

NA.

Quality checks and data validation documentation:

NA.
AR comment: No deviations or developments
Sample storage
NA.
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA. **Editing and imputation methods:** NA. **Quality document associated to a dataset**: NA. **Validation of the final dataset**: NA.
AR comment: No deviations or developments

ANG_Anda_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS :ESP

Region : North-East Atlantic and Mediterranean and Black Sea

Sampling scheme identifier : ANG_Anda_SciObs water body_Diadromous (scientific)

Sampling scheme type: Diadromous (scientific**)**

Observation type: SciObs water body

Time period of validity : 2022-2027

Short description (max 100 words):
Sampling plan for the evolution of eel stocks in Andalucia.

Description of the population

Population targeted: *Anguilla anguilla*
Population sampled: *Anguilla Anguilla* from EMU_ES_Anda
Stratification: The population sampled is the portion of adult eels (yellow and silver) that begin their migration in rivers downstream to the sea. Upstream reaches of dams are excluded from the sampling, as it is practically impossible for the eels living there to reach lower levels. The rivers to be sampled were chosen from among those with European eel populations. As the Autonomous Community of Andalusia is divided into three Eel Management Units: Atlantic, Guadalquivir and Mediterranean; a representative number of rivers have been taken in each of the Management Units. On the other hand, the number of sampling stations per river is determined by the length of the river, with more sampling stations in longer rivers.
The primary unit is the sampling point, of which there are 40 in total, distributed as follows by province:
- Sevilla. Guadiamar River (3 stations) and Guadaira River (5 stations). Corresponding to the Guadalquivir Eel Management Unit.
- Cádiz. Guadalete River (7 stations) and Barbate River (12 stations), belonging to the Atlantic Eel Management Unit; and Palmones River (6 stations) and Guadarranque River (3 stations), belonging to the Mediterranean Eel Management Unit.
- Málaga. River Guadalhorce (4 stations), belonging to the Mediterranean Eel Management Unit.

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:
Forty stations have been designated in the three Management Units: 8 in the Guadalquivir UGA, 12 in the Mediterranean UGA and 20 in the Atlantic UGA. Each station will be sampled once a year, preferably in winter and avoiding full moon days.
At each station 20 pots will be installed (10 per bank alternating eel and shrimp traps), with an approximate separation of 20 metres (so each station must have at least a length of 400m) and will be fixed with corrugated steel bars fixed to the bed. Their exact location will be recorded by GPS when the satellite error is less than 6 metres. The pots shall be installed in the direction of the end point (downstream). Three-kill eel pots and two-kill shrimp pots shall be used, according to the attached graph showing dimensions and design:
Catches shall be collected 48 hours after installation and the pots shall be lifted in the same order of setting (from start to end point). The eels caught shall be placed in a suitable container on the shore where they shall be weighed, measured and the various distinguishing parameters to determine the degree of maturity (eye diameter, presence of lateral line and fin colouring) shall be recorded. The eels shall be returned to the water as close as possible to the stretch where they were caught.
Is the sampling design compliant with the 4S principle?: NA
Regional coordination: No.
Link to sampling design documentation: Fernández Delgado, C. (2017), Sampling protocol. Internal report.

Compliance with international recommendations: It is not known whether it is in line with international recommendations. The methodology used is described below. **Link to sampling protocol documentation**: Fernández Delgado, C. (2017), Sampling protocol. Internal report.

AR comment: No deviations or developments

Sampling implementation

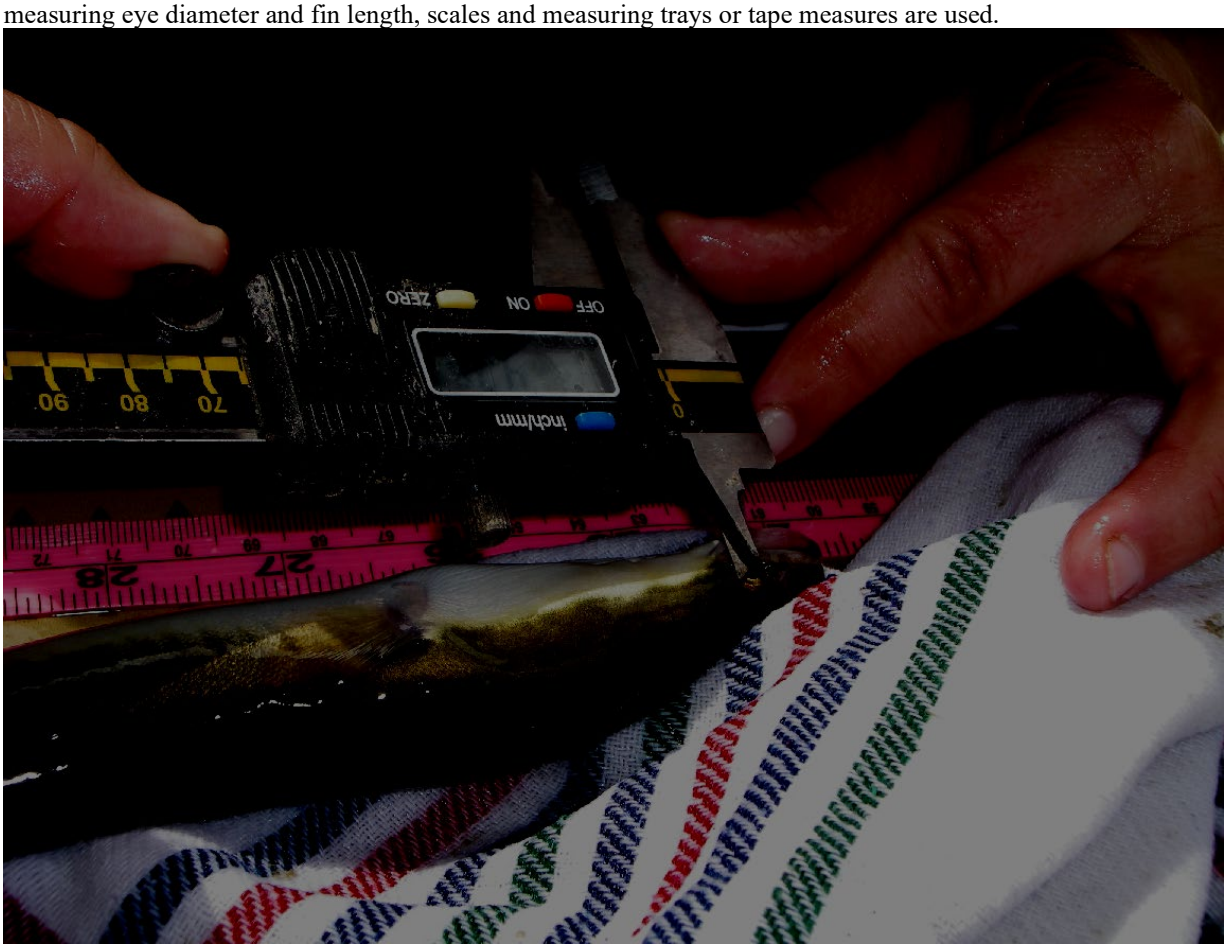
Recording of refusal rate: N

Monitoring of sampling progress within the sampling year: The sampling stations are always the same. The scientific advice of the Eel Management Plan provided 47 sampling stations at the beginning of the study, from which the 7 least viable for sampling had to be discarded, leaving 40 census stations, which are sampled annually.

AR comment: No deviations or developments

Data capture

Means of data capture: Catching methods are eel pots and shrimp traps. In addition, digital calipers for measuring eye diameter and fin length, scales and measuring trays or tape measures are used.



Data capture documentation: Yes
Quality checks documentation: N. It is not known when the documentation will be available.

AR comment: No deviations or developments

Data storage

National database: NA
International database: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx)
Quality checks and data validation documentation: NA

AR comment: No deviations or developments

Sample storage

NA

AR comment: No deviations or developments

Data processing

Evaluation of data accuracy (bias and precision): N. The data collected during the campaigns carried out between 2018 and 2020 have been sent to the University of Cordoba for analysis. The evaluation of these data is pending. The date of delivery is unknown.
Editing and imputation methods: N. The date of delivery of the data evaluation is not known..
Quality document associated to a dataset: Is there a publication digital object identifier (DOI) created? Is there a document summarising the estimation process followed? N
Validation of the final dataset: The validation of the data would be carried out by the staff of the Consejería de Agricultura,Ganadería, Pesca y Desarrollo Sostenible (Regional Ministry of Agriculture, Livestock, Fisheries and Sustainable Development).

AR comment: No deviations or developments

ANG_Astu_SciObs water body_Diadromous (commercial)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier : ANG_Astu_SciObs water body_Diadromous (commercial**)**

Sampling scheme type: Diadromous (commercial)

Observation type: SciObs water body

Time period of validity : 2022-2027

Short description (max 100 words):
Total recruit estimated from daily catches report of commercial fisheries

Description of the population

Population targeted: *Anguilla anguilla*
Population sampled: *Anguilla Anguilla* from EMU_Astu
Stratification:
Glass eel catches from Nalon management plan are reported by 2 fishermen´s guilds (Cudillero and San Juan de la Arena)
Catches from Tinamayor management plan are reported by 1 fishermen´s guild (Bustio)
From the rest of shore (free area), catches can be reported by any fishermen´s guild (18 in our region)

AR comment:
In 2022 the formerly called "free zone" was divided in three glass eel fishing areas. One of them was established as a new management plan (Eastern MP) whose data are reported by Ribadesella guild. The data from the Western Zone and the Center Zone are reported by one of the 18 asturian guilds.

Sampling design and protocols

Sampling design description:
Professional fishery of glass eel is allowed from November to February, with a break of at least 5 days a month. Also, glass eel fishermen from boat cannot fish for a month during the campaign.
There are two specific glass eel fishing management plans:
-Nalon management plan: glass eel fishery is allowed only at Nalon estuary and San Pedro de la Ribera and Quebrantos beaches, done by 36 fishermen from boat and 48 on foot.
-Tinamayor management plan: glass eel fishery is allowed only at Deva estuary and Cabra river, done by 20 fishermen on foot.
The rest of shore is named "free area", where glass eel fishery is allowed in any river unless Nalon and Deva estuary, done by a maximum of 84 fishermen on foot.
Catches are conducted by mean of a sieve net for fishery on foot. For fishery from boat, catches are made with a pair of nets placed on both sides of the boat, maximum size 200x60 cm.
Total catches per night and fisherman are reported.
Is the sampling design compliant with the 4S principle?: NA
Regional coordination: Regional coordination.
Link to sampling design documentation: NA
Compliance with international recommendations: NA
Link to sampling protocol documentation: NA

AR comment:
THE TEXT:
"There are two specific glass eel fishing management plans:

-Nalon management plan: glass eel fishery is allowed only at Nalon estuary and San Pedro de la Ribera and Quebrantos

beaches, done by 36 fishermen from boat and 48 on foot.

-Tinamayor management plan: glass eel fishery is allowed only at Deva estuary and Cabra river, done by 20 fishermen on foot.

The rest of shore is named “free area”, where glass eel fishery is allowed in any river unless Nalon and Deva estuary, done by a maximum of 84 fishermen on foot.”

MUST BE:

“There are three specific glass eel fishing management plans and two zones out of the plans:

-Nalon management plan: glass eel fishery is allowed only at Nalon estuary and San Pedro de la Ribera and Quebrantos beaches, done by 36 fishermen from boat and 48 on foot.

-Tinamayor management plan: glass eel fishery is allowed only at Deva estuary and Cabra river, done by 20 fishermen on foot.

- Eastern management plan: glass eel fishery is allowed from Purón river until Libardón river, done by 46 fishermen on foot.

- Western Zone: glass eel fishery is allowed from Eo river until Esqueiro river, done by 12 fishermen on foot.

- Central Zone: glass eel fishery is allowed from Esqueiro river until Frayón river, done by 17 fishermen on foot.”

Sampling implementation

Recording of refusal rate: **NA**
Monitoring of sampling progress within the sampling year: Sampling allocations are fixed

AR comment: No deviations or developments

Data capture

Means of data capture: By means of dedicated software
Data capture documentation: NA
Quality checks documentation: NA

AR comment: No deviations or developments

Data storage

National database: Dirección General de Pesca Marítima, Consejería de Medio Rural y Cohesión territorial, Principado de Asturias.
https://tematico.asturias.es/dgpesca/din/estalonj.php
International database: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx)
Quality checks and data validation documentation: NA

AR comment: No deviations or developments

Sample storage

No sample storage

AR comment: No deviations or developments

Data processing

Evaluation of data accuracy (bias and precision): NA
Editing and imputation methods: NA
Quality document associated to a dataset: NA
Validation of the final dataset: NA

AR comment: No deviations or developments

ANG_Astu_SciObs water body_Diadromous (market)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : ANG_Astu_SciObs water body_Diadromous (market)
Sampling scheme type: Diadromous (market)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): 50 glass eels are collected from Ribadesella fishermen´s guild (Sella river basin) and 50 from San Juan de la Arena fishermen´s guild (Nalon river basin), once a month, during the glass eel fishing period (from November to February). Total: 400 glass eels.
Description of the population
Population targeted: *Anguilla anguilla* **Population sampled**: *Anguilla Anguilla* from EMU_ES_Astu .**Stratification**: Glass eel collected at the two major fishermen´s guilds for glass eel marketing in the Principality of Asturias Samples from two fishermens´s guilds, belonging to Nalon and Sella basins.
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: 50 individuals collected from the two main fishermen´s guilds, from November to February (4 months). The samples are preserved alive and taken to the laboratory. Each glass eel is measured total length and weight, and the pigmentation phase is noted. After measuring, the individuals are released into the river. **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: Regional coordination **Link to sampling design documentation**: N **Compliance with international recommendations**: N **Link to sampling protocol documentation**: N
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**: Sampling allocations are fixed.
AR comment: No deviations or developments
Data capture
Means of data capture: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Data capture documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality checks documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
AR comment: No deviations or developments
Data storage
National database: Centro de Experimentación Pesquera, Dirección General de Pesca Marítima, Consejería de

Medio Rural y Cohesión Territorial del Principado de Asturias **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
No samples storage
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): N **Editing and imputation methods:** NA **Quality document associated to a dataset**: N **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_Astu_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier : ANG_Astu_SciObs water body_Diadromous (scientific)

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity : 2022-2027

Short description (max 100 words):
Electrofishing is carried out in order to collect length and weight from every eel captured, and in case of eels longer than 30 cm, also pectoral fin length and vertical and horizontal eye diameters to determine silvering and sex by Durif.

