French Directorate of Marine Fisheries and Aquaculture

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/…

laying down rules on the format for the submission of work plans and annual reports for data collection in the fisheries and aquaculture sectors

FRANCE Work Plan for data collection in the fisheries and aquaculture sectors

2022-2024

Version 4

Paris, 20th December 2021

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Scientific survey – IBTS_Q1 ..... **Erreur ! Signet non défini.**
Scientific survey – IBTS_Q4 - CGFS ..... **Erreur ! Signet non défini.**
Scientific survey – IBTS_Q4 - EVHOE ..... **Erreur ! Signet non défini.**
Scientific survey – LangolfTV ..... **Erreur ! Signet non défini.**
Scientific survey – MEDIAS ..... **Erreur ! Signet non défini.**
Scientific survey – MEDITS ..... **Erreur ! Signet non défini.**
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Data collection framework at national level

General comment: Use this text box to describe how data collection is organised in your Member State (institutions involved, contact information) and in which regional coordination groups (RCG) your Member State participates.

National coordination

Ministère de l'agriculture et de l'alimentation
Direction des pêches maritimes et de l'aquaculture
Sous-direction de la ressource halieutique
Bureau de l'appui scientifique et des données (BASD)
Tour Séquoia / 92055 LA DÉFENSE Cedex
http://agriculture.gouv.fr/

Louise Véron, national correspondent
Generic Email: mas.sdrh.dpma@agriculture.gouv.fr
Personal Email: louise.veron@agriculture.gouv.fr

RCG participation
France is involved in the following Regional Coordination Groups :

- RCG Large Pelagics (LP)
- RCG North Atlantic, North Sea and Eastern Arctic (NANSEA)
- RCG ECON
- RCG Mediterranean &Black Sea (Med&BS)

Partner institutions

1. Direction des pêches maritimes et de l'aquaculture (DPMA - Ministère de l'agriculture et de l'alimentation / Ministère de la Mer)
Sous-direction de la ressource halieutique
Bureau de l'appui scientifique et des données
Tour Séquoia / 92055 LA DÉFENSE Cedex

The Directorate for Sea fisheries and Aquaculture operates as a contractor for the collection of biological, ecosystem and activity data. It is responsible for the following sampling schemes :
- At-sea sampling (ObsMer) in mainland France (Corsica excluded).
- On-shore sampling (ObsVentes) in mainland France (Corsica excluded).
- Recreative fisheries : mandatory reports for blue fin tuna fisheries

Contact details :
Louise Véron, national correspondent
Generic Email: mas.sdrh.dpma@agriculture.gouv.fr
Personal Email: louise.veron@agriculture.gouv.fr

2. Service de la Statistique et de la Prospective (SSP)

Ministère de l'Agriculture et de l'Alimentation
http://agreste.agriculture.gouv.fr/

The SSP contributes to the processing of economic and social data for fisheries and aquaculture.
SSP is responsible for the following sampling schemes :
- sensus
- probability sample survey in all regions
- indirect survey in all regions

Contact details :
Marie-Dominique Minne (for fisheries data): marie-dominique.minne@agriculture.gouv.fr
Anaël Delorme (for aquaculture data) : anael.delorme@agriculture.gouv.fr

3. Institut français de recherche pour l'exploitation de la mer (IFREMER)
Station Ifremer de Nantes, Rue de l'Île d'Yeu, BP 21105, 44311 Nantes Cedex 5
https://sih.ifremer.fr/

IFREMER is a contributor in the four regions in which France conducts fisheries activities, *i.e.* the North Sea and Eastern Arctic, North Atlantic, Mediterranean and 'Other Regions'. IFREMER contributes to the collection of economic data, biological data, activity data, research surveys at sea, and ecosystem data.
IFREMER is responsible for the following sampling schemes :
- all mandatory scientific surveys and complementary scientific surveys (FRAE, Langolf TV, PELGAS PRO)
- On-shore sampling (ObsVentes) in Outermost Regions (except Mayotte)
- Biological parameters in all regions (Obsbio)
- Self-sampling at-sea (Obsauto)
- Activity surveys in all regions
- Effort and socio-economic surveys at landings (ObsDeb) in Outermost Regions (except Mayotte)

Contact details :
Florent Renaud (for scientific survey and coordination) : Florent.Renaud@ifremer.fr
Joël Vigneau (for biological data collection) : Joel.Vigneau@ifremer.fr

4. Institut de recherche pour le développement (IRD)
French National Research Institute for Sustainable Development
OB7 - Observatory of Exploited Tropical Pelagic Ecosystems
UMR 248 MARBEC – Marine Biodiversity, Exploitation and Conservation
Avenue Jean Monnet - BP 171, 34 203 Sète Cedex France, ,
https://www.ob7.ird.fr/

IRD contributes to the French National data collection in the tropical Indian and central-east Atlantic regions with regards to tropical tuna fisheries (purse seine, bait boat and pelagic longline). IRD contributes by gathering data for the collection of tuna catch and length frequency data (sampling at landings and transhipments for both purse seine and bait boat fisheries), discards data (at-sea observers for purse seine and pelagic longliners and self-reporting for pelagic longliners) and biological data (sampling at processing factories). The "Observatoire des Ecosystèmes pélagiques tropicaux exploités" in charge of this contribution to DCF has been IS0 9001 certified since 2009.
IRD is thus responsible for the following sampling schemes:
- Large pelagic sizes on foreign shores in all other regions (TunaSamplingOnShore)
- Large pelagics at sea in all other regions (Observe)
- Large pelagic biological data in foreign tuna canneries (Tunabio)

- Local market sampling scheme in ICCAT area (LocalMarketSamplingOnShore)

Contact details :
Julien Lebranchu: julien.lebranchu@ird.fr

5. Institut d'Économie et de Management de Nantes (LEMNA)
Nantes Institute for Economics and Management
Chemin de la Censive du tertre, BP 52231, 44322 Nantes Cedex 3

LEMNA contributes to the collection of economic and social data for fisheries and for aquaculture, in close collaboration with SSP.
LEMNA is responsible for the following sampling schemes :
- Collection of economic and social data for aquaculture through the collection of accounting datas
- Collection of economic and social data for fisheries through the collection of accounting datas

Contact details :
Véronique Lebihan (for fisheries data) : veronique.lebihan@univ-nantes.fr
Baptiste Morineau (for aquaculture data) : Baptiste.Morineau@univ-nantes.fr

6. FranceAgriMer
Marchés Études et Prospective
FranceAgriMer, TSA 20002, 12, Rue Rol Tanguy, 93555 Montreuil Sous Bois.

FranceAgriMer contributes to the collection of data related to recreational fisheries at sea. Thus FranceAgriMer is thus responsible for the following sampling scheme :
- Off-site survey on recreational fisheries through online panel

Contact details :
Guillaume Nouvel : guillaume.nouvel@franceagrimer.fr

7. Office français de la Biodiversité (OFB)
French agency for biodiversity
"Le Nadar" Hall C,
5, Square Félix Nadar
94300 Vincennes.

OFB contributes through the collection of data on inland waters on eel, and operates data collection for Mayotte's marine fisheries through its Natural Marine Park in Mayotte.
Thus, OFB contributes to the following sampling schemes :
- On-shore sampling (ObsVentes) in Mayotte
- Effort and socio-economic surveys at landings (ObsDeb) in Mayotte
- All sampling schemes related to eel (eel sampling purchase, eel scientific surveys, eel mandatory reports CESMIA)

Contact details :
Clarisse Boulenger (for eel data collection) : Clarisse.Boulenger@ofb.gouv.fr
Cyrielle Jac (for data collection in Mayotte) : cyrielle.jac@ofb.gouv.fr

8. Muséum National d'Histoire Naturelle (MNHN)
National museum for Natural History
57, rue Cuvier, CP 26, 75 231 Paris Cedex 05

The MNHN contributes to the collection of biological data for elasmobranchs. MNHN is responsible for the following sampling scheme :
- EOS : Elasmobranches on Shore in the North Sea and Eastern arctic and North East Atlantic regions.

Contact details :
Sebastien Mayot or Thomas Barreau (for biological data collection) : sebastien.mayot@mnhn.fr; Thomas.barreau@mnhn.fr

9. Office de l'environnement de la Corse (OEC)
Agency for Corsica environment
14 Avenue Jean Nicoli - 20250 Corte
https://www.oec.corsica/

OEC contributes to biological data collection in Corsica and is thus responsible for the following sampling scheme :
- CF-DCF which includes at-sea and landing observations, length and biological data collection. This sampling scheme will also include on-board data collection on the impacts of benthic nets on VME.
- CRF-DCF which includes length and weight data for catches collected from notebooks filled in by recreational fishermen with a licence to fish in specific areas of the natural reserve of the Strait of Bonifacio (RNBB). This sampling scheme will include, for the year 2023, roving surveys of recreational fishermen, for length and weight data collection carried out by scientific staff throughout the RNBB.

Contact details:
Marie-Catherine Santoni: Marie-Catherine.Santoni@oec.fr
Sébastien Susini: Sebastien.Susini@oec.fr

10. Institut national de recherche pour l'agriculture, l'alimentation et l'environnement (INRAE)
National Research Institute for Agriculture, Food and Environment
INRAE - U3E - Unité Expérimentale d'Ecologie et d'Ecotoxicologie aquatique
65, rue de St Brieuc, 35 042 Rennes Cedex, France

INRAE contributes to data collection for salmon and sea trout in inland and collecting biological samples from estuary and marine commercial landings for sea trout.
Thus INRAE contributes to the following sampling schemes :
- Salmon and sea trout scientific surveys in North-East Atlantic and North Sea and Eastern Arctic
- Mandatory reports commercial salmo salar and salmo trutta
- Mandatory reports recreational salmo salar
- Sea trout sampling purchase (only Saint Jean de Luz auction)

Contact details :
Frédéric Marchand : frederic.marchand@inrae.fr
Didier Azam : didier.azam@inrae.fr

Text Box 1a: Test studies description

General comment: This text box fulfils Chapter II, section 1.2 of the EU MAP Delegated Decision annex. This text box applies to the work plan and the annual report.

TunaBioStomach

1. Aim of the test study

The sampling scheme aims to collect stomach samples from the three target species which are fished by European purse seiners in the tropical tuna distribution area in the Central Eastern Atlantic Ocean, and landed at the port of Abidjan. Stomachs are collected during biological sampling at canneries or by purchasing. The samples are subject to prey analysis.This study will be funded through DCF/EMFAF fundings.

2. Duration of the test study

The study is planned for the duration of the NWP, i.e. three years. The purpose is to integrate the regular data collection for the next period if the conclusion study is relevant.

3. Methodology and expected outcomes of the test study

Population targeted: The population targeted are the major tropical tuna stocks of Atlantic ocean exploited by the European purse seine fishery.

Population sampled: The sampled population are the three target tropical species (Thunnus albacares YFT, Thunnus obesus BET and Katsuwonus pelamis SKJ) exploited by the European purse seine fishery in the Eastern Atlantic Ocean. The sample design concerns exclusively the Abidjan harbour.