Description of the population

Population targeted: *Anguilla anguilla*
Population sampled:
Eel from EMU_ES_Astu
Stratification:
Yellow and silver eels_30 locations belonging to 8 river basins in EMU_ES_Astu

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:
30 sampling stations located in 8 river basins. Electrofishing is carried out once a year, from September the 8th from October the 12th, by Zippin method, with three passes without replacement, following UNE-EN-14011:2003.
Every eel is measured and weighed. In case of eels longer than 30 cm, data of pectoral fin length and vertical and horizontal diameters are also taken, following the SUDOANG protocol https://sudoang.eu/wp-content/uploads/2019/03/EN-EEL_SAMPLING_PROTOCOLS_SUDOANG.pdf
Is the sampling design compliant with the 4S principle?: NA
Regional coordination: Regional coordination
Link to sampling design documentation:
https://www.une.org/encuentra-tu-norma/busca-tu-norma/norma/?c=N0029997
https://sudoang.eu/wp-content/uploads/2019/03/EN-EEL_SAMPLING_PROTOCOLS_SUDOANG.pdf
Compliance with international recommendations: 'Y'
Link to sampling protocol documentation:
https://www.une.org/encuentra-tu-norma/busca-tu-norma/norma/?c=N0029997
https://sudoang.eu/wp-content/uploads/2019/03/EN-EEL_SAMPLING_PROTOCOLS_SUDOANG.pdf

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: 'NA'
Monitoring of sampling progress within the sampling year:
Sampling allocations are adjusted if needed under CEP and University of Oviedo criteria. In 2019, a sampling station was replaced for a new one placed in a wider part of the river (another category) following the SUDOANG protocol.

AR comment: No deviations or developments

Data capture

Means of data capture:
https://sudoang.eu/wp-content/uploads/2019/03/EN-EEL_SAMPLING_PROTOCOLS_SUDOANG.pdf
Data capture documentation:
https://sudoang.eu/wp-content/uploads/2019/03/EN-EEL_SAMPLING_PROTOCOLS_SUDOANG.pdf
Quality checks documentation: 'Y'

AR comment: No deviations or developments

Data storage

National database: Centro de Experimentación Pesquera, Dirección General de Pesca Marítima, Consejería de Medio Rural y Cohesión Territorial del Principado de Asturias. In addition, the SUDOANG project has compiled various eel information from electroishing data from the SUDOANG project are hosted at https://bit.ly/3iIgtrT.
International database: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx)
Quality checks and data validation documentation:
https://sudoang.eu/wp-content/uploads/2019/03/EN-EEL_SAMPLING_PROTOCOLS_SUDOANG.pdf

AR comment: No deviations or developments

Sample storage

Otholits from eels collected during 2019 and 2020 electrofishings are preserved dry in Eppendorfs at the laboratory of the Centro de Experimentación Pesquera (CEP), Dirección General de Pesca Marítima, Consejería de Medio Rural y Cohesión Territorial, Principality of Asturias.
Sample analysis: Protocol https://sudoang.eu/es/grupos-de-trabajo/

AR comment: No deviations or developments

Data processing

Evaluation of data accuracy (bias and precision): https://sudoang.eu/es/visuang/
Editing and imputation methods: https://sudoang.eu/es/visuang/
Quality document associated to a dataset: https://sudoang.eu/es/visuang/
Validation of the final dataset: https://sudoang.eu/es/visuang/

AR comment: No deviations or developments

ANG_ Basq_SciObs water body_Diadromous (recreational)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : ANG_Basq_SciObs water body_Diadromous (recreational)
Sampling scheme type: Diadromous (recreational)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): It is mandatory to fill in the Daily Catches report with catches and effort data. These notebooks are compiled by the Basque Government, which sends them to AZTI. AZTI enters this information into the database and analyzes it.
Description of the population
Population targeted: *Anguilla anguilla* **Population sampled**: *Anguilla anguilla* from EMU_ES_Basq **Stratification**: All the catches and effort in the EMU_ES_Basq is recorded.
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: There is no protocol, the catches and efforts of all recreational glass eel fishermen in the Basque Country are collected. However, the method of collection is described in: Korta, M., Diaz, E. (2017) Report on eel stock, fishery and other impacts, in Spain. Report of the EIFAAC/CIEM/GFCM joint working group on eel (WGEEL), 3-10 October 2017, Kavala, Greece. ICES CM 2017/ACOM:15. 99 pp. https://www.ices.dk/sites/pub/Publication%20reports/expert%20group%20report/acom/2017/WgeeL/wgeel_2017.pdf **Is the sampling design compliant with the 4S principle?**: ***NA*** **Regional coordination**: ***N*** **Link to sampling design documentation**: ***NA*** **Compliance with international recommendations**: ***N*** **Link to sampling protocol documentation**: ***N***
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: ***N*** **Monitoring of sampling progress within the sampling year**: ***N***
AR comment: No deviations or developments
Data capture
AR comment: No deviations or developments
Means of data capture: NO PERTINENT **Data capture documentation**: NO PERTINENT **Quality checks documentation**: *N*
AR comment: No deviations or developments

Data storage:
National database: *NA* **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: the ices eel working group (WGEEL) reviews the information before incorporating it into its database.
AR comment: No deviations or developments
Sample storage: No pertinent.
AR comment: No deviations or developments
Data processing
AR comment: No deviations or developments
Evaluation of data accuracy (bias and precision): N **Editing and imputation methods: N.** **Quality document associated to a dataset**: **N.** **Validation of the final dataset**: **N.**
AR comment: No deviations or developments

ANG_ Basq_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier : ANG_ Basq_SciObs water body_Diadromous (scientific)

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity : 2022-2025

Short description (max 100 words):
Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip

Description of the population

Population targeted: *Anguilla anguilla*
Population sampled: *Anguilla Anguilla* from EMU_ES_Basq
Stratification: recruits, standing stock and silver eel from Oria River

AR comment: Indicate any deviations or developments. Do not change the text already adopted in the work plan.

Sampling design and protocols

Sampling design description:
1)The abundance of recruits will be estimated by:
a.Monthly samplings of the glass eel entrance in the estuary using sieve trawling during the maximum recruitment period (October- Frebuary). ¡
b.Using the glass eel fishery catch and effort data compiled in the daily catches report.
c.Sampling daily the eel entrance in a fish trap located in the tidal limit of the Oria River during the migration period (May-October)
2)The abundance of the standing stock (yellow eel); will be determined by electrofishing surveys in 25 sampling points.
3)The number or weight and sex ratio of emigrating silver eels will be determined applying Durif et al. (2003; 2005) to the eels obtained in the electrofishing surveys.
Is the sampling design compliant with the 4S principle?: Y
Regional coordination: Regional coordination
Link to sampling design documentation: Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
Compliance with international recommendations: Y
Link to sampling protocol documentation: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: NA
Monitoring of sampling progress within the sampling year: Sampling allocations are fixed

AR comment: No deviations or developments

Data capture

Means of data capture: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip

Data capture documentation: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality checks documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
AR comment: No deviations or developments
Data storage
National database: The SUDOANG project has compiled various eel information from Spain that can be found at: - Electroishing data from the SUDOANG project are hosted at https://bit.ly/3iIgtrT. - Recruitment and estimated escapement data can be downloaded from the interactive tool VISUANg (https://sudoang.eu/en/visuang/) - Data generated in the Oria, can be downloaded from the interactive tool VISUANg (https://sudoang.eu/en/visuang/) **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
No samples storage
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Editing and imputation methods:** https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality document associated to a dataset**: No **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_Cant_SciObs water body_Diadromous (commercial)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier: ANG_Cant_SciObs water body_Diadromous (commercial)
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words) Glass eel catches
Description of the population
Population targeted: Anguilla anguilla **Population sampled**: Anguilla Anguilla from EMU_ES_Cant **Stratification**: All the rivers from EMU_ES_Cant where Glass Eel fishery happens
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: Nowadays, only professional glass eel fishery exists in Cantabria, mainly located in the Deva, Nansa, Pas and Campiazo river basin s. Recreational fishery was forbiden in 2015. Professional fishermen sell their catches in the market or in other licensed establishments. Fishermen fish in land and they are only allowed to use one sieve (≤1.2 m2) per fishermen. Since 2005, fishermen report their catches. **Is the sampling design compliant with the 4S principle?**: Y **Regional coordination**: Regional coordination **Link to sampling design documentation**: NA **Compliance with international recommendations**: NA **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**: Sampling allocations are fixed
AR comment: No deviations or developments
Data capture
Means of data capture: NA **Data capture documentation**: NA **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: NA **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage

No samples storage
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** MA **Quality document associated to a dataset**: No **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_Cant_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : ANG_Cant_SciObs water body_Diadromous (scientific)
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words) Yellow and silver eel electrofishing surveys
Description of the population
Population targeted: *Anguilla anguilla* **Population sampled**: *Anguilla anguilla* from EMU_ES_Cant **Stratification**: Agüera River basin, Asón river basin, Miera River basin, Pas river basin, Saja-Besaya river basin, Nansa river Basin, Cantabrian Deva river basin, West Coastal basin and East Coastal basin .
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: The abundance of the standing stock (yellow eel); will be determined by electrofishing surveys in 125 sampling points with Carle & Strub 1978. **Is the sampling design compliant with the 4S principle?**: Y **Regional coordination**: Regional coordination **Link to sampling design documentation**: "Seguimiento de las poblaciones de peces continentales de Cantabria- Años 2010-2020- Ecohydros – Gobierno de Cantabria" (internal report). Not available online **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**: Sampling allocations are fixed
AR comment: No deviations or developments
Data capture
Means of data capture: "Seguimiento de las poblaciones de peces continentales de Cantabria- Años 2010-2020- Ecohydros – Gobierno de Cantabria" (internal report). Not available online **Data capture documentation**: "Seguimiento de las poblaciones de peces continentales de Cantabria- Años 2010-2020- Ecohydros – Gobierno de Cantabria" (internal report). Not available online **Quality checks documentation**: "Seguimiento de las poblaciones de peces continentales de Cantabria- Años 2010-2020- Ecohydros – Gobierno de Cantabria" (internal report). Not available online
AR comment: No deviations or developments
Data storage
National database: - Electrofishing data from EMU_CANt have been compiled in thef the SUDOANG project are hosted at https://bit.ly/3iIgtrT. **International database**: NA **Quality checks and data validation documentation**: NA

AR comment: No deviations or developments
Sample storage
No samples storaged
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** MA **Quality document associated to a dataset**: No **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_ Cat_SciObs water body_Diadromous (commercial)_GE_RWL

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : Mediterranean and Black Sea

Sampling scheme identifier : ANG_Cat_SciObs water body_Diadromous (commercial)_GE_RWL

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity : 2022-2025

Short description (max 100 words):
Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip

Description of the population

Population targeted: *Anguilla anguilla*
Population sampled: *Anguilla Anguilla* Glass eel from EMU_ES_Cata
Stratification: All the rivers in EMU_Cata with Glass eel fishery

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:
Girona: commercial fishery of glass eel is only allowed in 4 rivers done by 12 fishermen associated to 3 different fisherman guilds. Fisheries are allowed from October to March, only at night and a limit of sampling points (sampling point=trap) per river. Catches are conducted by means of a modified fyke net placed in the shoreline, near the river mouth. Total catches per night and fisherman are reported.

Ebro: commercial fishery of glass eel is allowed in almost 250 sampling points along the river, lagoons and canals managed by 5 different fisherman guilds. Fisheries are allowed from October to March, only at night and a limit of sampling points (sampling point=trap). Catches are conducted by means of a modified fyke net placed in the shoreline, near the river mouth, lagoon or canal. Total catches per night and fisherman are reported.

For length and weight measures glass eels are obtained from four sampling points in the Ebro. Sampling three times from October to March by professional fishermen. For each sampling point, 50 individuals are preserved alive and transported to the lab to measure total length (±1mm) the following day. After measuring, the individuals are released into the river. Following SUDOANG protocol.

Is the sampling design compliant with the 4S principle?: Y
Regional coordination: Regional coordination
Link to sampling design documentation: Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
Compliance with international recommendations: Y
Link to sampling protocol documentation: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: NA
Monitoring of sampling progress within the sampling year: Sampling allocations are fixed

AR comment: No deviations or developments

Data capture
Means of data capture: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Data capture documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality checks documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
AR comment: No deviations or developments
Data storage
National database: Direcció General de Pesca. Generalitat de Catalunya **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
No samples storage
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Editing and imputation methods:** https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality document associated to a dataset**: No **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_ Cat_SciObs water body_Diadromous (scientific)_GE_RWL

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : Mediterranean and Black Sea
Sampling scheme identifier : ANG_Cat_SciObs water body_Diadromous (scientific)_GE_RWL
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2025
Short description (max 100 words): Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
Description of the population
Population targeted: *Anguilla anguilla* **Population sampled**: Glass eel **Stratification**: Te River
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: One sampling point at the river mouth. Sampling monthly from October to March. Total: 6 sampling episodes. For each episode, 50 individuals are preserved alive and transported to the lab to measure total length and weight (±0.01g) the following day. After measuring, the individuals are released into the river. **Is the sampling design compliant with the 4S principle?**: Y **Regional coordination**: Regional coordination **Link to sampling design documentation**: Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**: Sampling allocations are fixed
AR comment: No deviations or developments
Data capture
Means of data capture: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Data capture documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality checks documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
AR comment: No deviations or developments
Data storage
National database: NA The SUDOANG project has compiled various Glass eel . recruitment data generated in the Ter, can be

downloaded in www.sudoang.eu **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
No samples storage
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Editing and imputation methods:** https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality document associated to a dataset**: No **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_ Cat_SciObs water body_Diadromous (scientific)_S_EWL

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : Mediterranean and Black Sea
Sampling scheme identifier : ANG_Cat_SciObs water body_Diadromous (scientific)_S_EWL
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
Description of the population
Population targeted: *Anguilla anguilla* **Population sampled**: Silver eel **Stratification**: Ter River (pilot river basin for eel monitoring)
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: 17 sampling points along the river and main tributaries. European eel sampled by means of electrofishing (two passes). Fish estimated using Seber method for two passes (removal methods) and referred to fish density. Sampling campaign conducted in September-October. Following SUDOANG protocols https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip Silvering stage determined by Durif et al (2003, 2005). **Is the sampling design compliant with the 4S principle?**: Y **Regional coordination**: Regional coordination **Link to sampling design documentation**: Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**: Once per year
AR comment: No deviations or developments
Data capture
Means of data capture: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Data capture documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality checks documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
AR comment: No deviations or developments
Data storage
National database: Direcció General de Pesca. Generalitat de Catalunya and University of Girona.

The SUDOANG project has compiled various eel information from Spain that can be found at: - Electroishing data from the SUDOANG project are hosted at https://bit.ly/3iIgtrT. - Data generated in the Ter silvering stage samplings, can be downloaded from the interactive tool VISUANg (https://sudoang.eu/en/visuang/) **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
No samples storage
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Editing and imputation methods:** https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality document associated to a dataset**: No **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_ Cat_SciObs water body_Diadromous (scientific)_Y_SWL

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : Mediterranean and Black Sea
Sampling scheme identifier : ANG_Cat_SciObs water body_Diadromous (scientific)_Y_SWL
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
Description of the population
Population targeted: *Anguilla anguilla* **Population sampled**: Yellow eel **Stratification**: Ter River (pilot river basin for eel monitoring)
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: 17 sampling points along the river and main tributaries. European eel sampled by means of electrofishing (two passes). Fish estimated using Seber method for two passes (removal methods) and referred to fish density. Sampling campaign conducted in September-October. Following SUDOANG protocols https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip All the eels are measured. **Is the sampling design compliant with the 4S principle?**: Y **Regional coordination**: Regional coordination **Link to sampling design documentation**: Standardised methods for data collection of SUDOANG project are applied https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**: Once per year
AR comment: No deviations or developments
Data capture
Means of data capture: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Data capture documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality checks documentation**: https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip
AR comment: No deviations or developments
Data storage
National database: Direcció General de Pesca. Generalitat de Catalunya and University of Girona.

The SUDOANG project has compiled various eel information from EMU_Cata that can be found at: - Electrofishing data from the SUDOANG project are hosted at https://bit.ly/3iIgtrT. - Data generated in the Ter, can be downloaded from the interactive tool VISUANg (https://sudoang.eu/en/visuang/) **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
No samples storage
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Editing and imputation methods:** https://sudoang.eu/wp-content/uploads/2019/02/Protocols-for-recruitment-silvering-and-otolith-preparation.zip **Quality document associated to a dataset**: No **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_Gali_SciObs water body_Diadromous (commercial)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier: ANG_Gali_SciObs water body_Diadromous (commercial)

Sampling scheme type: Diadromous (commercial)

Observation type: SciObs water body

Time period of validity : 2022-2027

Short description (max 100 words):
The catches are established using auctions data from the different fishermen guilds, which are assigned to a determined river basin.

Description of the population

Population targeted: *Anguilla anguilla*
Population sampled: Catches from EMU_ES_Gali
Stratification: Catches from EMU_ES_Gali

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:
Only one management unit has been defined in the Galicia-Costa RBD, in which recreational fishing activity has been completely forbidden. Yellow and silver eel fishery is performed from boat using a limited number of gears. The boats need a specific license for the fishing gear that will be used in each fishing trip. They might have more than one fishing gear license, but only one of them can be used in each fishing operation. According to the resolution that allows eel fishing in the Arousa, Ferrol and Vigo Rivers ("Resolución do 23 de decembro de 2010, da Dirección Xeral de Ordenación e Xestión dos Recursos Mariños, pola que se autoriza o plan de pesca de anguía para as confrarías de pescadores das rías de Arousa, Ferrol e Vigo" publicado no DOG nº 251 de 31 de diciembre de 2010), the maximum number of sieves is 80, and the fishing period is limited from the 1st of February to the 29th of October. Nowadays, there are 66 boats allowed to fish using the 'butrón' sieve, but only 37 of them are active nowadays. Regarding the 'anguila' sieve, there are 41 boat licenses but this gear has been practically abandoned, and there is only 1 boat currently working with it.
The catches are established using auctions data from the different fishermen guilds, which are assigned to a determined river basin. In the Galician fishermen guilds, yellow and silver eel catches are not split up. The estuaries are considered basins themselves because of their size, and are managed as basin units. In this way, the estuaries listed below contain catches data from the following fishermen guilds:
- Arousa Estuary: Cambados, Carril, and Rianxo fishermen guilds.
- Eo River: Asturians fishermen guilds.
- Ferrol Estuary: Barallobre, Mugardos and Ferrol fishermen guilds.
- Pontevendra Estuary: Pontevedra fishermen guilds.
- Vigo Estuary: Arcade and Redondela fishermen guilds.

Is the sampling design compliant with the 4S principle?: NA
Regional coordination: No
Link to sampling design documentation: NA
Compliance with international recommendations: NA
Link to sampling protocol documentation: NA

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: NA.

Monitoring of sampling progress within the sampling year: NA
AR comment: No deviations or developments
Data capture
Means of data capture: The catches are established using auctions data from the different fishermen guilds, which are assigned to a determined river basin. **Data capture documentation**: Auctions **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: NA **International database**: NA **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
NA
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: N **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_Gali_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier : ANG_Gali_SciObs water body_Diadromous (scientific)

Sampling scheme type: Diadromous (scientific)

Observation type: Self water body

Time period of validity : 2022-2027

Short description (max 100 words):
Electrofishing surveys for the estimation on:

- the standing stock of yellow eel
- the related silver eel escapement

Description of the population

Population targeted: *Anguilla anguilla*
Population sampled: EMU_ES_Gali for eel (*Anguilla anguilla*),
Stratification: Samples are stratified by river in order to obtain a weighted average

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description: Conventional catch-depletion removal methods are used, usually applying Carle-Strub or Seber-LeCren estimators or CPUE formulae in the case of a unique pass. Sampling design intends to cover the whole accessible area, in a kind of systematic sampling.
Is the sampling design compliant with the 4S principle?: NA
Regional coordination: No
Link to sampling design documentation: (Hervella & Caballero, 1999). Inventariación piscícola de los ríos gallegos. 126 pp. ISBN-13: 978-84-453-2458-5, ISBN: 84-453-2458-6
Compliance with international recommendations: Y
Link to sampling protocol documentation: NA

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: NA.
Monitoring of sampling progress within the sampling year: NA

AR comment: No deviations or developments

Data capture

Means of data capture: Field forms
Data capture documentation: Original field forms are digitized and stored as pdf., and data are written and stored in a database application which is capable to analyze data and derive estimations.
Quality checks documentation: NA

AR comment: No deviations or developments

Data storage

National database: NA
International database: NA
Quality checks and data validation documentation: NA

AR comment: No deviations or developments

Sample storage

NA
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: N **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_Murc_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : Spain
Region : EMU_ES_Murc
Sampling scheme identifier : ANG_Murc_SciObs water body_Diadromous (scientific)
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): Sampling aimed at capturing glass eels at one of the points of entry from the Mediterranean Sea to the coastal lake of the Mar Menor
Description of the population
Population targeted: *Anguilla anguilla* **Population sampled**: *Anguilla anguilla* from Es_Murc **Stratification**: Glass eels that enter the Mar Menor come from the Mediterranean Sea
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: The abundance of recruits (glass eel) will be determined by sampling with specific trap gear. The sampling point has been selected based on experience from previous campaigns. The traps are set once a month, for a series of hours on new moon nights **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: The design and sampling protocols were developed as part of a regional agreement **Link to sampling design documentation**: **Compliance with international recommendations**: NA **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**:
AR comment: No deviations or developments
Data capture
Means of data capture: Specific traps for catching glass eels **Data capture documentation**: Excel file **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: NA **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage

NA
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: NA **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_Murc_SciObs water body_Diadromous (commercial)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : Spain
Region : EMU_ES_Murc
Sampling scheme identifier : ANG_Murc_SciObsOnShore_Diadromous (commercial)
Sampling scheme type: Diadromous (commercial)
Observation type: SciObsOnShore
Time period of validity : 2022-2027
Short description (max 100 words): Scientists will carry out at least 3 controls on the commercial fisheries of yellow eel and silver eel from the hypersaline lagoon of the Mar Menor.
Description of the population
Population targeted: *Anguilla anguilla* **Population sampled**: Silver and yellow eels from Mar Menor lagoon **Stratification**: 50 individuals from each class (silver and yellow eels) will be processed
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: During the eel fishing season in the Mar Menor, at least 3 controls will be carried out in which the weight, length and age will be determined. The controls will be carried out in the Lo Pagan Fish Market, where all the commercialization of the eel of the Mar Menor is carried out. 50 individuals from each class will be processed. Weight, length and age will be measured (yellow or silver) **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: The design and sampling protocols were developed as part of a regional agreement **Link to sampling design documentation**: NA **Compliance with international recommendations**: NA **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**:
AR comment: No deviations or developments
Data capture
Means of data capture: NA **Data capture documentation**: Excel file **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: NA **International database**: NA **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
NA

AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: NA **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_Murc_SelfAtShore_Diadromous (commercial)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : Spain
Region : EMU_ES_Murc
Sampling scheme identifier : ANG_Murc_SelfAtShore_Diadromous (commercial)
Sampling scheme type: Diadromous (commercial)
Observation type: SelfAtShore
Time period of validity : 2022-2027
Short description (max 100 words): Yellow and silver eel catches in the Mar Menor lagoon
Description of the population
Population targeted: *Anguilla Anguilla* **Population sampled**: *Anguilla Anguilla* from Mar Menor lagoon **Stratification**: All catches of Silver and yellow eels from Mar Menor lagoon
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: Specific monitoring of the fishery for this species consisting in for every lot of eel sold, the fisherman must fill in a document supervised by the Fishermen's Association which reflects the following data: boat, date, kg catch, type of eel (yellow or silver), gear (paranza or longline) and catch area. This documentation is sent to the Fisheries and Aquaculture Service for processing and supervision. **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: The design and sampling protocols were developed as part of a regional agreement **Link to sampling design documentation**: NA **Compliance with international recommendations**: NA **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**:
AR comment: No deviations or developments
Data capture
Means of data capture: NA **Data capture documentation**: Excel file **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: NA **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
NA
AR comment: No deviations or developments

Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: NA **Validation of the final dataset**: NA
AR comment: No deviations or developments

ANG_Nava_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier: Nava_SciObs water body_Diadromous (scientific)

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity : one year

Short description (max 100 words):
sampling scheme aiming at characterizing the eel population in the Bidasoa River catchment (standing stock of yellow eels and the silver eel escapement), by collecting length and numbers of yellow eels and length, weight, sex ratio and numbers of silver eels.

Description of the population

Population targeted: The scheme covers the Bidasoa River and main tributaries and is carried out yearly in October by electrofishing 11 sites. Only yellow and silver eels are targeted.

Population sampled: Yellow and silver eels in freshwater habitats are targeted.

Stratification: Eels below 30cm are considered "colonising yellow eels" and are only measured. The length/weight relationship for these small eels was established years ago and the formula $y = 2E\text{-}07x^{3,3558}$ (R^2 = 0,9838) is used to estimate the biomass.

Eels of 30cm or bigger are considered potentially migrant and therefore the biometric parameters to determine the silvering stage (as defined by Durif et al. 2003; 2005) are measured for each individual (length, weight, horizontal and vertical eye diameter and pelvic fin length).

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description: The catchment is sampled in 11 sites: 6 sites in the main Bidasoa River and 5 in the most important tributaries (Zia, Onin, Tximista, Latsa and Ezkurra streams). The entire potential distribution of eels in the catchment is covered.

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

Regional coordination: The sampling design and protocols were developed as part of the Eel Management Plan in Navarra, that was included in the Eel Management Plan in Spain.

Link to sampling design documentation: There is no link to a webpage where the documentation can be found. After some preliminary samplings carried out between 2009 and 2011, an internal document was developed in 2012 describing the sampling design and monitoring protocol: Elso J., Álvarez J. y Leunda P.M. (2012) Memoria Anguila 2011: situación de la especie y protocolo de seguimiento. Informe técnico elaborado por G.A.N.A.S.A. para el Gobierno de Navarra.

Compliance with international recommendations: 'Y'.

Link to sampling protocol documentation: There is no link to a webpage where the documentation can be found. An internal document was developed in 2013 describing the sampling protocol and is still in force: Elso J., Álvarez J. y Leunda P.M. (2013) Protocolo de muestreos de anguila en la cuenca del Bidasoa. Informe técnico elaborado por G.A.N.A.S.A. para el Gobierno de Navarra.