Stratification: Population is stratified according to the following features:

- the species
- the development stages (juvenile, sexually immature, sexually mature)
- the fishing area
- the fishing date (reproductive and rest periods)
- the fishing_mode (FAD or free swimming school)

Sampling design description:

In the case of fish from the cannery, sampling is done randomly: the collection team does not choose the vessel or the well (and therefore the fishing date, position, mode). The processing factory mainly works on YFT tuna and on large individuals (> 80 cm): it will be necessary to make purchases directly from the vessels. In the case of fish (BET, SKJ and small YFT) purchased from shipowners, the well (and therefore the fishing date, position, mode) as well as the size categories can be selected. The selection thus makes it possible to have the most extensive temporal and spatial coverage.

Samples must be collected regularly throughout the year to obtain good representativeness of the population. For the first year (2022), the goal is to set up a routine for sampling and analyses. 60 stomachs per species and per quarter will be analysed: 20 juveniles, 20 immature and 20 mature. Ultimately, 300 stomachs per species will be analysed, with a distribution of 75 per quarter including 25 juveniles, 25 immature and 25 mature.

Sampling protocol documentation:

During biological sampling carried out in factories or following fish purchases, whole stomachs are weighed individually to the nearest gram, then emptied if necessary, cleaned and reweighed empty to obtain the weight of stomach contents. All of the stomach contents of the same sample are stored individually in 10% formaldehyde.

For analysis, the contents are rinsed with clear water for 12 to 24 hours. Preys are identified at the lowest possible taxonomic level and separated according to their state of digestion (established for each large groups

of prey: fish, cephalopods, crustaceans, gelatinous). Each individual or group of individuals in the same category is weighed to the nearest gram or hundredth of a gram. Photo are taken and archived. Depending on the state of digestion, individuals are measured to the nearest millimeter according to their morphology: fork length (FL) or pre-dorsal length (LD1) for fish, mantle length for cephalopods, shell length for crustaceans. The number of individuals per group of prey is counted. For each prey taxon, the wet volume is measured. Several indices are thus calculated from the analyses:

- the proportion of empty stomachs
- the percentage of abundance (% N)
- the volume percentage (% V) - average abundance (% MN)
- the average volume (% MV)
- dietary changes (degree of overlap between size classes)

The stomach content analyses will be done with the following equipment:

- a scale (1 gram accurate, for weight measurements);
- a high precision scale (0.1 gram accurate, for weight measurements);
- a stereo-microscope (for identification);
- a magnifying glass (for identification);
- an imaging station with Lumenera Software Infinity Analyze and Capture (for photo and size measurements);
- a fish ruler (for weight measurements);
- a digestion rate scale according: Bard FX (2001). Apparent effect of stomach repletion on catchability of large tunas to longline gear. Comparison with other fishing gears. Coll Vol Sci Pap ICCAT, 52: 452-465.

(max 900 words per study)

Text Box 1b: Other data collection activities

General comment: This text box applies to the work plan and the annual report. Use this text box to provide information on other data collection activities that relate to your EMFAF operational programme and need to be included in the work plan and the annual report. Describe activities that are funded by the DCF but fulfil objectives under other EMFAF priorities, like marine knowledge, or activities funded by the DCF, but without a direct link to the EU MAP specific requirements or WP template tables, like freshwater fisheries. You can also include one-off specific studies for a particular end-user need that do not enter the regular data collection.

I. Supporting tools – RCG Secretariat

1. Aim of the data collection activity

Developing mechanisms to support the planning and execution of administrative tasks and the branding and online visibility of the RCGs, with the aim to establish a long term supportive structure.

Activity done under Project SecWeb (Mare 2020-08).

2. Duration of the data collection activity

01/01/2022 – 31/12/2022

Secweb project duration was started 01/01/2021 and will end on 31/12/2022. This project is funded by DG MARE, and thus not by EMFAF. Future fundings after 2022 still need to be determined. Dedicated agreement may be added in NWP in future revision.

3. Methodology and expected outcomes of the data collection activity

The Regional Coordination Groups (RCGs) are the main hub for regional coordination and cooperation between member states within the different regions. The RCGs should in accordance with Council regulation (EU) 2017/1004 aim at developing and implementing procedures, methods, quality assurance and quality control for collecting and processing data with a view to enabling the reliability of scientific advice to be further improved. The RCGs may further prepare draft regional workplan, complementing or replacing the national workplan MS submit to the Commission on a regular basis. The RCGs have further a key role to interact with end-users of scientific data (EU) 2017/1004 and to, after end-user consultation, coordinate and agree on details in data to be collected and managed on the regional level ((EU) 2021/1167).

All the above is of interest to all member states, active in one or more regions.

This project on developing the supporting tools is currently funded by the Commission. For the long term development of the tools to support the work of the RCGs, and as such support the different MS, suggestions were presented and discussed at the RCGs (NA NS&EA and Baltic) technical meetings in June 2020 & 2021 and presented to the NCs during the Decision meeting in September 2020&2021. In principal, the MS agrees, but the NCs requested more time to take this into account, and requested a better insight in what would be provided before a national contribution for the funding decided. Therefore, within this project, the different business scenarios are further developed and will be presented to all member states.

Objectives of this activity is to:

1. Develop a framework and setup a secretariat in support of fluent administrative procedures of the RCGs and establish a suitable long-term financial script for that;
2. Promote good practices in communication within and among the RCGs and engaging with all the MS, and other stakeholders;

3. Develop and setup a website linked with existing (relevant) websites and SharePoint, and to improve the overall capacity to reach out to the member states and to a wider audience about past and present RCG work;
4. Identify tools to increase the visibility of the work and outputs of the RCGs

Methodology

WP 1: Setting up the secretariat in support to RCGs and ISSGs,

The tasks of the RCG secretariat are defined in coordination with RCGchairs. This includes the support to organize RCG meetings, reporting and communication tasks, as well as the follow up of the intersessional work. As a case study, a secretariat is set up to support the RCG NA NSEA & RCG Baltic .

WP2: Developing and operating a website

Based on a process of consultation with the RCG, MS and end-users are contacted to collect input for the website.
Within the website, a repository for documents need to be available where confidential information can be stored. This information is of high value for the members states and will be reachable by the MS..

WP3.Ensuring future operation and funding:

This WP takes into account the output from WP1& and WP2. Through the activities in this WP different business models for long term funding will be developed and presented.

Expected outcomes:

1. The provision of dedicated Secretariat support for the RCGs to ensure the efficient use of RCG MS resource allocation.

2. A website developed by the end of 2021 with following features:

- ✓ Integration – synchronization with third-party applications.
- ✓ Responsive – to serve content across multiple screens and platforms.
- ✓ User experience- maintain a consistently good user experience.
- ✓ Accessibility – All levels of society and end-users need to be able to access in a friendly used way .
- ✓ Retention- keep visitors coming back
- ✓ Links to protected part outside the website as repository for confidential documents

3. Visual identity for RCGs

4. Stakeholders database

5. Internal communication protocol

6. Integration of the results of the Mare2020/08 Annex I project

7. A business scenario acceptable for all MS in the different regions and COM to ensure the long-term existence of a secretariat and the RCG website

A detailed description of the secretariat functions, the implementation of the secretariat, the content of the website, the building blocks of the website and the business model for the provision of Secretariat role and website continuation (updating& maintenance) will be provided.

Future progress in continued support for regional coordination depends on the project's outcomes and the selected route to proceed and fund the required work. As regional coordination is the cornerstone of the

collective approach to data collection, the continuation of the work may be embedded in a regional work plan in the future based on national input and support.

(max 900 words per activity)

Text Box 2.3: Diadromous species data collection in freshwater

General comment: This Textbox fulfils Article 5(2)(a), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II, point 2.1(b) and point 2.3 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used for the data collected from freshwater commercial fisheries for salmon, sea trout and eel, and from research surveys on salmon and sea trout in freshwater, and on eel in any relevant habitat including coastal waters.

EEL

Eel scientific surveys

In accordance with regulation R (EC) No 1100/2007 of 18 September 2007 and in accordance with eel management plan in France index rivers were selected for each eel management unit: FR_Meus / F_Rhin, FR_Arto, FR_Sein, FR_Bret, FR_Loir, FR_Garo, FR_Adou, FR_Rhon, FR_Cors. All these data collections (index River and specific networks) monitor all stages of the eel biologic cycle and the evolution of stocks in place. The choice of index sites makes it possible to investigate different types of environment described by the Grisam:

1. Marshes Atlantic;

2. Mediterranean Lagoons;

3. River Basins <1000 km²;

4. River Basin> 1000 km² plain;

5. River Basin> 1000 km² mountain;

6. Bays closed or Atlantic estuary

Migration control stations implement traps, videocounting or sonar on: Rhine, Somme Bresle Fremur, Vilaine, Sevre Niortaise, Dronne, Soustons, Rhone. Specific eel networks consist of stations followed by electrofishing for calculations of abundance index.

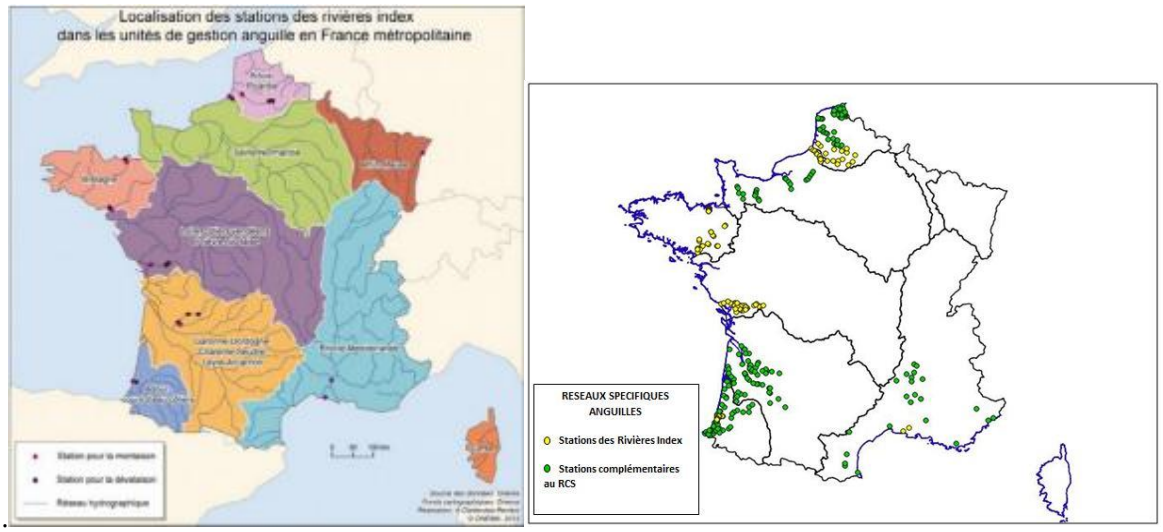


Figure left: location of monitored sites of recruitment and downstream migration; Figure right: location of électrofishing stations - yellow eels

Eel mandatory report CESMIA

In the public river domain, recreational and professional fishermen fishing with gears and nets are monitored under the SNPE (Suivi National de la Pêche aux Engins / National monitoring of fishing with gears by monthly declaration of catches). In this case, monthly reporting is mandatory.