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: 'NA'

Monitoring of sampling progress within the sampling year: No sampling allocations are adjusted

AR comment: No deviations or developments

Data capture

Means of data capture: The localities are sampled by electric fishing, applying the method of successive catches without return, carrying out as many passes as necessary to obtain reliable results. In the stations of the main river, a wet surface of not less than 500 m^2 is sampled, delimiting an area of 50x10 meters with stakes in those stations of the main river of greater width. In tributaries, 100 linear meters are sampled. The total area sampled is measured and the effective fishing time is taken to determine the effort made. All the catches of each fishing are kept separate for the subsequent taking of biometric data. These are taken as follows:

- Total length: with a fish measuring board, in millimeters, accuracy of ± 1 mm
- Weight: with a scale, in grams, accurate to ± 1 g
- Ocular diameter: with a digital caliper, in millimeters, precision of ± 0.01 mm. The diameter is measured on both the vertical and horizontal axes.
- Pectoral fin length: with a digital caliper, in millimeters, accurate to ± 0.01 mm. The maximum length of the fin is measured, from insertion to limit

Data capture documentation: There is no link to a webpage where the documentation can be found. An internal document was developed in 2013 describing the protocol for biometric data collection and it is reviewed every year. The last review is: Elso J. (2021) Protocolo para la toma de datos de anguila. Informe técnico elaborado por GAN-NIK para el Gobierno de Navarra.

Quality checks documentation: 'N'

AR comment: No deviations or developments

Data storage

National database: All data gathered are stored in the Ichthyological Registry of Navarra.

International database: 'NA'

Quality checks and data validation documentation: 'N'

AR comment: No deviations or developments

Sample storage

No samples are stored or analysed.

AR comment: No deviations or developments

Data processing

Evaluation of data accuracy (bias and precision): 'N'

Editing and imputation methods: 'N'

Quality document associated to a dataset: 'N'

Validation of the final dataset: 'N'

AR comment: No deviations or developments

ANG_Vale_SciObs water body_Diadromous (commercial)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : Mediterranean and Black Sea

Sampling scheme identifier : ANG_Vale_SciObs water body_Diadromous (commercial)

Sampling scheme type: Diadromous (commercial)

Observation type: SciObs water body

Time period of validity : 2022-2027

Short description (max 100 words):
Catches sampling (GE, Y and S) in EMU_Vale

Description of the population

Population targeted: *Anguilla anguilla*
Population sampled: *Anguilla Anguilla* from EMU_Vale
Stratification: All the eel cathes (GE, Y and S) in EMU_Vale

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:
• Regarding glass eel fishery, actually there are 4 professional associations of glass eel fishermen, all of them in the province of Valencia. In the Albufera, Perelló-Perellonet-Mareny fishing association has the explotation rights. Albufera's fishermen fish in different "Golas", the channels that connect the Albufera lagoon with the sea. In addition, there is another association which practices professional fishery of glass eel in the Molinell river mouth. All of them use fixed places for glass eel fishery and the only rig allowed on them is named "monot".
• The professional yellow/silver eel fishery is practised with a rig named "mornell", which is the only allowed and has standardised measures. These rigs could be placed in fixed or variable sites. There are several difference between province in the eel professional fishery:
O Valencia: There are 4 fishing associations: In the Albufera, -which is a 2100 ha costal lagoon between Turia and Júcar Rivers-, El Palmar, Silla, Catarroja associations exercise their rights to exploit the yellow and silver eel. Eel fishery in the Albufera has its own regulation and two types of fishing are considered: the fixed place fishing (named "redolins") and the traveling fishing. The fishermen community of El Palmar is the fishing organization with the major tradition and number of members, and the only one that is allowed to fish in fixed places in the lagoon. On the other hand, Molinell association operates in the Molinell river, which constitutes the channel that connects Pego-Oliva marsh (an agrarian landscape with a traditional economic activity) with the sea. They also use fixed places for eel fishery.
O Alicante: In this province, professional fishery occurs in 15 fishing preserves located between the El Hondo wetlands (Elche) and the salt flats of Santa Pola. In the fishing preserve of Alicante, a maximum number of fishing rigs (named "mornells") is allowed.
The fishermen guilds and associations give their catches data to the territorial service of each province responsible for the continental fishing. In the case of glass eel, they also report the fishing days.
Regarding length and weight measurements, glass eels and eels are selected at random from:
1) The deliveries made by the glass eel fishermen to the administration, at the Tuéjar fish farm. Data on weight and length of 150 glass eels shall be taken from the deliveries (a part of the catch) made by all professional glass eel fishermen to the administration.
2) Thee catches of the day (or of several days if there were not enough in a single day), at the Palmar fish market. Data on the weight and length of 100 eels will be taken from a sample of the catches made by the professional fishermen of Palmar in the Albufera of Valencia.
Is the sampling design compliant with the 4S principle?: NA

Regional coordination: NA **Link to sampling design documentation**: NA **Compliance with international recommendations**: N. **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**: NA
AR comment: No deviations or developments
Data capture
Means of data capture: NA **Data capture documentation**: NA **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage:
National database: ***NA*** **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: the ices eel working group (WGEEL) reviews the information before incorporating it into its database.
AR comment: No deviations or developments
Sample storage: NA
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): N **Editing and imputation methods: N.** **Quality document associated to a dataset**: **N.** **Validation of the final dataset**: **N.**
AR comment: No deviations or developments

ANG_Vale_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : Mediterranean and Black Sea
Sampling scheme identifier : ANG_Vale_SciObs water body_Diadromous (scientific)
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): Yellow and silver electrofishing eel sampling in the Turia River
Description of the population
Population targeted: *Anguilla anguilla* **Population sampled**: *Anguilla Anguilla* from EMU_Vale **Stratification**: Yellow and silver eel from the the Turia River
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: The abundance of the standing stock (yellow and silver eel) will be determined by electrofishing surveys in 10 river sampling points. Silvering stage determined by Durif et al. (2003; 2005) **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: NA **Link to sampling design documentation**: https://agroambient.gva.es/es/web/medio-natural/planificacion-60934/-/documentos/KuG0baLNcSxQ/folder/128779088?p_auth=BAium0DF **Compliance with international recommendations**: N. **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA **Monitoring of sampling progress within the sampling year**: NA
AR comment: No deviations or developments
Data capture
Means of data capture: NA **Data capture documentation**: NA **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage:
National database: The SUDOANG project has compiled various eel information from EMU_Vale that can be found at https://bit.ly/3iIgtrT. **International database**: The data collected within the National Plan are requested through a data calll by ICES and are hosted in the ICES eel database. In addition, data are published in the annual Spanish Country Report ICES/EIFAC/GFCM WGEEL (https://www.ices.dk/community/groups/Pages/WGEEL.aspx) **Quality checks and data validation documentation**: the ices eel working group (WGEEL) reviews the information before incorporating it into its database.
AR comment: No deviations or developments
Sample storage: NA

AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): N **Editing and imputation methods: N.** **Quality document associated to a dataset**: **N.** **Validation of the final dataset**: **N.**
AR comment: No deviations or developments

Saeatrout_Nava_SciObs water body_Diadromous (recreational)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier: Saeatrout_ Nava_SciObs water body_Diadromous (recreational)

Sampling scheme type: Diadromous (recreational)

Observation type: SciObs water body

Time period of validity : one year

Short description (max 100 words):
sampling scheme aiming at gathering information about the sea trout that are caught by anglers during the angling season, by collecting numbers and biometric data (length, weight, sex and age). Each time an angler catches a sea trout, must call the rangers who collect the data.

Description of the population

Population targeted: The scheme covers all sea trout caught in the Bidasoa River between the sea and the Migratory Fish Control Station (located in Bera, 17.5Km upstream of the sea), the only river stretch where sea trout angling is authorized.

Population sampled: Spring migrating sea trout in their freshwater stage are targeted.

Stratification: Males and females are distinguished (based on morphologic characters) and age (based on scale reading). Angling is only authorized between 1st of May and 31st of July.

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description: All sea trout captured during the angling season. Individual biometric data are taken.

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

Regional coordination: The sampling design and protocols were developed in the 90's and have been reviewed periodically.

Link to sampling design documentation: There is no link to a webpage where the documentation can be found.

Compliance with international recommendations: 'Y'.

Link to sampling protocol documentation: There is no link to a webpage where the documentation can be found.

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: 'NA'

Monitoring of sampling progress within the sampling year: No sampling allocations are adjusted

AR comment: No deviations or developments

Data capture

Means of data capture: When an angler catches a sea trout, must call the rangers who verify that the fish has been legally caught. If so, a legal certificate allowing the animal to be transported is issued. The ranger then collects the following data:

- Fork length: with a fish measuring board, in millimeters, accuracy of ± 5 mm
- Weight: with a scale, in grams, accurate to ± 50 g
- Scale sample: 6–8 scales taken with forceps from the left flank, between the dorsal fin and the lateral line, and stored in a numbered envelope. Used for their age determination

Data capture documentation: There is no link to a webpage where the documentation can be found.

Quality checks documentation: 'N'

AR comment: No deviations or developments
Data storage
National database: All data gathered are stored in the Ichthyological Registry of Navarra. **International database**: 'NA' **Quality checks and data validation documentation**: 'N'
AR comment: No deviations or developments
Sample storage
Scales are read for age determination (river and sea age) and stored in GAN-NIK.
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): 'N' **Editing and imputation methods:** 'N' **Quality document associated to a dataset**: 'N' **Validation of the final dataset**: 'N'
AR comment: No deviations or developments

Saeatrout_Nava_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier: Saeatrout_ Nava_SciObs water body_Diadromous (scientific)
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : one year
Short description (max 100 words): sampling scheme aiming at characterizing the sea trout population migrating upstream in the Bidasoa River, by collecting numbers and biometric data (length, weight, sex and age)
Description of the population
Population targeted: The scheme covers all sea trout that migrate upstream the Bidasoa River through the Migratory Fish Control Station (located in Bera, 17.5Km upstream of the sea). **Population sampled**: Migrating Sea Trout in their freshwater stage are targeted. **Stratification**: Males and females are distinguished (based on morphologic characters) and age (based on scale reading)
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: All sea trout reaching the Migratory Fish Control Station are captured in a fish trap and individual biometric data are taken, before they are released upstream of the fish trap. **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: The sampling design and protocols were developed in the 90's and have been reviewed periodically. **Link to sampling design documentation**: There is no link to a webpage where the documentation can be found. **Compliance with international recommendations**: 'Y'. **Link to sampling protocol documentation**: There is no link to a webpage where the documentation can be found.
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: 'NA' **Monitoring of sampling progress within the sampling year**: No sampling allocations are adjusted
AR comment: No deviations or developments
Data capture
Means of data capture: All sea trout reaching the Migratory Fish Control Station are captured in a fish trap, counted and individual biometric data are taken, before they are released upstream of the fish trap. After anesthetizing the fish, biometric data are taken as follows: • Fork length: with a fish measuring board, in millimeters, accuracy of ± 5 mm • Weight: with a scale, in grams, accurate to ± 50 g • Scale sample: 6–8 scales taken with forceps from the left flank, between the dorsal fin and the lateral line, and stored in a numbered envelope. Used for their age determination **Data capture documentation**: There is no link to a webpage where the documentation can be found. **Quality checks documentation**: 'N'
AR comment: No deviations or developments
Data storage

National database: All data gathered are stored in the Ichthyological Registry of Navarra. **International database**: 'NA' **Quality checks and data validation documentation**: 'N'
AR comment: No deviations or developments
Sample storage
Scales are read for age determination (river and sea age) and stored in GAN-NIK.
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): 'N' **Editing and imputation methods:** 'N' **Quality document associated to a dataset**: 'N' **Validation of the final dataset**: 'N'
AR comment: No deviations or developments

Seatrout_Gali_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : Seatrout_Gali_SciObs water body_Diadromous (scientific)
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): Counting of upstream migrants in a fish trap.
Description of the population
Population targeted: Salmo trutta **Population sampled**: Sea trout run in rivers Landro, Ulla and Lérez. Smolt run in river Ulla **Stratification**: The fraction of individuals that cross the obstruction through the fish trap. Samples are stratified for each river individually.
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: 1) An index of abundance will be derived from density in the lowest reach of rivers, obtained from electrofishing surveys 2) An index of abundance of adults will be estimated from recreational catch and fish trap 3) Biometry of adults will be derived from recreational catch and fish trap samples. **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: No **Link to sampling design documentation**: NA **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA. **Monitoring of sampling progress within the sampling year**: NA
AR comment: No deviations or developments
Data capture
Means of data capture: Field forms **Data capture documentation**: Original field forms are digitized and stored as pdf., and data are written and stored in a database. **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: NA **International database**: NA **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments

Sample storage
NA
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: N **Validation of the final dataset**: NA
AR comment: No deviations or developments

Salmon_Astu_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : Salmon_Astu_SciObs water body_Diadromous (scientific)
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): Salmon sampling int the rivers of Asturias
Description of the population
Population targeted: Salmo salar **Population sampled**: the main rivers available for the species in Asturias **Stratification**: Samples are stratified by river in order to obtain a weighted average.
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: Sampling design intends to cover the whole accessible area, in a kind of systematic sampling. 1) The abundance of parr will be derived from electrofishing surveys in autum 2) Abundance of adults will be estimated from recreational catch and salmons passing in the fish trap traps (sampled every 1-2 days.) 3) Abundance of adults will be estimated from an annual underwater Visual Census: once a year 2 divers enter each river and make an assesment of the population. 4) Biometry of adults will be derived from recreational catch and fish trap samples. **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: No **Link to sampling design documentation**: NA **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA. **Monitoring of sampling progress within the sampling year**: NA
AR comment: No deviations or developments
Data capture
Means of data capture: Field stadia **Data capture documentation**: Original field stadia are digitized and stored as Excel **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: Data is reported to the ministry **International database**: Data is reported to NASCO and ICES if required **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments

Sample storage
NA
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: N **Validation of the final dataset**: NA
AR comment: No deviations or developments