Eel sampling purchase

In addition, biological measurements (length, weight, age and sex when possible) will be performed on fish purchased from commercial fishermen on management units affected by commercial fishing (glass eel, yellow eel and silver eel).

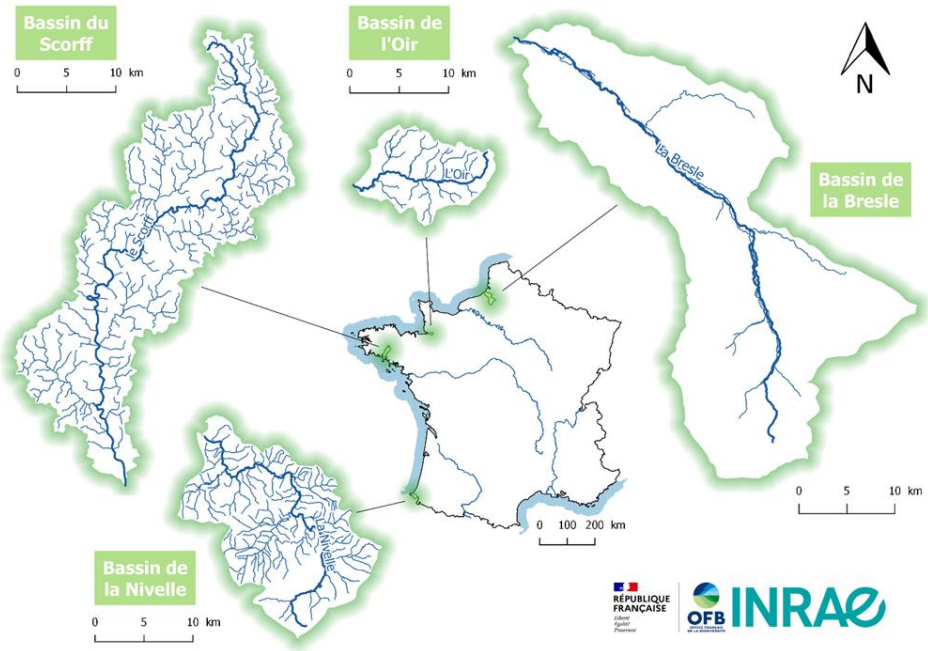
SALMON AND SEA TROUT

Salmon an sea trout scientific surveys

For salmon, there are four index rivers used by the ICES Salmon Group (WGNAS). For sea trout there are currently 2 rivers (Bresle and Oir) and soon the Nivelle which will be used by ICES (WGTRUTTA). There is no sea trout population on the Scorff.

Monitoring of the migration of smolt and adult stages is carried out by trapping. All the rivers are equipped with upstream traps and only the Nivelle does not have a downstream trap and therefore does not allow the monitoring of smolts.

Specific indices are carried out each year by electrofishing on several stations spread over all the sites to monitor the salmon and trout populations in place.



Mandatory reports recreational salmo salar

Reporting of salmon catches is mandatory for recreational salmon fishing. It is practiced in 3 regions:

- Normandy
- Brittany

- Adour

When declaring their catches, recreational and professional fishermen provide information on the length, weight, date and place for the individuals they have caught, usually accompanied by a scale sample.

Mandatory reports commercial salmo salar and salmo trutta

Commercial river fishing for salmon is only carried out on the River Adour.

When declaring their catches, professional fishermen provide information on the length, weight, date and place for the individuals they have caught, usually accompanied by a scale sample.

(max 250 words per species and area)

Text Box 2.4: Recreational Fisheries

General comment: This text box fulfils Article 5(2)(a), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II, point 2.2 of the EU MAP Delegated Decision annex. Use this text box to give an overview of the methodology used for the data collected on marine and freshwater recreational catches.

Description of the sampling scheme/survey according to Table 2.4.

- **Multispecies study for catch estimates (Off-site survey on recreational fisheries through online panel):** Framing study was conducted in 2021 in order to evaluate penetration rate and characteristics of French marine recreational fishermen, as no authorization/licence is required for recreative marine fishery in France. Following this framing study, an panel survey is then conducted through a phone application dedicated to recreative fishery and multi-species estimation of catches is based on extrapolation of catches reported by panelists. During the logbook study, a panel of minimum 200 recreational fishers will be maintained. The panel members report their fishing sessions (geographical area, time spent fishing…) and their catches (species, length, release or not…) in the logbook application. An IFREMER expert followed and approved the methodology used in the survey. An extrapolation of catches will be made periodically based on the adjusted results of the framing study, and the quantities caught will be evaluated by species and fishing area. Fishing activities can be analysed by month with the number of fishing trips and catches by species reported by panelists. Fishing trips can also be divided by fishing zone or department in metropolitan France. Finally, fishing trips can be analysed by the different fishing gear used by fishermen and whether they have catches or not.
  Due to evolution of declarative obligation for recreative fishermen still in discussion at EU level, this scheme will be conducted until 2023, and sampling design may be re-examined in 2024.

- **Mandatory reports of recreational catches of bluefin tuna :** Recreative fishermen have an obligation to have a specific licence in order to fish blue fin tuna in Mediterranean Sea and Atlantic. Moreover, for every blue fin tuna retained, fishermen must report to FranceAgriMer through a dedicated form. This form includes the size and weight of every animal. All landed catches are then reported (excepted illegal ones). Undeclared catches of bluefin tuna are illegal, not included and not estimated. For estimation of catches of Bluefin tuna, all declared catches are summed, no correction method is put in place. See Annex 1.1 for declaration form and quality details.

- **For other ICCAT highly migratory species :** no dedicated scheme is put in place. Catches estimates and biological data (length, weight) are estimated and collected through the multispecies sampling scheme "**Off-site survey on recreational fisheries through online panel**" (see above and Annex 1.1). For swordfish (*Xiphias gladius*), recreational fishing in Mediterranean Sea is only allowed with no-kill, no licence is required. Thus, no catches estimates can be provided for this region.

- **For Corsican Recreational Ficheries Data Collection Framework (CRF-DCF):** Recreational fishing in the natural reserve of the straits of Bonifacio (RNBB) is subject to regulation via quotas and different levels of protection depending on the area. Two specific areas spanning 10 000 ha are subject to fishing authorization by prefectoral decree. A maximum of 400 registered authorizations can be issued per year. These authorizations are issued by the DIRM departments. Recreational fishermen with a fishing authorization in these specific areas are required to return a logbook of their catches. These recreational fishermen collect data on the length and weight of all species catches caught on each trip in these areas. The logbooks are then returned at the end of the year to the RNBB manager (OEC, service espaces protégés) to be banked and exploited.
  For the year 2023, sampling scheme will include roving surveys of recreational fishermen, for length and weight data collection carried out by scientific staff throughout the RNBB spanning 80 000 ha. Sampling in roving surveys is complementary to self-sampling by recreational fishermen. In fact, self-sampling

makes it possible to obtain many samples, but only for pole-and-line fishing over a surface area of 10,000 ha (the only practice authorised in these areas). As for roving surveys, the quantity of samples is reduced, but it makes it possible to cover the whole of the RNBB as well as a wider range of fishing techniques. One of the most represented species in recreational catches in this area is Dentex dentex. When they are caught, all species listed in the EU Map for the Mediterranean Sea and CGPM regulation are considered and sampled, including discard (alive or dead) and accidental catches (see Annex 1.1 CRF-DCF for more information on these zones, logbook format and protocol).

Text Box 2.5: Sampling plan description for biological data

Region : North Sea and Eastern Arctic

General Comment: This text box fulfils Article 5 (2)(a) and (b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2, point 2.1(a) and 4.1 of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

Several programs are running in region North Sea and Eastern Arctic :

- Obsmer for scientific observation at sea, including observation of PETS bycatch.
- Obsventes for scientific observation in auctions
- EOS for scientific observation in auctions of elasmobranchs
- Obsbio for sampling of biological parameters which complements biological parameters sampled during mandatory surveys
- Obsauto for at-sea self-sampling of the unique vessel operating in ICES I, II areas.

Obsmer and Obsventes are complementary, as the priority for species to sample is Obsventes is determined depending on species for which data is lacking through Obsmer. Obsmer protocol is now optimized to meet 4S principle, as vessels are randomly selected in the list of all vessels. Systematic observation of VME is also included for strata M0001 (vessels with a license to fish deep-water species) – work will be done in 2022 to extend VME data collection to all relevant stratas.

Sampling of elasmobranchs in auctions is both covered by Obsventes and EOS, coordination is now put in place between the two programs : EOS is now runned in auctions where high landings of elasmobranch occur. In these auctions, Obsventes effort is reduced on the sampling of elasmobranchs, allowing for more sampling of other fish species. PETS for which commercialization is allowed are sampled by both schemes.

Obsauto is running on a unique vessel performing several weeks trips, and which can not be covered by scientific observers due to cost limitation. This protocol is currently in a phase of setting up, thus documentation will be developed and improved in 2022.

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Region : North-East Atlantic

General Comment: This text box fulfils Article 5 (2)(a) and (b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2, point 2.1(a) and 4.1 of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

Several programs are running in region North-East Atlantic:

- Obsmer for scientific observation at sea, including observation of PETS bycatch.
- Obsventes for scientific observation in auctions
- EOS for scientific observation in auctions of elasmobranchs
- Obsbio for sampling of biological parameters which complements biological parameters sampled during mandatory surveys

- Sea trout sampling purchase for the collection of biological samples from marine and estuarian catches in St Jean de Luz auction

Obsmer and Obsventes are complementary, as the priority for species to sample is Obsventes is determined depending on species for which data is lacking through Obsmer. Obsmer protocol is now optimized to meet 4S principle, as vessels are randomly selected in the list of all vessels.

Sampling of elasmobranchs in auctions is both covered by Obsventes and EOS, coordination is now put in place between the two programs : EOS is now runned in auctions where high landings of elasmobranch occur. In these auctions, Obsventes effort is reduced on the sampling of elasmobranchs, allowing for more sampling of other fish species. PETS for which commercialization is allowed are sampled by both schemes. Dedicated visits to Douarnenez auction will be put in place in 2022 in the context of a new bilateral agreement with Ireland, in order to sample for *Thunnus alalunga* landed by irish vessels in France.

Obsmer protocol is regularly reinforced in the Bay of Biscay during winter period in order to have more information on bycatch of common dolphins – this reinforcement will be maintained during 2022-2024. The full Obsmer protocol is applied during these complementary trips and allows for more data collection (length, discards, catch composition).

"Sea trout sampling purchase" sampling scheme is a new sampling scheme which will be put in place from 2022 onwards in accordance with Table 1 of EU-MAP and is aiming at collecting biological samples from estuary and marine commercial landings for sea trout (size, weight, age, sex). The scheme covers only Saint Jean de Luz auction. As this sampling scheme will be implemented for the first time in 2022, adjustments are possible for the following years.

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Region : Other regions

General Comment: This text box fulfils Article 5 (2)(a) and (b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2, point 2.1(a) and 4.1 of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

The IRD applies four sampling schemes in « other regions » which covers two tropical regions governed by tuna RFMOs (IOTC and ICCAT area):

1. TunaSamplingOnShore: The sampling scheme aiming at collecting length samples and species composition from commercial landings on foreign shores of purse seiner and baitboat for all tuna species.
2. LocalMarketSamplingOnShore: Local market sampling scheme aiming at collecting data onshore of the landed part of the purse seiner and baitboat catch destined to the local market, i.e. not sold the canneries for all species. This scheme covers only the convention area of ICCAT.
3. Tunabio: The sampling scheme aiming at collecting biological features from commercial landings on foreign shores of purse seiner for major tuna species and bycatch.
4. Observe: The sampling scheme aims at monitoring discards of target species (e.g. tunas, swordfish) and retained and discarded bycatch from the French tropical purse seine fishery operating in the Atlantic and Indian oceans, and the pelagic longline fishery in the Indian Ocean.

These sampling schemes are designed to be complementary in order to cover the different fate (discards, canneries and local market) of tuna and bycatch, on the one hand, and the biological data of the main tuna

species (length, weight, sex ration and sexual maturity) and some bycatch like sharks and turtles, on the other hand.

All sampling schemes are detailed in their respective Annex 1.1.

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Region : Outermost Regions

General Comment: This text box fulfils Article 5 (2)(a) and (b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2, point 2.1(a) and 4.1 of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

ObsVentes Outermost region is the only program running in French Outermost regions. The Parc naturel marin de Mayotte (PNMMAY) applies Obsventes protocol (see Annex 1.1 for Obsventes in Outermost regions) on biological sampling of Mayotte, whereas IFREMER applies the same protocol in all other Outermost regions (French Guiana, Guadeloupe, Martinique, La Réunion). Species list for Obsventes Outermost where adapted to fulfil new EU-MAP requirements.

Specificities for ObsVentes in Mayotte :

Targeted population is fish listed on table 2.1 landed for sale in Mayotte. Two species groups can be distinguished: reef fishes from Mayotte lagoon or from some distant reefs exploited by handline fishing and large pelagic fishes catched by handline fishing, trolling or longline fishing as part of France contribution to IOTC. Reef fishes listed on table 2.1 are *Aprion virescens*, *Caranx melampygus* and *Variola louti*.
Additionnal species like *Etelis spp*, *Aphareus spp* or *Brama spp* included into new fisheries may be sampled.

The population sampled is the species landed on the main fishery landings sites around Mayotte (Dzaoudzi at Petite-Terre, Mamoudzou in the east of Grande-Terre, M'tsahara in the north, Nyambadao in the south and Chiconi at west). Fish is sold unsorted to fishmongers or individuals as soon as it is landed, thus technicians have to make all the measurements quickly during selling.

PNMMAY sampling frame identifier is formatted like 2022_V0790 - EU-MAP_22_OFB_PNMMAY, 2022 and 22 corresponding to implementation year. 36 PSUs planed each year from 2022 to 2024. Due to longline fishing fleet evolution as expected from year 2022, at-sea surveying will not be possible. So Obsventes sampling will be extended to integrate this large pelagic fishery. The sampling frame identifier format is 2022_V0791 - EU-MAP_22_OFB_PNMMAY and 24 PSUs are planned at the port of Mamoudzou. For the moment, fishers approbation is not assessed and the start date of their activity is not known yet. The number of PSUs and work methods have to be adapted with time.

Usually, there is no problem to access to the landing sites. Nevertheless, access to the catches can be refused by ship's crew depending on their mood. Sometimes, catches are taken to be sale away from landing site. Mayotte has multiple scattered fish landing points making sampling effort difficult. Catch frequency of a species can be too low. We plan to systematically sample *Aprion virescens*, *Caranx melampygus* and *Variola louti* met during ObsDeb program to ensure an annual acceptable sample size.
Hopefully, the seven forthcoming fish markets under construction will permit the data collect enhancement in future years.

Perspectives for biological sampling in Outermost regions :

IFREMER and PNMMAY are running a test study (not funded by EMFF/EMFAF) aiming at testing new methodologies for biological data collection in OM regions. This implies purchase of fishes – this pilot study will be runned in 2021-2023. If successful, these new methodologies could be added from 2023 or 2024 as a new sampling scheme in NWP and provide complementary biological data to length data currently collected.

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Region : Mediterranean and Black Sea

General Comment: This text box fulfils Article 5 (2)(a) and (b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2, point 2.1(a) and 4.1 of the EU MAP Delegated Decision annex. This text box complements Table 2.5.

Several programs are running in region Mediterranean and Black Sea :

- Obsmer for scientific observation at sea, including observation of PETS bycatch, in continental Mediterranean cost.
- Obsventes for scientific observation in auctions on continental Mediterranean cost.
- CFDCF (DACOR) for scientific at sea observation in Corsica
- Obsbio for sampling of biological parameters which complements biological parameters sampled during mandatory surveys

Obsmer/Obsventes :

Obsmer and Obsventes are complementary, as the priority for species to sample is Obsventes is determined depending on species for which data is lacking through Obsmer. Obsmer protocol is now optimized to meet 4S principle, as vessels are randomly selected in the list of all vessels.

Obsmer protocol was previously targeting only longliners and trawlers in Gulf of Lion for the Mediterranean and Black Sea region. During 2022-2024, NWP will aim to extend sampling to netters (M0018) and vessels operating in ponds/lagunas (M0019). This will allow for a better understanding of catches by these fleet and better knowledge of bycatches. Perspective is to set a low effort on this strata as a test in 2022, and increase it progressively in 2023 and 2024 depending on possibility to go onboard. Indeed, Mediterranean French fleet outside of trawlers and longliners is mostly composed of small vessels, for which security requirements may not be fulfilled to welcome observer onboard.

CFDCF (DACOR):

For Corsica, the same sampling scheme as in previous years is used (see Annex 1.1) and continue to collect data on the occurrence (number of individuals per species and the length, in the appropriate unit for the species concerned) of incidental catches of all seabirds, mammals, reptiles and fish species protected under EU legislation and international agreements, including species listed in Table 2 and PETS. For the years 2022-24, the number of PSUs planned per year has been adjusted. 85 trips for the demersal stratum and 10 trips for the pelagic stratum are planned each year (previously 62 demersal and 11 pelagic per year). For the years 2022-24 this sampling scheme will also include on-board data collection on the impacts of benthic nets on VME. On-board scientific observers will determine the species or taxa of benthic invertebrates identified as indicators of VME in the UE MAP and collected opportunistically during the entire fishing trip. Data shall be collected on the occurrence (number of individuals per species or taxa, in the appropriate unit for the species concerned). Weight by species or taxa will be collected when boarding conditions and weather permit. An experimental protocol will be tested and may be adapted according to the species collected and

the types of habitat impacted. The determination of species and taxa can be carried out on the basis of photos which will be communicated to the group experts for specific identification.

In 2022-2023, the opportunistic data collected on Corsican small-scale coastal fishing enables the obligations of the GFCM Reference Framework for the collection of data on GSA 8 concerning the species concerned by Annex A (groups 1,2,3) and Annex E. The CF-DCF sampling scheme is therefore adapted to the list of required species/stocks indicated in table 2.1 of the NWP 2022-2024.

The CF-DCF sampling plan and the data collected on Corsica respond to the Measures and sub-measures of the DCSMM monitoring programme as well as to the objectives and indicators of the Strategic Facade Document for France (DSF). The data collected on small-scale coastal fishing also makes it possible to respond in large part to the GFCM's Regional Action Plan for small-scale fisheries in the Mediterranean and Black Sea (RPOA-SSF). This data collection is also integrated into the management plan of the Strait of Bonifacio nature reserve for the next 10 years.

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Text Box 2.6: Research surveys at sea

General Comment: This Text box fulfils Article 5 (1)(b), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapters I and II of the EU MAP Implementing Decision. It is intended to specify which research surveys at sea set out in Table 2 of the EU MAP Implementing Decision will be carried out. Member States shall specify whether the research survey is included in Table 2 of the EU-MAP Implementing Decision or whether it is an additional survey.

1. International Bottom Trawl Survey - IBTS_Q1 (French survey)

1. Objectives of the survey

The IBTS surveys conducted by France every year during the first quarter (January-February), as part of the International Bottom Trawl Survey primarily aimed at the annual estimates of abundance indices (total, by age and recruitment) for the main commercial demersal fish species exploited in the North Sea. The main species targeted are whiting, cod, haddock, Norway pout, herring, sprat, mackerel and plaice. The collected data are used for respective stock assessment. The first surveys were organised in the 1960s. The survey is listed in 2021/1168 Table 1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

Since 2016, the IBTS working group defined a new allocation of the sampling areas between countries in order to reduce time at sea. As a result, 55 hauls were allocated to the french IBTS survey, which samples the Southern North Sea and the Eastern English Channel over a period of 21 days. The hauls are being carried out by using the research vessel Thalassa according to the IBTS protocols defined at international level under the coordination of the ICES WGIBTS. Each fishing operation is systematically associated with a hydrological station and acoustic data are recorded for several echosounder frequencies and stored to be processed on shore.