Salmon_Basq_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : Salmon_Basq_SciObs water body_Diadromous (scientific)
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): Salmon sampling int the rivers of the Basque Country with current salmon presence
Description of the population
Population targeted: Salmo salar **Population sampled**: the main rivers available for the species in the Basque Country **Stratification**: Samples are stratified by river in order to obtain a weighted average.
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: Sampling design intends to cover the whole accessible area, in a kind of systematic sampling. 1) The abundance of parr will be derived from electrofishing surveys between March and Mau. Conventional catch-depletion removal methods are used, usually applying Carle-Strub or Seber-LeCren estimators or CPUE formulae in the case of a unique pass. 2) Abundance of adults will be estimated from salmons passing in the fish trap between March and Decemeber 3) Biometry will be derived from electrofishing and fish trap samples. **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: No **Link to sampling design documentation**: NA **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA. **Monitoring of sampling progress within the sampling year**: NA
AR comment: No deviations or developments
Data capture
Means of data capture: Field stadia **Data capture documentation**: Original field stadia are digitized and stored as Excel **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: NA **International database**: Data is reported ICES if required **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage

NA
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: N **Validation of the final dataset**: NA
AR comment: No deviations or developments

Salmon_Cant_SciObs water body_Diadromous (recreational)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : Salmon_Cant_SciObs water body_Diadromous (recreational)
Sampling scheme type: Diadromous (recreational)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): Salmon sampling int the rivers of Cantabria
Description of the population
Population targeted: Salmo salar **Population sampled**: the main rivers available for the species in Cantabria **Stratification**: Samples are stratified by river in order to obtain a weighted average.
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: the catches are reported by the fishermen are weighed and measured **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: No **Link to sampling design documentation**: NA **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA. **Monitoring of sampling progress within the sampling year**: NA
AR comment: No deviations or developments
Data capture
Means of data capture: Field stadia **Data capture documentation**: Original field stadia are digitized and stored as Excel **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: Archivos de la Dirección General de Biodiversidad, Medio Ambiente y Cambio Climático **International database**: NA **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
NA
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: N

Validation of the final dataset: NA
AR comment: No deviations or developments

Salmon_Cant_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : Salmon_Cant_SciObs water body_Diadromous (scientific)
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity : 2022-2027
Short description (max 100 words): Salmon sampling int the rivers of Cantabria
Description of the population
Population targeted: Salmo salar **Population sampled**: the main rivers available for the species in Cantabria **Stratification**: Samples are stratified by river in order to obtain a weighted average.
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: Sampling design intends to cover the whole accessible area, in a kind of systematic sampling. 1) The abundance of parr will be derived from electrofishing surveys in August_september 2) Abundance of adults will be estimated from recreational catch and salmons passing in the fish trap traps (sampled every 1-2 days.) 4) Biometry of adults will be derived from recreational catch **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: No **Link to sampling design documentation**: NA **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA. **Monitoring of sampling progress within the sampling year**: NA
AR comment: No deviations or developments
Data capture
Means of data capture: Field stadia **Data capture documentation**: Original field stadia are digitized and stored as Excel **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: Archivos de la Dirección General de Biodiversidad, Medio Ambiente y Cambio Climático **International database**: NA **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
NA
AR comment: No deviations or developments

Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: N **Validation of the final dataset**: NA
AR comment: No deviations or developments

Salmon_Gali_SciObs water body_Diadromous (recreational)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : Salmon_Gali_SciObs water body_Diadromous (recreational)
Sampling scheme type: Diadromous (recreational)
Observation type: Self water body
Time period of validity : 2022-2027
Short description (max 100 words): Compilation of biometric data of the recreational catch of atlantic salmón (declaration of catches is mandatory in Galicia)
Description of the population
Population targeted: Galicia for atlantic salmon (Salmo salar) in the main rivers were recreational fishing is allowed: Eo, Masma, Mandeo, Ulla and Miño. **Population sampled**: Adult fish legally caught. **Stratification**: Samples are stratified as each river has his own and separate population.
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: Every salmon is measured andweighted. **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: No **Link to sampling design documentation**: NA **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA. **Monitoring of sampling progress within the sampling year**: NA
AR comment: No deviations or developments
Data capture
Means of data capture: Field forms **Data capture documentation**: Original field forms are digitized and stored as pdf., and data are written and stored in a database. **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: NA **International database**: NA **Quality checks and data validation documentation**: NA
AR comment: No deviations or developments
Sample storage
NA
AR comment: No deviations or developments
Data processing

Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: N **Validation of the final dataset**: NA
AR comment: No deviations or developments

Salmon_Gali_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP
Region : North-East Atlantic
Sampling scheme identifier : Salmon_Gali_SciObs water body_Diadromous (scientific)
Sampling scheme type: Diadromous (scientific)
Observation type: Self water body
Time period of validity : 2022-2027
Short description (max 100 words): Salmon sampling int the rivers of Galicia
Description of the population
Population targeted: Salmo salar **Population sampled**: the main rivers available for the species in Galicia Eo, Masma, Ouro, Landro, Mera, Xubia, Mandeo, Anllóns, Ulla, Lérez, Miño (tributaries) **Stratification**: Samples are stratified by river in order to obtain a weighted average.
AR comment: No deviations or developments
Sampling design and protocols
Sampling design description: Sampling design intends to cover the whole accessible area, in a kind of systematic sampling. 1) The abundance of parr will be derived from electrofishing surveys. Conventional catch-depletion removal methods are used, usually applying Carle-Strub or Seber-LeCren estimators or CPUE formulae in the case of a unique pass. 2) The abundance of smolts will be derived from numbers in the fish trap. 3) Abundance of adults will be estimated from recreational catch and salmons passing in the fish trap 4) Biometry of adults will be derived from recreational catch and fish trap samples. **Is the sampling design compliant with the 4S principle?**: NA **Regional coordination**: No **Link to sampling design documentation**: (Hervella & Caballero, 1999). Inventariación piscícola de los ríos gallegos. 126 pp. ISBN-13: 978-84-453-2458-5, ISBN: 84-453-2458-6 **Compliance with international recommendations**: Y **Link to sampling protocol documentation**: NA
AR comment: No deviations or developments
Sampling implementation
Recording of refusal rate: NA. **Monitoring of sampling progress within the sampling year**: NA
AR comment: No deviations or developments
Data capture
Means of data capture: Field forms **Data capture documentation**: Original field forms are digitized and stored as pdf., and data are written and stored in a database application which is capable to analyze data and derive estimations. **Quality checks documentation**: NA
AR comment: No deviations or developments
Data storage
National database: NA **International database**: NA

Quality checks and data validation documentation: NA
AR comment: No deviations or developments
Sample storage
NA
AR comment: No deviations or developments
Data processing
Evaluation of data accuracy (bias and precision): NA **Editing and imputation methods:** NA **Quality document associated to a dataset**: N **Validation of the final dataset**: NA
AR comment: No deviations or developments

Salmon_Nava_SciObs water body_Diadromous (recreational)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier:
Salmon_Nava_SciObs water body_Diadromous (recreational)

Sampling scheme type: Diadromous (recreational)

Observation type: SciObs water body

Time period of validity : one year

Short description (max 100 words):
sampling scheme aiming at gathering information about the adult salmon that are caught by anglers during the angling season, by collecting numbers and biometric data (length, weight, sex, sanitary status and age). Each time an angler catches a salmon, must call the rangers who collect the data.

Description of the population

Population targeted: The scheme covers all adult salmon caught in the Bidasoa River between the sea and the Migratory Fish Control Station (located in Bera, 17.5Km upstream of the sea), the only river stretch where salmon angling is authorized.

Population sampled: Spring migrating adult Salmon in their freshwater stage are targeted.

Stratification: Males and females are distinguished (based on genetic analysis) and 1SW and MSW (based on scale reading). Angling is only authorized between 1st of May and 31st of July.

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description: All salmon captured during the angling season. Individual biometric data are taken.

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

Regional coordination: The sampling design and protocols were developed in the 90's and have been reviewed periodically. Now they are included in the Salmon Management Plan in Navarra and in the NASCO Implementation Plan.

Link to sampling design documentation:
https://nasco.int/wp-content/uploads/2020/11/IP1914rev_EU-Spain_Navarra.pdf
https://www.navarra.es/documents/48192/7222658/Memoria_Salmon_2020.pdf/d15be9f2-9058-f084-e1e3-61e19fdc3e6c?t=1624605547034

Compliance with international recommendations: 'Y'.

Link to sampling protocol documentation: There is no link to a webpage where the documentation can be found. An internal document is developed every year describing the sampling protocol. The last one is: Elso J., (2021) Protocolo de toma de datos y muestras de salmón durante la temporada de pesca. Informe técnico elaborado por GAN-NIK para el Gobierno de Navarra.

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: 'NA'

Monitoring of sampling progress within the sampling year: No sampling allocations are adjusted

AR comment: No deviations or developments

Data capture

Means of data capture: When an angler catches a salmon, must call the rangers who verify that the salmon has been legally caught. If so, a legal certificate allowing the animal to be transported is issued. The ranger then collects the following data:

- Fork length: with a fish measuring board, in millimeters, accuracy of ± 5 mm
- Weight: with a scale, in grams, accurate to ± 50 g
- Maximum height: with a fish measuring board, in millimeters, accuracy of ± 1 mm
- Upper maxilla length: with a caliper, in millimeters, precision of ± 1 mm.
- Tissue sample: small cut from the fin (preferably from the adipose fin), preserved in a numbered Eppendorf tube with 96% alcohol. This sample is used for sex determination.
- Scale sample: 6–8 scales taken with forceps from the left flank, between the dorsal fin and the lateral line, and stored in a numbered envelope. Used for their age determination
- Sanitary status: a visual review of the health status (parasites, wounds, etc.) and the determination of the RVS (Red Vent Syndrome) is carried out
- Fish origin: it is verified if the adipose fin has been cut (fish farm origin) or not (wild origin). In case it is a fish farm salmon, the presence of a CWT (Coded Wire Tag) in the salmon head must be verified (with a CWT hand held detector). If a CWT is detected, the angler has to allow the ranger to cut the head of the salmon, so the CWT can be recovered.

Data capture documentation: There is no link to a webpage where the documentation can be found. An internal document is developed every year describing the sampling protocol. The last one is: Elso J., (2021) Protocolo de toma de datos y muestras de salmón durante la temporada de pesca. Informe técnico elaborado por GAN-NIK para el Gobierno de Navarra.

Quality checks documentation: 'N'

AR comment: No deviations or developments

Data storage

National database: All data gathered are stored in the Salmon Database of Navarra and the Ichthyological Registry of Navarra. A report is published with all the sampling results on a yearly basis and can be downloaded from
https://www.navarra.es/es/medio-ambiente/informacion-tecnica

International database: 'NA'

Quality checks and data validation documentation: 'N'

AR comment: No deviations or developments

Sample storage

Tissue samples are analysed for sex determination and stored in the University of Vigo.
Scales are read for age determination (river and sea age) and stored in GAN-NIK.
Results of both analysis are included in the annual report that can be downloaded from
https://www.navarra.es/es/medio-ambiente/informacion-tecnica

AR comment: No deviations or developments

Data processing

Evaluation of data accuracy (bias and precision): 'N'

Editing and imputation methods: 'N'

Quality document associated to a dataset: 'N'

Validation of the final dataset: 'N'

AR comment: No deviations or developments

Salmon_Nava_SciObs water body_Diadromous (scientific)

The quality report fulfils Article 6(3)(d) of Regulation (EU) 2017/1004. This document is intended to specify data to be collected under Chapter II, point 2 of the EU MAP Delegated Decision annex: Biological data on exploited biological resources caught by Union commercial and recreational fisheries. Use this document to state whether documentation in the data collection process (design, sampling implementation, data capture, data storage, sample storage and data processing) exists and identify where this documentation can be found. Names of sampling schemes and strata shall be identical to those in Tables 2.2, 2.3, 2.4, 2.5, 2.6 and 4.1 of the WP/AR. In case of quality information on scientific surveys, use the survey acronym as a sampling scheme identifier. For mandatory surveys, refer to Table 1 of the EU MAP Implementing Decision annex, see also MasterCodeList 'Mandatory survey at sea'.

MS : ESP

Region : North-East Atlantic

Sampling scheme identifier: Salmon_Nava_SciObs water body_Diadromous (scientific)

Sampling scheme type: Diadromous (scientific)

Observation type: SciObs water body

Time period of validity : one year

Short description (max 100 words):
sampling scheme aiming at characterizing the juvenile salmon population in the Bidasoa River catchment, by collecting length and numbers of salmon parr (0+).

Description of the population

Population targeted:
Parr The scheme covers the Bidasoa River and main tributaries and is carried out yearly in September by electrofishing 31 sites. Only salmon parr are targeted. Most of them are 0+, but a few 1+ are also found.
Adult The scheme covers all adult salmon caught in the Bidasoa River between the sea and the Migratory Fish Control Station (located in Bera, 17.5Km upstream of the sea), the only river stretches where salmon angling is authorized.
Population sampled: Salmon parr and adult (Spring migrating adult Salmon in their freshwater stage are targeted.
) are targeted.
Stratification:
Parr: parr below 130mm in the main river and 110mm in tributaries are considered 0+. Parr longer that those measures are considered 1+. Hatchery origin fish are distinguished from those of wild origin as the former have the adipose fin clipped.
Adult: Males and females are distinguished (based on genetic analysis) and 1SW and MSW (based on scale reading). Angling is only authorized between 1st of May and 31st of July.

AR comment: No deviations or developments

Sampling design and protocols

Sampling design description:
Parr**:** The catchment is sampled in 31 sites: 16 sites in the main Bidasoa River and 15 in the most important tributaries. The entire potential distribution of salmon in the catchment is covered.
Adult: All salmon captured during the angling season. Individual biometric data are taken
Adult: All salmon reaching the Migratory Fish Control Station are captured in a fish trap and individual biometric data are taken, before they are released upstream of the fish trap.
Is the sampling design compliant with the 4S principle?: NA
Regional coordination: The sampling design and protocols were developed in the 90's and have been reviewed periodically. Now they are included in the Salmon Management Plan in Navarra and in the NASCO Implementation Plan.
Link to sampling design documentation:
https://nasco.int/wp-content/uploads/2020/11/IP1914rev_EU-Spain_Navarra.pdf
https://www.navarra.es/documents/48192/7222658/Memoria_Salmon_2020.pdf/d15be9f2-9058-f084-e1e3-61e19fdc3e6c?t=1624605547034
Compliance with international recommendations: 'Y'.
Link to sampling protocol documentation: There is no link to a webpage where the documentation can be found. An internal document is developed every year describing the sampling protocol. The last one is: Elso J.,

(2021) Protocolo de muestreo de juveniles de salmón. Informe técnico elaborado por GAN-NIK para el Gobierno de Navarra.

AR comment: No deviations or developments

Sampling implementation

Recording of refusal rate: 'NA'

Monitoring of sampling progress within the sampling year: No sampling allocations are adjusted

AR comment: No deviations or developments

Data capture

Means of data capture:

Parr: The localities are sampled by electric fishing, applying the method of successive catches without return, carrying out as many passes as necessary to obtain reliable results. In eight of the sampling sites of the main channel, semi-quantitative samplings (5 'of effective fishing) are carried out to calculate the abundance index and in the other eight and in the two main tributaries (Tximista and Ezkurra) a complete quantitative inventory is also carried out, to estimate population density. Only quantitative inventories are carried out at the other 13 sampling points of the tributaries. In the stations of the main river, a wet surface of not less than 500 m^2 is sampled, delimiting an area of 50x10 meters with stakes in those stations of the main river of greater width. In tributaries, 140 linear meters are sampled. The total area sampled is measured and the fishing time is taken to determine the effort made. All the catches of each fishing are kept separate for the subsequent taking of biometric data. Fork length is measured with a fish measuring board (in millimeters, accuracy of ± 1 mm) for all individuales and it is checked if the adipose fin is cut, to verify the origin of the fish (hatchery or wild)

Adult: When an angler catches a salmon, must call the rangers who verify that the salmon has been legally caught. If so, a legal certificate allowing the animal to be transported is issued. The ranger then collects the following data:

- Fork length: with a fish measuring board, in millimeters, accuracy of ± 5 mm
- Weight: with a scale, in grams, accurate to ± 50 g
- Maximum height: with a fish measuring board, in millimeters, accuracy of ± 1 mm
- Upper maxilla length: with a caliper, in millimeters, precision of ± 1 mm.
- Tissue sample: small cut from the fin (preferably from the adipose fin), preserved in a numbered Eppendorf tube with 96% alcohol. This sample is used for sex determination.
- Scale sample: 6–8 scales taken with forceps from the left flank, between the dorsal fin and the lateral line, and stored in a numbered envelope. Used for their age determination
- Sanitary status: a visual review of the health status (parasites, wounds, etc.) and the determination of the RVS (Red Vent Syndrome) is carried out
- Fish origin: it is verified if the adipose fin has been cut (fish farm origin) or not (wild origin). In case it is a fish farm salmon, the presence of a CWT (Coded Wire Tag) in the salmon head must be verified (with a CWT hand held detector). If a CWT is detected, the angler has to allow the ranger to cut the head of the salmon, so the CWT can be recovered.

Data capture documentation: There is no link to a webpage where the documentation can be found. An internal document was developed in 2013 describing the protocol for biometric data collection and it is reviewed every year. The last review is: Elso J. (2021) Protocolo para la toma de datos de juveniles de salmón. Informe técnico elaborado por GAN-NIK para el Gobierno de Navarra.

Quality checks documentation: 'N'

AR comment: No deviations or developments

Data storage

National database: All data gathered are stored in the Ichthyological Registry of Navarra. A report is published with all the sampling results on a yearly basis and can be downloaded from https://www.navarra.es/es/medio-ambiente/informacion-tecnica

International database: 'NA'

Quality checks and data validation documentation: 'N'

AR comment: No deviations or developments

Sample storage

Parr: No samples are stored or analysed.

Adult: Tissue samples are analysed for sex determination and stored in the University of Vigo.

Scales are read for age determination (river and sea age) and stored in GAN-NIK.

Results of both analysis are included in the annual report that can be downloaded from https://www.navarra.es/es/medio-ambiente/informacion-tecnica

AR comment: No deviations or developments

Data processing
Evaluation of data accuracy (bias and precision): 'N' **Editing and imputation methods:** 'N' **Quality document associated to a dataset**: 'N' **Validation of the final dataset**: 'N'
AR comment: No deviations or developments

ANNEX 1.2 - Quality report for socioeconomic data sampling scheme

Fisheries. Probability sample survey

The quality report fulfils Article 6 (3) (d) of the Regulation (EU) 2017/1004. This document is intended to specify data to be collected under chapter II, points 3, 5, 6, and 7 of the Delegated Decision annex: Socioeconomic data on fisheries, aquaculture and any complementary data collection of fishing activity and fish processing. Use this document to describe quality aspects of the data collection process (design, sampling implementation, data capture, data storage and data processing etc.). The annex should be filled for each sampling scheme. Where applicable, use the handbook on sampling design (Deliverable 2.1 from MARE/2016/22 SECFISH study), available on the DCF website.

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design. Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.
Sector name(s): Fisheries
Sampling scheme: Probability sample survey
Variables: All variables in tables 7 and 9
Supra region(s): All Supra regions
Survey planning
The statistical unit or observation unit is each of the vessels included in the CFP (Operative Fishing Fleet Census, in Spanish), which can perform marine fishing, classified in group 03.11 of the National Activities Classification (CNAE-2009). **The reporting unit** is the vessel's owner. **The sampling unit** is each CFP vessel with activity during the referred year. **The analysis unit**, or economic activity unit is the vessel, therefore, it coincides with the observation unit.
AR comment: No deviations or developments
Survey design and strategy
Stratified random sampling. The main variable of this survey is the economic profitability of the ship, and the auxiliary variable to be used to stratify is the GT, a variable of which the population distribution is known. **Stratification:** Survey population was divided into strata, according to the auxiliary variable GT, with the aim of obtaining groups on vessels as homogeneous as possible within stratum GT and with the greatest possible heterogeneity among the different strata, in relation to the profitability of the vessels. Strata were defined according to statistic, biological (similarity in the fishing grounds' characteristics), and technical (type of fishing methods utilised and vessel length). In addition to the above mentioned criteria, stratification of the population has to meet the levels of disaggregation required by Community rules, resulting from Commission Delegated Decision (EU) 2019/910. Strata cannot contain less than 10 elements: strata not meeting this condition are grouped with others. **Sample size:** with optimum allocation. Total sample size is determined aiming to estimate the median GT of the population with an expected error of 5%, that is, a 95% level of confidence. **Sample selection:** In the population database, vessel data will appear together with the vessel's owner data. By selecting the statistical units, reporting units of the survey are perfectly demarcated. The various ships in the population are grouped according to the stratum to which they belong, and in each of these groups, membership or not of each of the vessels to the stratum will be randomly allocated. The result is a set of random and mutually independent subsamples.

The size of each of these subsamples will be previously determined by the (previously set) expected error level.

AR comment: No deviations or developments

Estimation design

Method to calculate the population estimate from the sample .

The population under study has been divided into strata, for the purposes of sample design, based on the auxiliary variable GT, with the aim of achieving groups of vessels with a GT that is as homogeneous within the stratum and with the greatest possible heterogeneity. between the different strata, in relation to the economic profitability of the vessels. All this so that the representativeness of the vessels, within each stratum, is as high as possible. In this way, when applying the corresponding sample design, samples will be obtained that will have the least possible number of units to be sampled.

Sample size.

- Total sample size with optimal allocation.

The total sample size to estimate the mean GT of the population with an expected error of 5% to 95% confidence level, has been calculated assuming that an optimal allocation is going to be made and that a normal population is considered.

The formula used to calculate the sample size n is the following:

$$n = \frac{\left(\sum_{h=1}^{h=L} N_h S_h\right)^2}{\frac{N^2 e^2 \overline{X}^2}{z^2} + \sum_{h=1}^{h=L} N_h S_h^2} \qquad (1)$$

Where: h is the number of strata ranging from 1 to L (maximum number of strata), Nh the size of stratum h, N the size of the population, Sh the standard deviation of stratum h, the mean GT of the population, and the error of the estimate and z the standardized variable for the chosen confidence level.

- Assignment of the sample by strata.

The allocation of the sample to each of the strata is calculated by applying a double allocation or distribution of the sample (allocation of commitment), considering the estimators of the totals of the variable Tonnage (GT) and the proportionality of vessels within each stratum .
The commitment of the sample to the strata is carried out using the following formulas:

<u>Optimal Attachment</u>

$$nOP_h = n \frac{N_h S_h}{\sum_{h=1}^{h=L} N_h S_h} \quad (2)$$

Being: n, h, Nh and Sh the same statistics as in (1).

<u>Proportional allocation</u>

$$nP_h = n \frac{N_h}{\sum_{h=1}^{h=L} N_h} \quad (3)$$

Being: n, h and Nh the same statistics as in (1).

The Compromise Allocation between minimum (optimal) and proportional variance will be weighted ¾, ¼ for each of the allocations.

$$n_h = nOP_h * 3/4 + nP_h * 1/4 \quad (4)$$

Sample selection

- Determination of the reporting units.

The reporting unit can articulate around the ship, but doing so would mean losing the necessary information in those in which a shipowner has more than one ship, since it can report on all the ships it controls, without additional effort.
For these reasons, it is proposed to adopt the shipowner as the reporting unit, who will be questioned about all the vessels it manages, although it must be taken into account that these vessels may not belong to the sample and will therefore not be taken into account in the elevations. .
In the population database the data of the vessels will appear together with the data of the owners thereof. When selecting the statistical units, the reporting units of the survey are perfectly delimited.

- General description of the sample selection procedure.

As the ship is the sampling unit, it is necessary that the selection of any unit within the sample is random within the stratum to which it belongs.
The different vessels in the population will be grouped according to the stratum to which they belong, and in each of these groups the membership or not of each of the vessels in the stratum sample will be randomly drawn. The result is a set of random and independent subsamples.
The size of each of the aforementioned subsamples will be previously determined by the level of error that is set.

Estimators

The population estimators of the total of the main variable and the rest of the variables of interest will be estimated. The variables of interest will be estimated using stratified sampling procedures.
From the data contained in the questionnaire, the variables whose population values are of interest will be constructed.
The relevant formulas for stratified random sampling are:

- Estimation of population mean : $\hat{\bar{X}}_S$

$$\hat{\bar{X}}_S = \sum_{h=1}^{h=L} W_h \bar{x}_h \qquad (3)$$

Where: $\bar{x}_h$ the mean of the variable observed in stratum h and $W_h = N_h / N$ the weight of stratum h.

- Estimated variance of the population mean $V(\hat{\bar{X}}_S)$:

$$V\left(\hat{\bar{X}}_S\right) = \sum_{h=1}^{h=L} W_h^2 \frac{N_h - n_h}{N_h} \frac{S_h^2}{n_h} \qquad (4)$$

Where: Nh is the population size of the stratum, nh the size of the sample in stratum h.

- Estimate of the total population, $\hat{X}_S$:

$$\hat{X}_S = \sum_{h=1}^{L} N_h \bar{x}_h \quad (5)$$

Where: Nh is the population size of the stratum and $\bar{x}_h$ the mean of the variable observed in each stratum.

- Estimated variance of the total population, $V(\hat{X}_S)$:

$$V(\hat{X}_S) = \sum_{h=1}^{h=L} N_h^2 \frac{N_h - n_h}{N_h} \frac{S_h^2}{n_h} \quad (6)$$

All parameters match those described in expression (4).

Describe method of calculating derived data: e.g. imputed values.

The different economic variables requested from the informant are considered of two types; mandatory response and non-mandatory response. Those with a mandatory response are compulsorily collected, and those with a non-mandatory response can have a value or be zero in case there is no value. Therefore, no values are imputed.

Describe treatment of nonresponse.

Treatment of total lack of response and treatment of stratum change

The lack of response, generated by some heads of the sampling units, will imply an increase in the level of error. A different case is the location of the units that have been decommissioned or are no longer in operation, these cases will imply a variation in the framework of the initial population.

Total lack of response and treatment of stratum change will be treated as follows:

The basic estimator (unbiased estimator of expansion in stratified sampling)

being: $$\hat{X} = \sum_h \frac{N_h}{n_h} \sum_i x_i$$

Nh: Total number of units in the directory in stratum h

nh: Number of units selected for the sample in stratum h

Xi: Value of the observed variable X in unit i of stratum h

It is corrected from the corrections made in the elevation factor due to the various types of incidents that arise during field work: total non-response, change of stratum, etc.

Thus, the final elevation factor will be:

If there is no change in stratum: $\frac{N_h}{n_h}$

If there is a change of stratum: $\frac{\hat{N}^*_h}{n^*_h}$

being:

n^*_h : Number of units of the effective sample that has not changed stratum

$\hat{N}^*_h$: Number of units in the directory in stratum h obtained by deflating as a function of losses and changes in stratum

$$\hat{N}^*_h = N_h \left(1 - \frac{b_h}{n_h}\right) - \sum_{h \neq k} \frac{N_h}{n_h} n^k_h$$

b_h : Number of units that are low in the sample (sample incidence of frame correction)

n^k_h : Number of units selected in stratum h and that really belong to stratum k

Final expression of the estimator:

$$\hat{X} = \sum_h \left\{ \sum_{i=1}^{n^*_h} \frac{\hat{N}^*_h}{n^*_h} x_i + \sum_{k \neq h} \frac{N_k}{n_k} \sum_{i=1}^{n^h_k} x_i \right\}$$

The first addend represents the contribution of the units that have not changed stratum.
The second addend represents the contribution of the units selected in stratum k and that really belong to h.

Treatment of incidents

In the event that an incident occurs once the questionnaires have been collected, they will be treated as follows.

First, the different situations are defined:

E : RESPONDENTS, sample units located and surveyed, are considered Surveyable.