Manual for the International bottom trawl surveys:

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20-%20Manual%20for%20the%20International%20Bottom%20Trawl%20Surveys%20-%20Revision%20IX.pdf

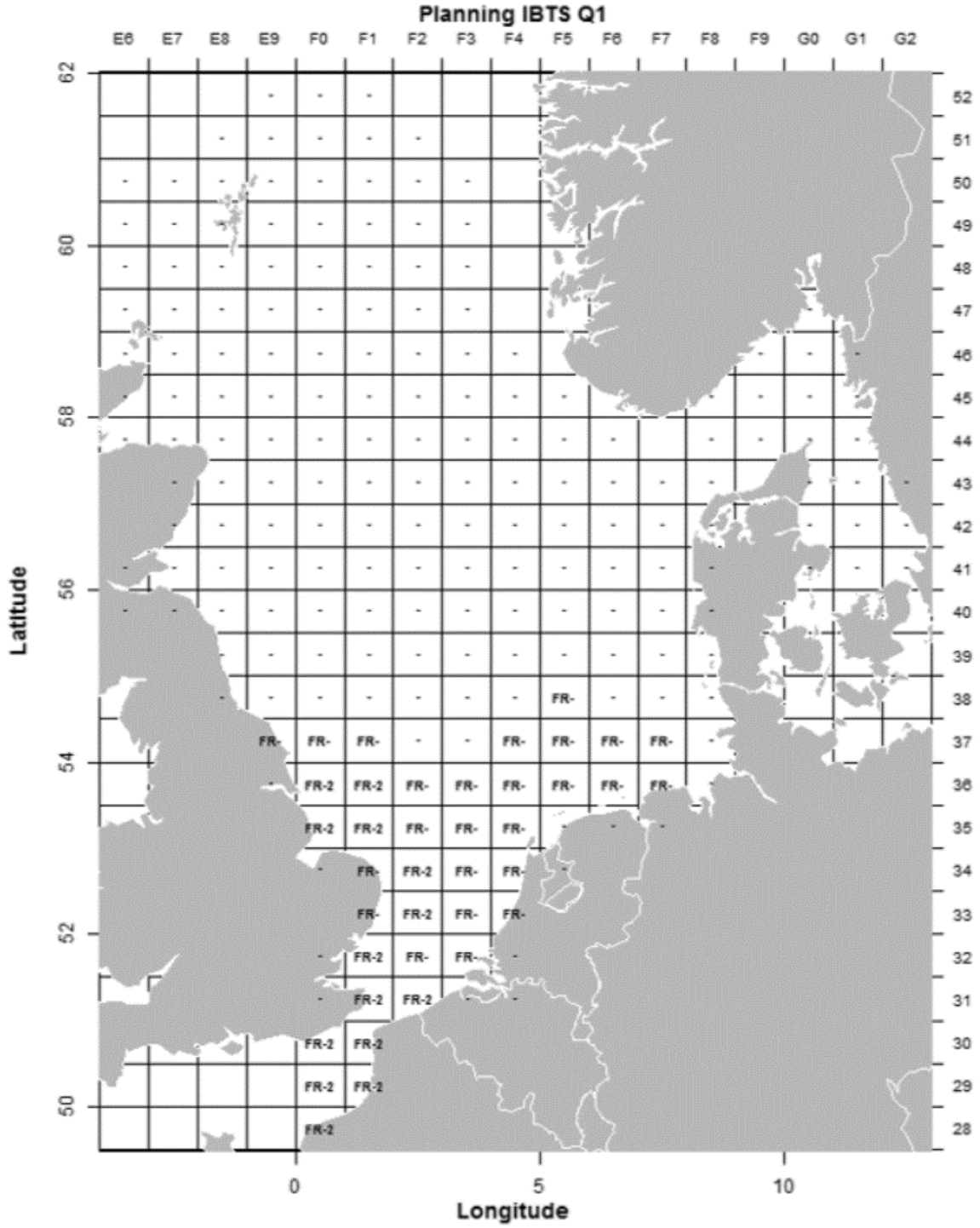
Age-length keys are built for the main fish species: whiting, cod, haddock, Norway pout, herring, sprat and plaice. To estimate larval abundance indices (group 0 for herring and sprat), night sampling with a MIK (Methot-Isaac-Kidd) net is carried out following the standard protocol. Since 2006, continuous sampling of plankton (one sample per hour) is performed by means of the Continuous Underwater Fish Eggs Sampler device (CUFES). Sampling plans for monitoring phytoplankton, benthos and marine litter, as well as bird and mammal observations were initiated in 2008, thus demonstrating the multidisciplinary character of the IBTS survey and the efforts to ensure optimum use of the observation platform provided by R/V Thalassa.

The data are checked and validated on board, where they are recorded in a temporary database. On land, quality checks are applied to the data both internally and by the ICES Datras system. Following their final validation on land, the IBTS data are uploaded to the “Scientific surveys” module of Ifremer’s Harmonie database. All data sets are also transmitted in the ICES-stipulated formats.

Datras website: https://datras.ices.dk/

The protocols and scheduled operations lead to the calculation of ecosystem indicators. Raw data and indicators are available.

Website: http://www.ifremer.fr/SIH-indices-campagnes/index



IBTS_Q1 French survey sampling scheme

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The southern North Sea area is sampled by France and partly by the Netherlands and Denmark.

The main assessment groups using IBTS data are the Herring Assessment Working Group (HAWG) for the area "South of 62°N" (trawl data and larvae net station data), the Working Group on the assessment of demersal stocks in the North Sea and Skagerrak (WGNSSK), and the Working Group on Assessment of New species (WGNEW). The International Bottom Trawl Survey Working Group (WGIBTS) also needs the data.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Hauls stations are allocated between countries by WGIBTS. There is no survey cost sharing agreement involving France.

(max 450 words per survey)

2. Sardine, Anchovy, Horse Mackerel Acoustic Survey – SAHMAS (French survey)

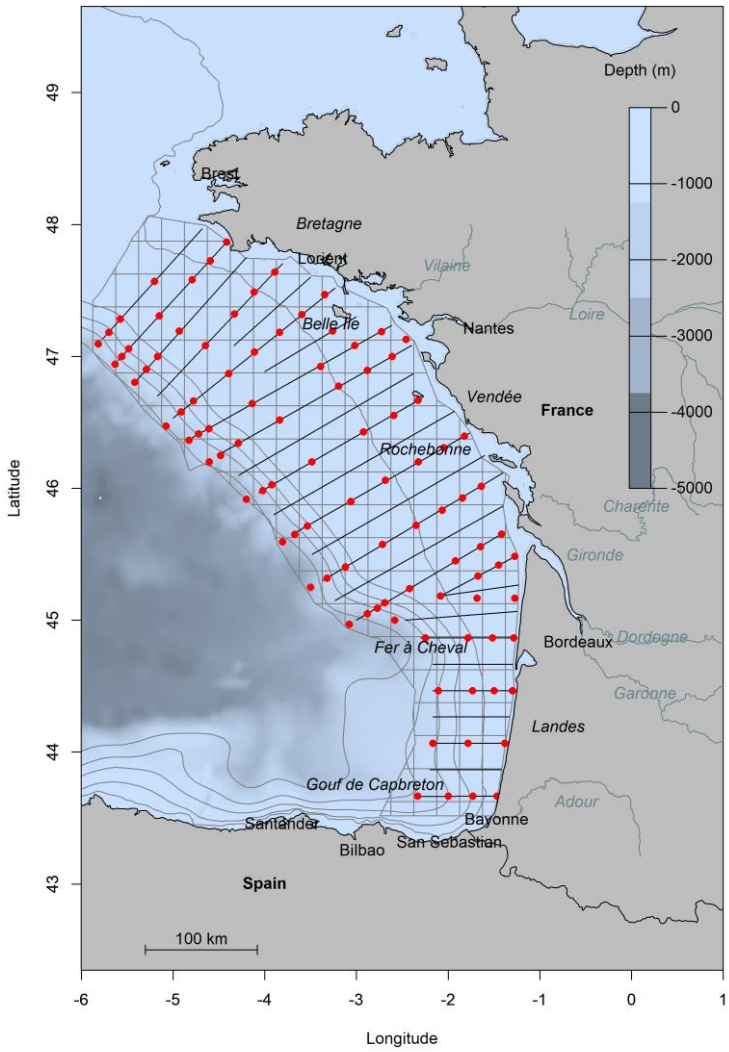
1. Objectives of the survey

The PELGAS survey is the French contribution to the international Sardine, anchovy, horse mackerel acoustic survey (SAHMAS) in the Bay of Biscay. The PELGAS survey aims at monitoring the Bay of Biscay pelagic ecosystem, in order to provide scientific data for implementing an ecosystem-based management of Biscay living resources. The spatial and temporal dynamics of small pelagic fish populations are specifically monitored, with focus on anchovy and sardine. The survey takes place in spring (April-May), during anchovy and sardine spawning, to allow for the assessment of both eggs and adult stages. Anchovy, sardine, horse mackerels, sprat, boarfish, blue whiting and mackerels biomass estimates and information on population structure (length and age structure for anchovy and sardine, length structure for other species…) are derived from the survey data. Anchovy and sardine eggs distribution and abundance, as well as hydrological conditions are also assessed during the PELGAS survey. The survey is listed in 2021/1168 Table 1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The PELGAS survey is internationally coordinated by the ICES WGACEGG working group. Methods have been validated by WGACEGG and are described in details in the survey protocols manual: https://doi.org/10.17895/ices.pub.7462

The survey is performed in May on board R/V Thalassa. Data are collected continuously during daytime along 27 parallel transects covering the whole Bay of Biscay. Multibeam and multifrequency (6 frequencies) echosounders provide real time information on the spatial patterns and abundance of small pelagic fish. Simultaneously, a Continuous Fish Eggs Sampler (CUFES) provide complementary information on anchovy and sardine eggs. The presence and abundance of seabirds and marine mammals are also continuously recorded along transects during daytime. The species composition of fish school echoes are identified by midwater trawling, performed in an adaptative manner. CTD stations and zooplankton net casts are performed at night to characterize the small pelagic fish biotic and abiotic environment.



SAHMAS French survey sampling scheme. Black lines: daytime transects, red dots: night-time hydrobiological stations.

Acoustic data are recorded in real time and processed using the Movies3D software. CUFES samples are processed onboard using the Zoocam egg and mesozooplankton scanner system, which allows for the semi-automatic identification and counting of anchovy and sardine eggs. Fish biological samples are recorded and analysed at sea, including anchovy and sardine age readings. Acoustic and fishing data are combined using the EchoR R package, to derive small pelagic fish biomass estimates and distribution maps.

Acoustic and fishing data, as well as biomass assessment results are stored in the EchoBase relational database. Acoustic and fishing data are shared within the ICES ACEGG working group. They are being stored in the ICES dedicated database: https://www.ices.dk/data/data-portals/Pages/acoustic.aspx.

Anchovy, sardine, mackerels, horse mackerels, blue whiting and boarfish biomass estimates derived from data collected during PELGAS are provided to ICES stock assessment groups (WGHANSA and WGWIDE).

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The PELGAS survey is the French contribution to the international Sardine, anchovy, horse mackerel acoustic survey, covering the Bay of Biscay. The survey is internationally coordinated within the ICES WGACEGG working group, comprising scientists from Spain, Portugal, France, United Kingdom and Ireland.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.
Not applicable.