B : LOW, units which are on leave during the reference year and it is not expected that they will be active again, therefore they will be considered Non-surveyable.

I : INACTIVE, those units that have not had activity during the study period are considered, but it is known that in future periods they will be able to do so. They are considered to be surveyable with incidents.

N : NEGATIVE, those sample units that have not wanted to answer the survey or that after several attempts to carry out the survey have been unsuccessful. They are considered to be surveyable with incidents.

IL : ILOCALIZABLE, sample units that could not be surveyed because they were not located. They will be considered Surveyable with incidents.

AS : ABSENT, sample units that are absent in all data collections. They will be considered pollstable with incidents.

F : DECEASED, those sample units located but deceased. They are considered not surveyable.

J : RETIRED, retired sample units, will be considered not surveyable.

IN : DISABLED, are the sample units that during the period under study have been unable to carry out their activity. Each particular case will be studied to determine whether in successive periods the sample unit will be able to carry out the activity or will have to be terminated. In the first case, they will be considered Surveyable with incidents.

In the case of the sample units considered Not to be surveyed, the reason for not having their information for the design of future surveys will be noted and they will affect the survey frame by reducing it by the corresponding percentage.

It will be necessary to document each of the situations described above with confirmation from the interviewer.

The theoretical design of the sampling work is developed in the published methodology
https://www.mapa.gob.es/es/estadistica/temas/estadisticas-pesqueras/pesca-maritima/encuesta-economica-pesca-maritima/default.aspx

AR comment:
The sample has been increased to improve the representativeness of the data and maintain the reliability of the results and that these continue to be robust in the face of non-response from some elements of the sample.

Error checks

VALIDATION METHOD

Three types of validations are carried out:
1. Initial Validation:
All questionnaires are checked and their information is recorded. This is done visually by comparing the physical questionnaire with the electronic one.

2. Logical Validation:
It is carried out by the application by carrying out a series of controls with the recorded data, applying controls on the recorded information, checking if the data is recorded as it is mandatory and if it is in accordance with the rest of the information recorded for that ship.
Once the data has been analyzed and the errors corrected or the data confirmed with the interviewer and the owner thereof, these data are accepted as correct and the results are calculated.

3. Validation of results:
Once the results are obtained, they are exported to Excel and checks are made of whether the operations to calculate the indicators are well done and whether the results are consistent with those obtained in other years.

Described in published methodology
https://www.mapa.gob.es/es/estadistica/temas/estadisticas-pesqueras/pesca-maritima/encuesta-economica-pesca-maritima/default.aspx.

AR comment: No deviations or developments

Data storage and documentation

INFORMATION STORAGE METHOD

The data is stored in databases and the documentation and publication of results can be seen on the website of the Ministry.
The information on the variables collected, as well as the economic indicators produced are stored in databases for each of the vessels selected in the sample.
This information is protected by statistical secrecy so that the data is always used in an aggregate way so as not to be able to identify the holders.

The data is stored in databases and the documentation and publication of results can be seen on the website of the Ministry.
https://www.mapa.gob.es/es/estadistica/temas/estadisticas-pesqueras/pesca-maritima/encuesta-economica-pesca-maritima/default.aspx

AR comment: No deviations or developments

Revision

The methodology is reviewed annually and modifications are incorporated in order to be applied in the subsequent year's collection.
The population is adjusted annually to the stratification defined in the methodology, following the indications of the regulations and decisions of the EU.

AR comment: No deviations or developments

Confidentiality

The confidentiality of the information is subject to the Data Protection regulations and the Law of the Public Statistical Function of Spanish legislation.
In accordance with confidentiality legislation, data will not be published or shared if they identify the owner of the same.

AR comment: No deviations or developments

ANNEX 1.2 - Quality report for socioeconomic data sampling scheme

Fisheries. Census

Survey specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Fisheries
Sampling scheme: Census
Variables: All variables in tables 7 and 9
Supra region(s): All Supra regions
Survey planning
Provide a short description of the population the sampling scheme applies to; e.g. '*less active vessels using passive gears*'. This Data Quality report is still in progress
AR comment: No deviations or developments.
Survey design and strategy N/A

List data sources; e.g. interviews, registers, log books, sales notes, VMS, financial accounts etc. Describe how the sample sizes were determined. Describe survey methods and distribution; e.g. questionnaire forms by post, by email, on website, by phone etc. access to other datasets etc. Describe the role of auxiliary information, if any, in the strategy: e.g. for validation, cross referencing, fall back data source etc.
AR comment: No deviations or developments
Estimation design
N/A Describe method of calculating population estimate from sample. Describe method of calculating derived data: e.g. imputed values. Describe treatment of nonresponse.
AR comment: No deviations or developments
Error checks
N/A Describe potential errors and how and where in the process these are detected, avoided or eliminated e.g., data; duplication, double counting, respondent error, upload error, processing error etc.
AR comment: No deviations or developments
Data storage and documentation
N/A Describe how the data is stored. Provide link to webpage where additional methodological documentation can be found, if any.
AR comment: No deviations or developments
Revision
N/A Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment, per variable etc.

AR comment: No deviations or developments
Confidentiality
N/A Are procedures for confidential data handling in place and documented? Are protocols to enforce confidentiality between DCF partners in place and documented? Are protocols to enforce confidentiality with external users in place and documented? Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.
AR comment: No deviations or developments.

ANNEX 1.2 - Quality report for socioeconomic data sampling scheme

Aquaculture. Stratified random sampling

The quality report fulfils Article 6 (3) (d) of the Regulation (EU) 2017/1004. This document is intended to specify data to be collected under chapter II, points 3, 5, 6, and 7 of the Delegated Decision annex: Socioeconomic data on fisheries, aquaculture and any complementary data collection of fishing activity and fish processing. Use this document to describe quality aspects of the data collection process (design, sampling implementation, data capture, data storage and data processing etc.). The annex should be filled for each sampling scheme. Where applicable, use the handbook on sampling design (Deliverable 2.1 from MARE/2016/22 SECFISH study), available on the DCF website.

Survey Specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design. Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.
Sector name(s): Aquaculture
Sampling scheme: Probability Sample Survey
Variables: All variables in tables 9 and 10
Supra region(s):
Survey planning
The statistical unit or observation unit is each of the establishments authorised to perform aquaculture activities, as described in group 03.2 of CNAE-2009. **The reporting unit** is the person who, owning the company to which the establishment belongs, or having the power and ability to respond, can be asked the questions contained in the corresponding questionnaire, related to the observation unit. **Sample units** are the establishments performing aquaculture activities which in the reference year were authorised to do so. **The analysis unit**, or economic activity unit is the establishment. It is the part of the company which undertakes its activity in

a given geographical situation. Hence, in most cases it coincides with the observation unit.
When a company of the same owner and the same main activity has several establishments of aquaculture and data collected in the questionnaire are not disaggregated by each of the establishment, an proportional estimation of the corresponding fraction for each establishment is made.

AR comment: No deviations or developments

Survey design and strategy

The methodology used for data collection is mixed. One part of the population is surveyed exhaustively (with a census) and the other part is surveyed with stratified random sampling.
Stratified random sampling. The main variable of this survey is the result before taxes. However, the main variable will be determined at the end of the survey. This is why, in order to determine the simple size, it is necessary to have an auxiliary variable that is both previously known and correlated to the main variable. The effectively used capacity of the establishment will be the auxiliary variable, referred to as the size of the existing facilities in the establishment used to accommodate the species during the different phases or processes of aquaculture, which are effectively being used to this end.
The population to be sampled has been divided into strata, aiming to obtain groups of establishments with characteristics as homogeneous as possible within the stratum and with the greatest possible heterogeneity among the different strata.
Another criterion when defining the strata has been to obtain a number of them which can be handled, ensuring that each either includes a significant number of establishments or it represents a given species or zone.
In addition to the above mentioned criteria, stratification of the population has to meet the levels of disaggregation required by Community rules, resulting from Commission Delegated Decision (EU) 2019/910.
Stratification was made based on the establishments' characteristics: type of aquaculture according to water origin, type of aquaculture facilities (ground, in natural spaces. Horizontal culture, cages), and main species rose.
Strata have been surveyed by census or by sampling according to the following criteria:
-Strata including less than 20 establishments for each main species cultivated: exhaustive survey.
-Strata including 20 or more establishments and homogeneous characteristics: sampled and then extrapolated to obtain data for the population.
In this second group we must consider that sample size is calculated according to the auxiliary variable, the capacity effectively used by the establishment, and that, when variability within the stratum is high, it may be the case that sample size is the same as the population size for a particular stratum.
Sample size: with optimum allocation. Total sample size is determined aiming to estimate the economics results of the population with an expected error of 5%, that is, a 95% level of confidence.
Sample selection: In the population database, data from the aquaculture establishments will appear together with the corresponding owner data, for both the exhaustive survey and sampling. By selecting the statistical units, reporting units of the survey are perfectly demarcated.
In the exhaustive survey, each statistical unit will represent one unit in the population as a whole.
In sampling, the units will represent the corresponding population. Therefore, it will be necessary to select sampling units randomly.
For sampling, the population of different groups will be grouped according to the stratum to which they belong, and in each of these groups sampling will be made randomly obtaining as many random and mutually independent subsamples as there are strata.
The size of each of these subsamples will be previously determined by the (previously set) expected error level

AR comment: No deviations or developments

Estimation design

Type of sampling. Stratification.
The strata have been investigated on a census or sample basis, according to the following criteria:
- Those strata that due to their low number of establishments (less than 20), for each main cultivated species, all establishments of the stratum are investigated (exhaustive investigation).
- Those strata that have a high number of establishments, 20 or more, and, usually, homogeneous characteristics, are investigated by sampling the establishments of the stratum, with their subsequent elevation to obtain results from the population.
In this second group, it must be taken into account that the sample size is calculated using the auxiliary variable, used capacity of the establishment and that, when its variability within the stratum is high, it may be the case that the sample size is equal to the population size, in that stratum.
Sample size.

- Total sample size with optimal allocation

The total size of the sample to estimate the Economic Result of the population with an expected error of 5% to 95% confidence level, has been calculated assuming that an optimal allocation will be made.

The formula used to calculate the sample size n is the following:

$$n = \frac{\left(\sum_{h=1}^{h=L} N_h S_h\right)^2}{\frac{N^2 e^2 \overline{X}^2}{z^2} + \sum_{h=1}^{h=L} N_h S_h^2} \quad (1)$$

Where: h is the number of strata ranging from 1 to L (maximum number of strata), Nh the size of stratum h, N the size of the population, Sh the standard deviation of stratum h, mean capacity of the population, and the error of the estimate and z the standardized variable for the chosen confidence level.

- Assignment of the sample by strata

The optimal allocation of the sample to the strata is carried out using the following formula:

$$n = \frac{N_h S_h}{\sum_{h=1}^{h=L} N_h S_h} \quad (2)$$

Being: n, h, Nh and Sh the same statistics as in (1)

Sample selection

- Determination of the reporting units

An informant unit is considered to be that natural person, who, being the owner of the company to which the establishment belongs, or having the power and capacity to respond, can be asked the questions collected in the corresponding questionnaires, in relation to the observation unit. Therefore, the reporting unit is related to the statistical unit of the survey, aquaculture establishment.

In the population database, the data of the aquaculture establishments will appear together with the data of the owners of the companies of these establishments, both for exhaustive research and sampling.

For these reasons, when selecting the statistical units, the reporting units of the survey are perfectly delimited.

- General description of the sample selection procedure

The data collection of this survey is carried out in two ways, one exhaustive and the other by stratified random sampling.

In the exhaustive collection part, each statistical unit will represent one unit in the total population.

The units of the sample collection part will represent their corresponding population, for this it will be necessary that the selection of the sample units is made randomly.

For sampling, the population of the different groups will be grouped by strata and the necessary sample will be drawn randomly from them, obtaining as many independent subsamples as strata.

The size of each subsample is predetermined by the level of error that is set.

Estimators

For the part of the study in which the collection is to be carried out exhaustively, there is an imputation method for cases of non-response to mandatory questions within partially answered questionnaires. For these questionnaires, after trying to collect them by all possible means, revisiting the holders, telephone contact, etc., the unanswered units will be analyzed and if any common characteristic is found with the units that do have a response, then the value will be imputed taking this into account. If no common characteristic is found, the missing data will be imputed with the mean value of that question for the units of the same stratum.

The relevant formulas for estimating the population results corresponding to stratified random sampling are:

• Estimation of the population mean,: $\hat{\overline{X}}_S$

$$\hat{\overline{X}}_S = \sum_{h=1}^{h=L} W_h \overline{x}_h \quad (3)$$

Where: $\overline{x}_h$ the mean of the variable observed in stratum h and $W_h = N_h / N$ the weight of stratum h.

• Estimated variance of the population mean, $V(\hat{\bar{X}}_S)$

$$V\left(\hat{\bar{X}}_S\right) = \sum_{h=1}^{h=L} W_h^2 \frac{N_h - n_h}{N_h} \frac{S_h^2}{n_h} \quad (4)$$

Where: Nh is the population size of the stratum, nh the size of the sample in stratum h.

Estimation of the total population,: $\hat{X}_S$

$$\hat{X}_S = \sum_{h=1}^{L} N_h \bar{x}_h \quad (5)$$

Where: Nh is the population size of the stratum and $\bar{x}_h$ the mean of the variable observed in each stratum.

• Estimated variance of the total population,: $V(\hat{X}_S)$

$$V(\hat{X}_S) = \sum_{h=1}^{h=L} N_h^2 \frac{N_h - n_h}{N_h} \frac{S_h^2}{n_h} \quad (6)$$

All parameters match those described in expression (4).

Describe method of calculating derived data: e.g. imputed values.

The different economic variables requested from the informant are considered of two types; mandatory response and non-mandatory response. Those with a mandatory response are compulsorily collected, and those with a non-mandatory response can have a value or be zero in case there is no value. Therefore, no values are imputed.

Describe treatment of nonresponse.

Treatment of total lack of response and treatment of stratum change

The lack of response, generated by some heads of the sampling units, will imply an increase in the level of error. A different case is the location of the units that have been decommissioned or are no longer in operation, these cases will imply a variation in the framework of the initial population.

Total lack of response and treatment of stratum change will be treated as follows:

The basic estimator (unbiased estimator of expansion in stratified sampling)

being: $$\hat{X} = \sum_h \frac{N_h}{n_h} \sum_i x_i$$

Nh: Total number of units in the directory in stratum h

nh: Number of units selected for the sample in stratum h

Xi: Value of the observed variable X in unit i of stratum h

It is corrected from the corrections made in the elevation factor due to the various types of incidents that arise during field work: total non-response, change of stratum, etc.

Thus, the final elevation factor will be:

If there is no change in stratum: $\frac{N_h}{n_h}$

If there is a change of stratum: $\frac{\hat{N}_h^*}{n_h^*}$

being:

n_h^* : Number of units of the effective sample that has not changed stratum

$\hat{N}_h^*$: Number of units in the directory in stratum h obtained by deflating as a function of losses and changes in stratum

$$\hat{N}_h^* = N_h \left(1 - \frac{b_h}{n_h}\right) - \sum_{h \neq k} \frac{N_h}{n_h} n_h^k$$

b_h

: Number of units that are low in the sample (sample incidence of frame correction)

n_h^k : Number of units selected in stratum h and that really belong to stratum k

Final expression of the estimator:

$$\hat{X} = \sum_h \left\{ \sum_{i=1}^{n_h^*} \frac{\hat{N}_h^*}{n_h^*} x_i + \sum_{k \neq h} \frac{N_k}{n_k} \sum_{i=1}^{n_k^h} x_i \right\}$$

The first addend represents the contribution of the units that have not changed stratum.
The second addend represents the contribution of the units selected in stratum k and that really belong to h.

The theoretical design of the sampling work is developed in the published methodology https://www.mapa.gob.es/es/estadistica/temas/estadisticas-pesqueras/acuicultura/encuesta-economica-acuicultura/default.aspx.

AR comment: No deviations or developments

Error checks

VALIDATION METHOD

Three types of validations are carried out:
1. Initial Validation:
All questionnaires are checked and their information is recorded. This is done visually by comparing the physical questionnaire with the electronic one.

2. Logical Validation:
It is carried out by the application by carrying out a series of controls with the recorded data, applying controls on the recorded information, checking if the data is recorded as it is mandatory and if it is in accordance with the rest of the information recorded.
Once the data has been analyzed and the errors corrected or the data confirmed with the interviewer and the owner thereof, these data are accepted as correct and the results are calculated.

3. Validation of results:
Once the results are obtained, they are exported to Excel and checks are made of whether the operations to calculate the indicators are well done and whether the results are consistent with those obtained in other years.

A control of non-sampling errors is carried out throughout the statistical process.
The survey framework is formed from the Directory of Aquaculture Establishments. This directory is made up of all the establishments authorized to carry out aquaculture activities. The directory is updated annually by the Survey of Aquaculture Establishments, either by means of the records that authorize the activity, or by the fieldwork of said survey itself. The population object of study in the Economic Survey of Aquaculture is obtained from the analysis of said framework and is made up of the set of farms with cultivation that, in the reference period, had authorization to develop aquaculture activity.
The interviewers go out into the field with a copy of the questionnaires and their corresponding roadmaps. The roadmaps are a fundamental instrument to keep track of the situation of the surveys and the possible incidents produced. By completing them, the validity of the study framework is checked and the number of questionnaires collected is validated.
The data collection, at the beginning, is used to analyze the possible errors in the completion of questionnaires and to correct them in the successive field trips of the interviewers.
The lack of response, generated by some managers of establishments considered as sample data, implies an increase in the level of error. A different case is the location of establishments that have been canceled or are no longer in operation; These cases imply a change in their situation within the initial population and a change, therefore, in the elevation coefficient.
Total non-response and treatment of stratum change are addressed by estimating stratum values.
The data collected is purified by correcting possible inconsistencies in them. Once they are received and after they have been recorded, it is again observed if there are possible deviations of values at a global level and any inconsistencies are corrected.

Described in published methodology

https://www.mapa.gob.es/es/estadistica/temas/estadisticas-pesqueras/acuicultura/encuesta-economica-acuicultura/default.aspx

AR comment: No deviations or developments

Data storage and documentation

INFORMATION STORAGE METHOD

The data is stored in databases and the documentation and publication of results can be seen on the website of the Ministry.
The information on the variables collected, as well as the economic indicators produced are stored in databases for each of the vessels selected in the sample.
This information is protected by statistical secrecy so that the data is always used in an aggregate way so as not to be able to identify the holders

The data is stored in databases and the documentation and publication of results can be seen on the website of the Ministry.
https://www.mapa.gob.es/es/estadistica/temas/estadisticas-pesqueras/acuicultura/encuesta-economica-acuicultura/default.aspx

AR comment: No deviations or developments

Revision

The methodology is reviewed annually and modifications are incorporated in order to be applied in the subsequent year's collection.
The population is adjusted annually to the stratification defined in the methodology, following the indications of the regulations and decisions of the EU

AR comment: No deviations or developments

Confidentiality

The confidentiality of the information is subject to the Data Protection regulations and the Law of the Public Statistical Function of Spanish legislation.
In accordance with confidentiality legislation, data will not be published or shared if they identify the owner of the same.

AR comment: No deviations or developments

ANNEX 1.2 - Quality Report for socioeconomic data sampling scheme

Aquaculture. Census

The quality report fulfils Article 6(3)(d) of the Regulation (EU) 2017/1004. This document is intended to specify data to be collected under chapter II point 3, 5, 6, and 7 of the Delegated Decision annex: Socioeconomic data on fisheries, aquaculture, and any complementary data collection of fishing activity and fish processing. Use this document to describe quality aspects of the data collection process (design, sampling implementation, data capture, data storage and data processing etc.). The annex should be filled for each sampling scheme. Where applicable, use the handbook on sampling design (Deliverable 2.1 from MARE/2016/22 SECFISH study).

Survey specifications
Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex. *Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.* *Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.*
Sector name(s): Aquaculture
Sampling scheme: Census
Variables: All variables in tables 7 and 9
Supra region(s):
Survey planning
Provide a short description of the population the sampling scheme applies to; e.g. '*less active vessels using passive gears*'. This Data Quality report is still in progress
AR comment: No deviations or developments
Survey design and strategy N/A

List data sources; e.g. interviews, registers, log books, sales notes, VMS, financial accounts etc. Describe how the sample sizes were determined. Describe survey methods and distribution; e.g. questionnaire forms by post, by email, on website, by phone etc. access to other datasets etc. Describe the role of auxiliary information, if any, in the strategy: e.g. for validation, cross referencing, fall back data source etc.
AR comment: No deviations or developments
Estimation design
N/A Describe method of calculating population estimate from sample. Describe method of calculating derived data: e.g. imputed values. Describe treatment of nonresponse.
AR comment: No deviations or developments
Error checks
N/A Describe potential errors and how and where in the process these are detected, avoided or eliminated e.g., data; duplication, double counting, respondent error, upload error, processing error etc.
AR comment: No deviations or developments
Data storage and documentation
N/A Describe how the data is stored. Provide link to webpage where additional methodological documentation can be found, if any.
AR comment: No deviations or developments
Revision
N/A Describe the frequency of the methodology review e.g., revision of; segmentation, survey method per segment,

per variable etc.
AR comment: No deviations or developments
Confidentiality
N/A Are procedures for confidential data handling in place and documented? Are protocols to enforce confidentiality between DCF partners in place and documented? Are protocols to enforce confidentiality with external users in place and documented? Are there any issues with publication of data due to confidentiality reasons? Provide an explanation.
AR comment: No deviations or developments

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Processing. Stratified random sampling

The quality report fulfils Article 6 (3) (d) of the Regulation (EU) 2017/1004. This document is intended to specify data to be collected under chapter II, points 3, 5, 6, and 7 of the Delegated Decision annex: Socioeconomic data on fisheries, aquaculture and any complementary data collection of fishing activity and fish processing. Use this document to describe quality aspects of the data collection process (design, sampling implementation, data capture, data storage and data processing etc.). The annex should be filled for each sampling scheme. Where applicable, use the handbook on sampling design (Deliverable 2.1 from MARE/2016/22 SECFISH study), available on the DCF website.

Survey Specifications

Sector name refers to socio economic data on fisheries, aquaculture and any complementary data collection of fishing activity and processing as given in the EU MAP Delegated Decision annex.
Sampling scheme refers to survey technique: by census, by sampling, random or non-random, other (with explanation). If sampling then outline sampling design.
Variables refer to Tables 7, 9 and 10 of the EU MAP Delegated Decision annex. Supra region refers to Table 2 of the EU MAP Implementing Decision annex. If the sampling scheme is the same in all supra regions put 'All Supra regions'.

Sector name(s): Processing

Sampling scheme: Probability Sample Survey

Variables:
Variables defined in the methodology.
The following variables are not collected by the main source of the survey

- -Subsidies on investments
- -Consumption of fixed capital
- -Total value of assets
- -Financial income
- -Financial expenditures
- -Gross Investments, net
- -Debt

Supra region(s):

Survey planning

Units of the survey
The basic survey unit is the industrial company. The company may perform one or more activities in one or more places.
In the scheme of the survey, the company assumes at the same time, the roles of informing unit and observation unit.
However, although the company is the main unit of the survey, given the numerous objectives to be reached with this investigation, there are units that complement the information system, such as the industrial establishment (as observation unit) and the economic activity unit at local level (as analysis unit).
Population scope
The population under sampling is comprised by the companies whose main activity is included in the CNAE-2009 following sections:

- -Section B: harvesting industries
- -Section C: manufacture industry
- -Section D: air conditioning, steam, gas and electric provider
- -Section E: water provider, sanitation activities, waste management and decontamination. .

AR comment: No deviations or developments

Survey design and strategy

Collecting of information

The collection of information is carried out annually by the "*Collection Units*" of INE, responsible also for answering telephones to clear up doubts of the informers and for recording and filtering questionnaires.

The process of this collection of reference year "t" is carried out from the second trimester of the year "t+1", with an aproximate duration of 4 months.

It will be assumed that the company has been surveyed if its main activity is one of those included in the population scope of the survey; also, if the questionnaire has been obtained duly fullfilled and the data comply with the consistency and completeness as established.

Besides, during the collection of all the information, some incidences may arise that dont allow to obtain the questionnaire: definite closure of the bussines, temporary closure o inactive company, mistakenly included in the survey, not in the scope, duplicated or impossible to locate, negative or not responding.

Models of questionnaires

Four models of questionnaires have been designed with the purpose of adequating the requested information to the specific features of the companies:

- Companies with less than 10 employees.
- Companies between 10-49 employees.
- Companies with 50 or more employees and whose activity is included in sections B and C of CNAE-2009.
- Companies with 50 or more employees and whose activity is included in sections D and E of CNAE-2009.

Sampling and design

Population framework: Companies Central Directory ("*DIRCE*") which contains the information on the companies identification, as well as its main economic activity, location and size.

Type of sampling. Estratification

The population under study has been divided in different strata, according to the following variables:

- Company main activity, at 4 digit level (class), according to CNAE-2009.
- Autonomous region
- Company size interval, depending on the number of employees:
  - Up to 3 employees
  - From 4 to 9
  - From 10 to 19
  - From 20 to 49
  - 50 or more employees
- Characteristics of the subsidiary company (if it is subsidiary of a foreign company or not)

It has been thoroughly investigated those companies with 50 or more employees, as well as all companies included in the "*Foreing subsidiary companies*" record in Spain. Also, all companies that, although with a small size in terms of employees, have an important facturation volume, have been exhaustively surveyed.

The rest of the companies have been sampled. Each stratum, which has been determined by the crossing of the above mentioned variables, has conformed an independent population, in terms of the sampling.

Size sampling. Affixation.

Within each stratum, it has been calculated the size sample by optimum affixation or Neyman´s affixation, by fixing in advance the relative sampling error for the variable "number of employees", at national level of 1%, and at regional level of 5%.

The size sampling has been increased, if necessary, to a minimum of two companies by stratum. On the other hand, and with the purpose of reaching more precise aggregated results, it has been determined by statistical criteria, within each strata, the outlier companies (in terms of facturation volume and employees) with the objective of including them in the thorough part of the sample.

By size intervals, sampling fraction have been as follows:

Strata by size	**Sampling fraction**
Up to 3 employees	10%
From 4 to 9 employees	29%
From 10 to 19 employees	42%
From 20 to 49 employees	69%
50 or more	100%
TOTAL	21%

Size selection: by means of the assigning aleatory number, which allows the coordination of the sample with other surveys. The selection process is independent from one year to another: the probability of a company being selected in year "t" is independent from the fact that this company has been selected the previous year (t-1).
AR comment: No deviations or developments
Estimation design
The theoretical design of the sampling work is developed in the published methodology https://www.ine.es/metodologia/t37/metodologia_eee2019.pdf
AR comment: No deviations or developments
Error checks
Described in published methodology https://www.ine.es/metodologia/t37/metodologia_eee2019.pdf
AR comment: No deviations or developments
Data storage and documentation
The data is stored in databases and the documentation and publication of results can be seen on the website of the Ministry. https://www.ine.es/metodologia/t37/metodologia_eee2019.pdf
AR comment: No deviations or developments
Revision
The population is adjusted annually to the stratification defined in the methodology.
AR comment: No deviations or developments
Confidentiality
The confidentiality of the information is subject to Law 12/1989 on the Public Statistical Function establishes that the INE cannot disseminate, nor do available in any way, individual or aggregated data that could lead to identification of data previously unknown to a person or entity. The INE adopts the logical, physical and administrative measures necessary so that the protection of confidential data is effective, from data collection to publication.
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