(max 450 words per survey)

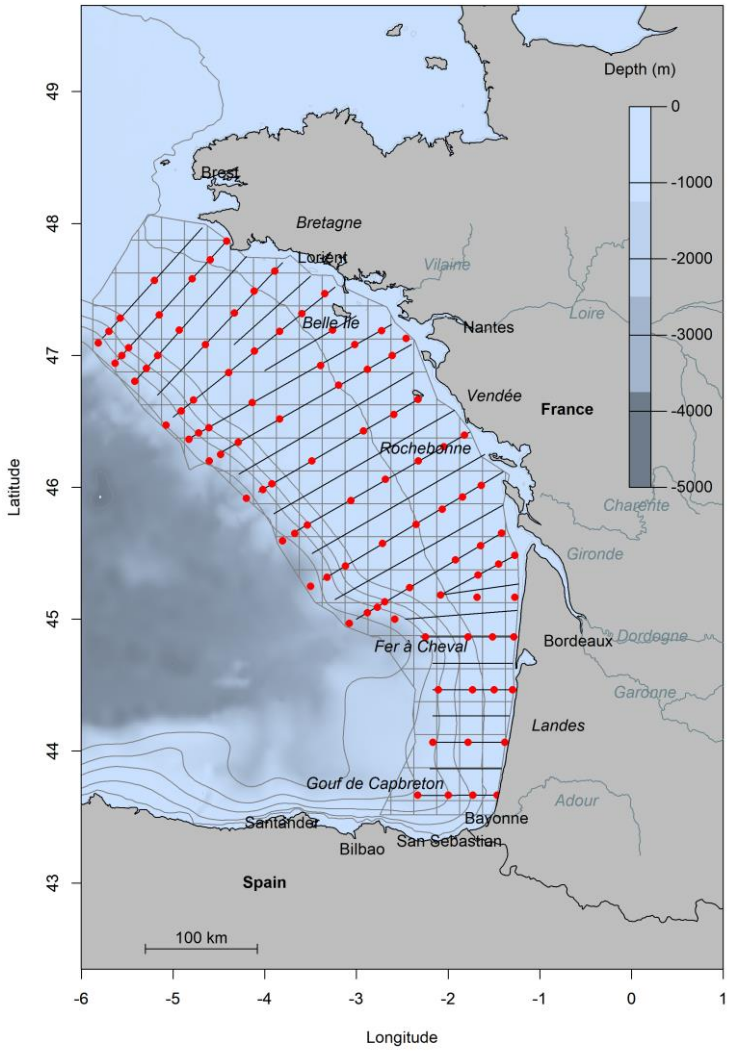
3. Pelgas Pro (complementary to SAHMAS survey)

1. Objectives of the survey
The PELGAS PRO survey is a consort survey conducted by commercial fishermen during the PELGAS survey (cf. description above - SAHMAS). Chartered commercial fishermen have sailed alongside R/V Thalassa during the PELGAS survey in spring (April-May) in the Bay of Biscay since 2007. They have performed pelagic trawl hauls to identify about half of the fish echotraces detected onboard R/V Thalassa. Fishing data collected during the PELGAS PRO survey are used together with acoustic and fishing data collected onboard R/V Thalassa to calculate the anchovy, sardine, horse mackerels, sprat, boarfish, blue whiting and mackerels biomass estimates and information on population structure provided by the PELGAS survey. The survey, considered as a part of the SAHMAS survey, is listed in 2021/1168 Table 1. Until 2022 included, PELGAS PRO will be funded through EMFF article 28. From 2023, PELGAS PRO will integrate the regular data collection and be funded through DCF article 23 EMFAF.

No dedicated annex 1.1 as the data collected respect protocols defined in SAHMAS Annex 1.1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.
The PELGAS and PELGAS PRO surveys are internationally coordinated by the ICES WGACEGG working group. Methods have been validated by WGACEGG and are described in details in the survey protocols manual: https://doi.org/10.17895/ices.pub.7462

Commercial pair trawlers have accompanied R/V Thalassa during the PELGAS survey since 2007, to increase the effort devoted to fish echotraces identification. Catches made on commercial vessels are processed by a trained scientific observer following the same protocol as on R/V Thalassa, and used together with acoustic and fishing data collected onboard R/V Thalassa to calculate the anchovy, sardine, horse mackerels, sprat, boarfish, blue whiting and mackerels biomass estimates and information on population structure provided by the PELGAS survey.



SAHMAS French survey sampling scheme. Black lines: daytime transects, red dots: night-time hydrobiological stations.

Acoustic and fishing data, as well as biomass assessment results are stored in the EchoBase relational database. Acoustic and fishing data are shared within the ICES ACEGG working group. They are being stored in the ICES dedicated database: https://www.ices.dk/data/data-portals/Pages/acoustic.aspx.

Anchovy, sardine, mackerels, horse mackerels, blue whiting and boarfish biomass estimates derived from data collected during PELGAS are provided to ICES stock assessment groups (WGHANSA and WGWIDE).

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The PELGAS and PELGAS PRO surveys are the French contribution to the international Sardine, anchovy, horse mackerel acoustic survey (SAHMAS), covering the Bay of Biscay. The surveys are internationally coordinated within the ICES WGACEGG working group, comprising scientists from Spain, Portugal, France, United Kingdom and Ireland.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Not applicable.

(max 450 words per survey)

4. Langolf TV (additional survey)

1. Objectives of the survey

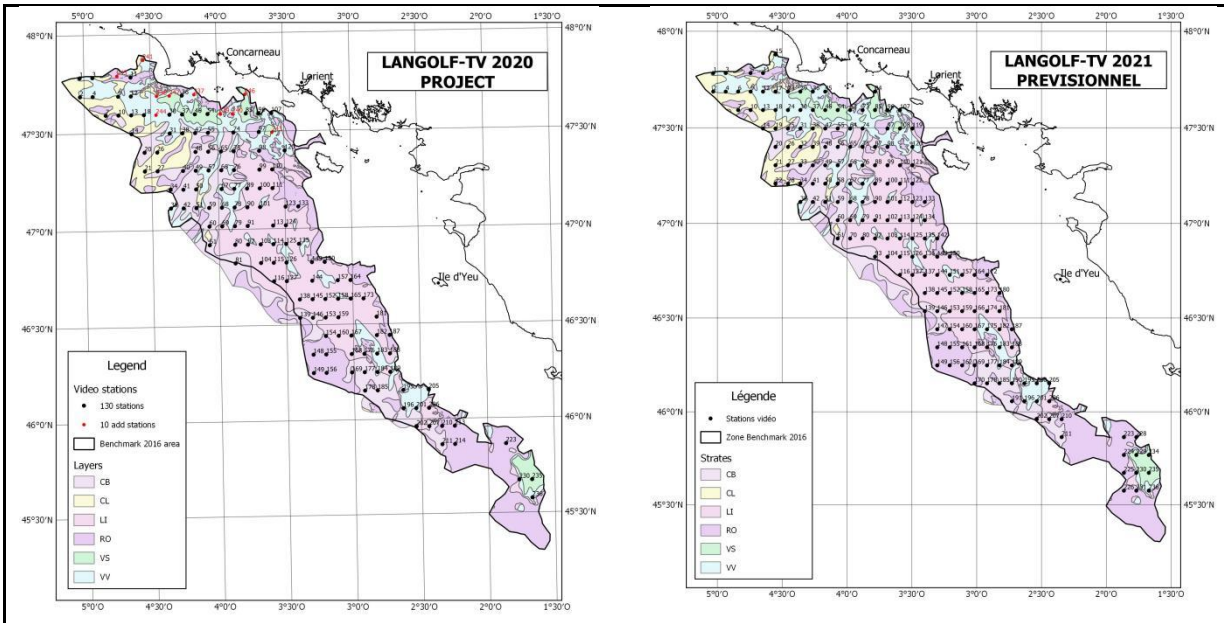
The UWTV survey named "LANGOLF-TV" aims at defining an abundance for Nephrops norvegicus in the Bay of Biscay. This survey is conducted in May. It has been conducted since 2014 aiming to demonstrate the technical feasibility of such a survey in the local context and to identify the necessary competences and equipment for its sustainability. During the first two years, 2014 and 2015, video sampling was associated to a trawl one for the purpose of providing *Nephrops* LFDs by sex and estimating the proportion of other burrowing crustaceans (mainly *Munida*) which can induce bias in the burrows counting.
The surface involving in *Nephrops* is precisely delimited owing two information: (1) on the sedimentary structure of the sea bottom already taken into account during the former LANGOLF trawl survey on years 2006-2013 (5 spatial strata); (2) on the systematic grid of video tracks combined with VMS data for the fishery (data source: National Fisheries Direction; compilation: Ifremer). Sampling of landings and discards (onboard and at auction) has provided yearly dataset since 1987 and mainly since 2003 owing to the monitoring of the European DCF plan and sampled data are included in the overall assessment process.

The 2016's WKNEP benchmark held by ICES validated the UWTV survey and the assessment combining burrows counting and the SCA model for this stock. The change of the stock status from category 3 to 1 implies annual advice instead of the biennial one applied previously.

The survey is not listed in 2021/1168 Table 1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

In accordance with other routinely UWTV surveyed stocks, the sampling protocol applied since 2014 has been a systematic one advantaged by wider spatialized explorations on collected data. A distance of 4.7 nautical miles was retained similarly to the FU22 Smalls Ground surveyed by Marine Institute (Republic of Ireland). From 2016 onwards the survey duration has been longer than previously: 14 effective working days were planned (instead of 10). Thus, it has been allowed to cover for the first time the area contained in the outline of the Central Mud Bank no belonging to any sedimentary stratum: this area known as not trawled due to rough sea bottom concentrate moderate fishing effort targeting *Nephrops* (16164 km² were covered by sampling instead of 11676 km² of the historical five sedimentary strata). A coverage by 180 stations is recommended in order to obtain statistically acceptable precision of estimates for numbers of burrows.



Langolf TV sampling scheme

The survey is performed in May on board R/V Celtic Voyager

Last report is available :
https://www.comite-peches.fr/wp-content/uploads/2020/01/Rapport_complet_LANGOLF-TV_2019_CNPMEM.pdf

3. For internationally coordinated surveys, describe the participating Member States/vessels.
Partnership with the "Marine Institute" (Republic of Ireland) for the specialised research vessel as well as the equipment. The whole task of interpretation, validation and exploitation of results remains under the responsibility of Ifremer.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.
As the project was planned owing to a partnership with the "Marine Institute" one expert scientist and one electronics technician from Ireland join the team. The equipment (sledge, computing hardware, screens, recorders) were provided by the "Marine Institute".

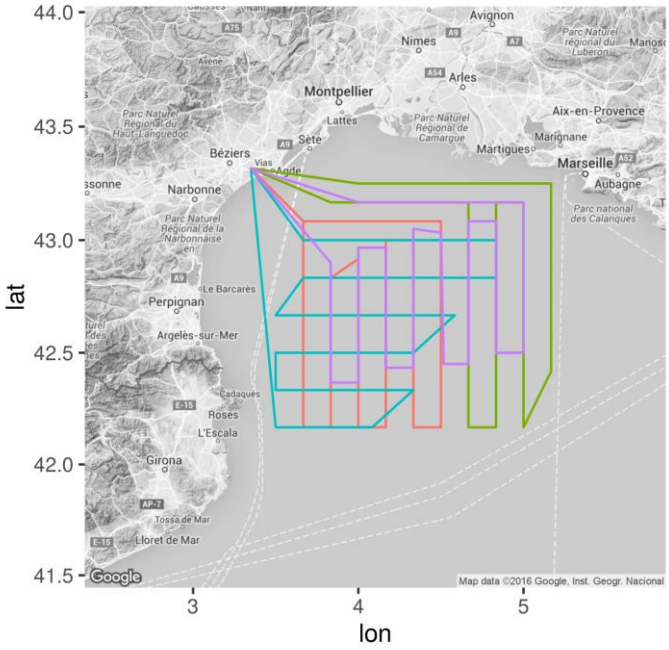
(max 450 words per survey)

5. French Aerial Survey For Bluefin Tuna - FRAER (Additional survey)

1. Objectives of the survey
The survey aims at providing an abundance index of young Bluefin tunas in the Gulf of Lions through aerial observation. Survey runs during August-September. Tuna schools are observed from plane across a maximum of 12 flights per year performing pre-defined routes allowing to provide an index on young Bluefin tunas. This survey has been taking place yearly from 2009 until 2021 without disruption under national fundings. The index provided is currently used in the stock assessment of the eastern Bluefin Tuna stock and also in the Management strategy evaluation, both within ICCAT. Although the survey targets Bluefin Tuna, a large range of megafauna species are also observed (marine mammals) and integrated into the database. The survey is not listed in 2021/1168 Table 1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

Eight to twelve flights are done using pre-defined routes (see figure) that are selected depending on the day and the weather. Along these routes the number of tuna schools (and other marine megafauna) are recorded with a school size estimate, a GPS location and an estimate of the distance to the plane. The data is then used to estimate a density of schools over the Gulf of Lions.



French aerial survey for bluefin tuna (FRAER) sampling scheme.

3. For internationally coordinated surveys, describe the participating Member States/vessels.

No international coordination.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Not applicable.

(max 450 words per survey)

6. Mediterranean international bottom trawl survey - MEDITS (French survey)

1. Objectives of the survey

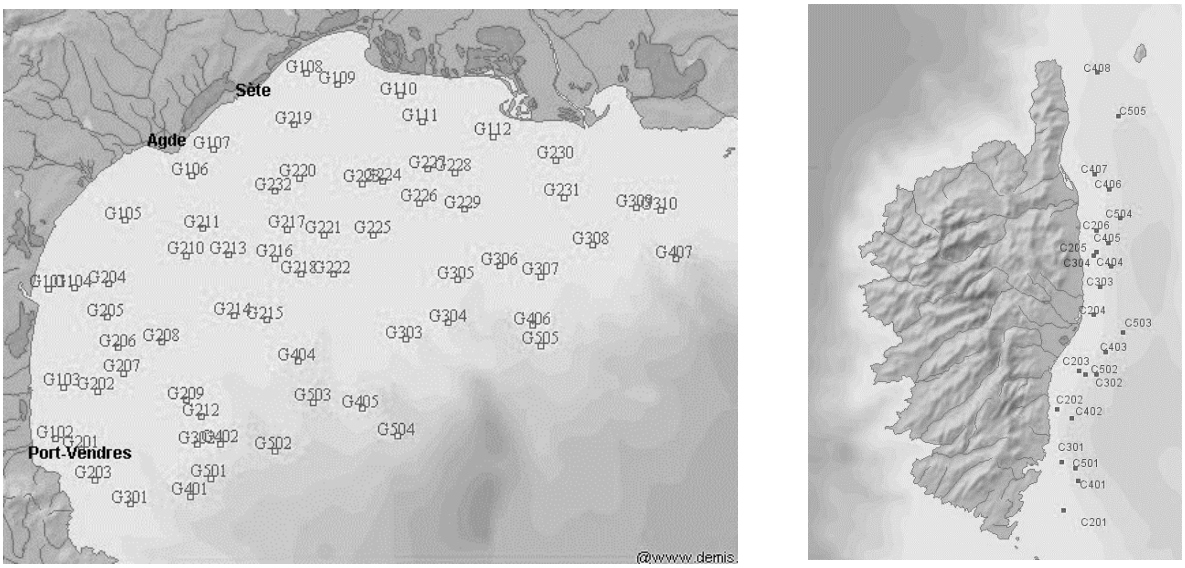
The aim of the MEDITS-FR survey (French component of MEDITS international bottom trawl programme) is to determine the distribution, abundance and length (age) structure of demersal fish and shellfish species in the trawlable areas between 10m and 800m on the East coast of Corsica (GSA 8) and in the Gulf of Lions (GSA 7). The MEDiterranean International bottom Trawl Survey (MEDITS) programme was launched in 1993 at the instigation of the European Commission. It involves participants from all Mediterranean and Black Sea Member States, plus some third countries depending on the year. The survey is listed in 2021/1168 Table 1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The international MEDITS series covers a large part of the Mediterranean and Black Seas.

hyperlink: http://www.sibm.it/SITO%20MEDITS/principaleprogramme.htm

Each year, 88 bottom trawl hauls (respectively 65 in GSA 7 and 23 in GSA 8) are carried out by the research vessel "L'Europe" in late Spring (35 days at sea between May and early July) following a standardised protocol common to all the participant countries. Hauls positions are replicated as far as feasible from year to year, last thirty minutes (one hour >200m) and are coupled with regular measurements of bottom water temperature and salinity. All catches of fish, crustaceans and cephalopods are sorted, counted and weighed, according to the MEDITS standardised protocols. According to these protocols, 84 commercially important species are length measured, and sex and maturity stages are determined. Otoliths are collected for age readings for hake, red mullets (2 species), and also illicii for anglerfish (2 species). Hydrological operations are performed at each trawl station. Litter items in the catch are sorted, counted and weighted and fish samples are collected for research studies (contaminants, diet,..).



MEDITS French survey sampling scheme (Gulf of Lions on the left, eastern Corsica on the right).

The data are validated by being reread and checked on board, where they are recorded in a temporary database. On land, consistency checks are applied to the data using automatic protocols (RoME routines generated by the international MEDITS group). In addition, effort is maintained to improve continuously the quality of the data collected at sea: identification manual for the species caught during MEDITS surveys (2007), photographic atlas of the stages of maturity of the main species (renewed in 2012). Finally the yearly validated data set is uploaded to the "Scientific surveys" module of Ifremer's central database "Harmonie".

The data are used at international level by the MEDITS group. A common exchange format in five tables (TA, TB, TC, TE and TL) was agreed between the data providers but there exist no regional database for raw data. However, the MEDITS group makes data available standardised population indices validated by experts and which reflect the trends observed in populations abundances and catch composition.

Information about the Medits surveys: http://www.sibm.it/SITO%20MEDITS/principaleprogramme.htm

3. For internationally coordinated surveys, describe the participating Member States/vessels.
The survey is coordinated by the MEDITS group. France is the only country covering the gulf of Lions and eastern Corsica. In addition to national data reporting (for use by industry, government agencies and Regions), MEDITS data are also used by GFCM working groups and sub-groups of STECF, e.g. SGMED/EWG.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.
There is no survey cost sharing agreement involving France.

(max 450 words per survey)

7. Pan-Mediterranean pelagic survey - MEDIAS (French survey)

1. Objectives of the survey

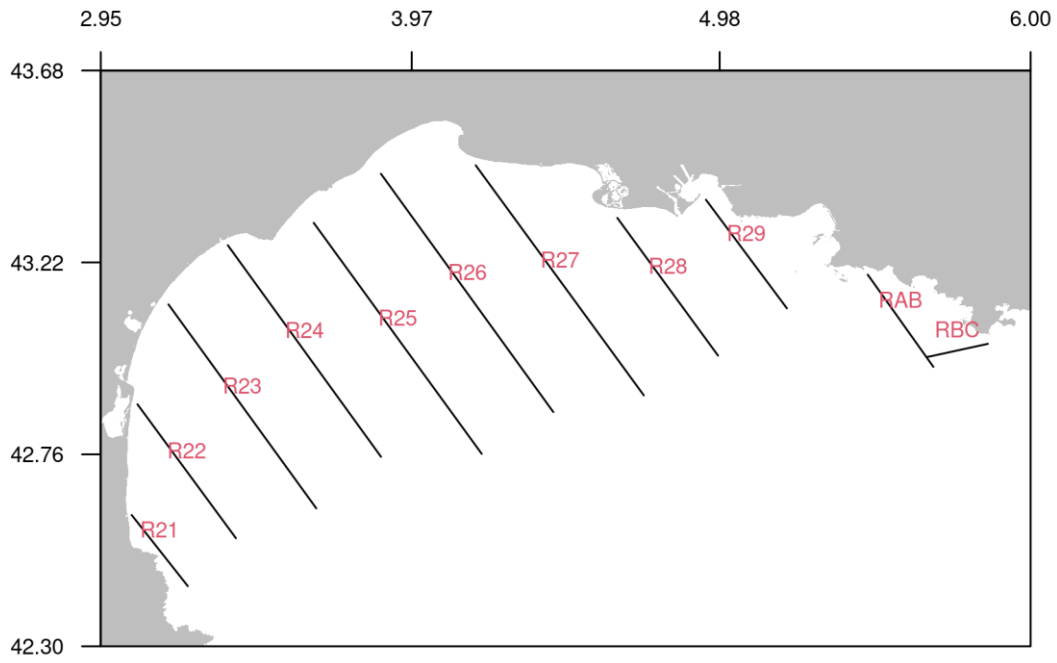
The aim of the French PELMED/MEDIAS survey is to increase our understanding of the pelagic ecosystem in the Gulf of Lions using acoustic transects accompanied by pelagic trawl hauls to identify echo-traces detected, survey is performed in June-July.. In particular it allows us to estimate biomass indices of the main small pelagic species in the Gulf of Lions, as well as their biological characteristics (length- and age-structure, sex ratio, maturity, body condition indices). Those indices constitute the basis of stock assessments for anchovy and sardines (GFCM and STECF). Further, the survey also permits a better characterisation of the spatial distribution of small pelagics both in the water column and geographically. Finally, the monitoring covers the entire ecosystem from physical measurements to seabird and marine mammal observation through to plankton sampling. All protocols are carried out according to the MEDIAS protocol and DCF requirements. The survey is listed in 2021/1168 Table 1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

PELMED surveys started in 1993. In the Gulf of Lion, systematic sampling is performed along 9 parallel and regularly spaced transects (inter-transect distance = 12 nautical miles). From 2008 to 2013, an extension in the North Catalan Sea was conducted to better cover the small pelagics distribution. This extension is no longer conducted since 2016 as Spain now covers the area using the MEDIAS protocol. In replacement, the survey has been extended towards the East (see map below RAB -> RBC) to better cover the sardine habitat.

The protocol is similar to the PELGAS survey in the Bay of Biscay. Acoustic data are obtained by means of echo-sounders (Simrad ER60) and recorded at constant speed of 8 $nm.h^{-1}$. A 3D-echosounder (Simrad ME70) is also now installed and used discriminate schools. The size of the elementary distance sampling unit (EDSU) is 1 nautical mile. Discrimination between species is done both by echo trace classification and trawl composition. Each time a fish trace is observed for at least 2 nm on the echogram, the boat turns around to conduct a ~30 min-trawl at 4 $nm.h^{-1}$ to evaluate species composition and length distribution. While all 5 frequencies are visualized during sampling and help deciding when to conduct a trawl, only the energies from the 38kHz echosounder are used to estimate fish biomass.

Adopting an ecosystem approach, observations and counts of cetaceans and birds encountered on the survey transects are also made. Hydrological stations are performed in the middle of each trawl and at the ends of each transect. This comprises plankton nets, CTD casts, and water sampling through Niskin bottles. Since 2020 a microplastic monitoring with a MANTA net has been carried out for the purposes of the Marine Strategy Framework Directive (MSFD) French legislation.



MEDIAS French survey sampling scheme

The MEDIAS protocol is applied. This guarantees availability of data under the required format, allowing potential use to estimate ecosystem indicators linked to the scientific surveys (codes 1 to 4 of appendix XIII of the technical Decision 93/2010/EU).

Eleven transects totalling around 325 nautical miles of acoustic acquisition are planned, along witch two or three daily trawl hauls coupled with hydrology parameters collection will be performed on echo- detections not exceeding the 200-metre isobath.

The survey protocols manual is available :

http://www.medias-project.eu/medias/website/handbooks-menu/func-startdown/95/

3. For internationally coordinated surveys, describe the participating Member States/vessels.

In addition to national data reporting (for the industry, government agencies and Regions), PELMED data are also used by GFCM working groups and sub-groups of STECF such as SGMED. Further, data are presented and surveys discussed each year at the annual MEDIAS working group.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Not applicable.

(max 450 words per survey)

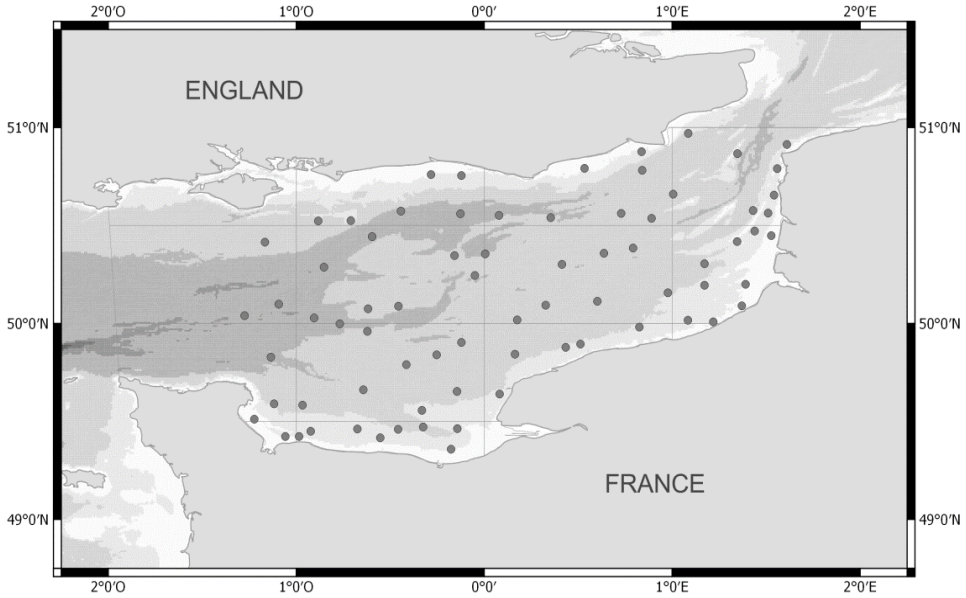
8. Chanel Ground Fish Survey – IBTS_Q4 (French survey)

1. Objectives of the survey

The Channel GroundFish Survey (CGFS) aims at estimating the abundance and distribution of demersal fish stocks, independently of commercial fisheries data, in the ICES area 7d (eastern English Channel). This bottom trawl survey, conducted in October every year since 1988 following a standard protocol, provides data for exploited stocks (total abundance; recruitment index; spatial distribution; maturity; age/size structure). This survey also collects data on non-commercial species and other biological compartments (benthic invertebrates, plankton…) as input to an ecosystem approach to fisheries. The survey is listed in 2021/1168 Table 1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

Since 1988, the ICES area 7d has been sampled annually during 30 days in October following a fixed sampling design with about 88 trawling stations. At the time of the vessel change in 2014 from R/V Gwen Drez to R/V Thalassa, the sampling scheme was optimized and is now composed of about 70 stations, sampled in 16 days. Both the intercalibration realised between the vessels and the optimized sampling scheme have been validated by WGIBTS. CGFS follows the standard protocol[1] and uses the standard bottom trawl "gear A" (GOV 36/47) to conduct 30min tows during day-light. All individuals from the haul are sorted, identified, weighted, counted and measured, according to IBTS standardised protocols. A subset of species is also subject to sex and maturity determination associated to otolith sampling for age reading, in relation with DCF requirements (plaice, sole, cod, whiting, red mullet, pouting, red gurnard, seabass). In addition to fish and cephalopods, benthic invertebrates and gelatinous organisms are also determined, counted and weighed. Litter in the trawl is sorted, counted and weighed at each station and additional biological sampling may be conducted for different purposes (e.g. MSFD requirements, request from ICES working groups, studies on genetics, food web, etc.). Hydro-biological data are gathered from CTD profiles, water sampling through Niskin bottles and zooplankton nets. Fish egg sampling (mostly sardine and horse mackerel eggs) is realised en route using a pumping device associated to semi-automatic identification software. Finally, onboard observers record birds and mammals encountered.



IBTS_Q4 French survey sampling scheme

3. For internationally coordinated surveys, describe the participating Member States/vessels.

1 http://www.ices.dk/marine-data/Documents/DATRAS%20Manuals/Addendum_2_Manual_IBTS_Western_and_Southern_Areas_Revision_III.pdf

The CGFS survey is coordinated by WGIBTS. As such, the data collected during each survey are validated (on board and at land) and formated before being uploaded to the common database DATRAS. Global abundance or biomass indices are computed as well as abundance-by-age indices for some species, to be used in the stock assessment of plaice, red-mullet, seabass, squids, cuttlefish, horse mackerel and elasmobranchs by the ICES working groups WGNSSK WGCEP, WGWIDE, WGEF, WGCSE.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Not applicable.

(max 450 words per survey)

9. Western IBTS fourth quarter (including Porcupine survey) - IBTS_Q4 (French survey)

1. Objectives of the survey

The EVHOE survey (EValuation des ressources Halieutiques de l'Ouest Européen - Assessment of Fisheries Resources in Western Europe) contributes to the Western IBTS 4th quarter surveys in areas 7e-h-7jk-8ab, and is complementary to CGFS in 7d to cover the whole area of IBTS_Q4. The survey covers fish and invertebrate species in the Bay of Biscay and Celtic Sea and provides abundance indices for demersal species (total, recruitment and by age for selected species). Further, the collected data makes it possible to estimate the recruitment level of the several species of commercial interest. The data also contribute to numerous research programmes on the biology and distribution of selected species and on trends of fish and cephalopods populations in the Bay of Biscay and Celtic Sea. In the Bay of Biscay the first survey took place in 1987. In 1997 the survey area was extended to include the Celtic Sea. The survey is listed in 2021/1168 Table 1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

Each year, bottom trawling is carried out from mid-October to early December (45 days, 155 stations, R/V Thalassa) using standard protocols (sampling plan, fishing gear, catch analysis protocol). The survey design was recently revised to become a stratified systematic unaligned design with fixed stations. The new designed was approved by WGIBTS and is implemented from 2016. For each haul, all fish and cephalopods are identified and measured. For several commercial species otolithes are sampled for age reading; species composition and abundance of benthos is regularly observed. Biological parameters for commercially exploited species are collected in accordance with the sampling plan designed and coordinated by the ICES IBTS working group. Temperature and salinity profiles are collected for each haul. Sampling plans for monitoring zooplankton, benthos and litter items, as well as bird and mammal observations have been implemented in recent years (table 1H of the 2018 annual report).

The main species relevant for stock assessment are megrim, black and white anglerfish, hake, haddock, red gurnard and to a lesser extent cod, greater forkbeard, mackerel, and various others rays (especially thornback and cukoo rays) and sharks (*e.g.* dogfishes).

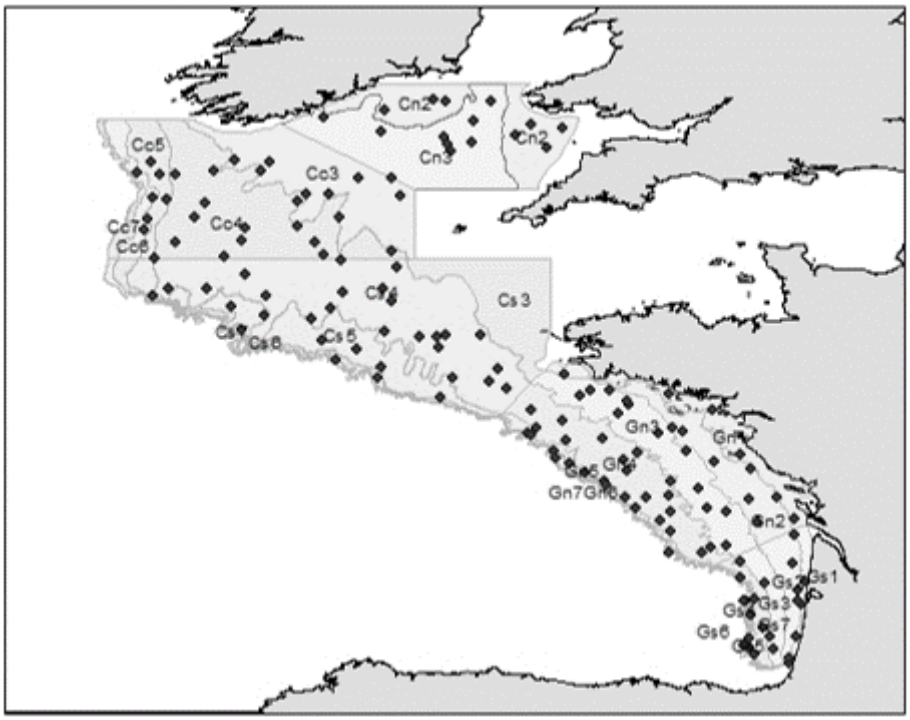
This series is also coordinated internationally by the ICES IBTS Working group, with standardized protocols that can be found on the ICES data portal (DATRAS).

North-East Atlantic IBTS surveys manual:

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

EVHOE manual (summary):

http://datras.ices.dk/Documents/Manuals/Manuals.aspx



IBTS_Q4 French survey sampling scheme

Data quality checking and data storage follow the same procedures as for North-Sea IBTS (see previous section). The validated data are uploaded to the "Scientific surveys" module of Ifremer's Harmonie database. A data set is also transmitted to ICES (Datras database) in the stipulated formats.

The collected information contributes to the production of survey-derived ecosystem indicators (codes 1 to 4 of Appendix XIII of the technical Decision).

3. For internationally coordinated surveys, describe the participating Member States/vessels.

No other countries participate. The survey is internationally coordinated by WGIBTS.

In addition to national reporting purposes (for use by industry, government agencies and Regions), the main users of EVHOE data are the ICES working groups assessing stocks in the North Eastern Atlantic, the Celtic Sea and the Bay of Biscay: Working Group for the Bay of Biscay and the Iberian Waters Ecoregion (WGBIE), Working Group for the Celtic Seas Ecoregion (WGCSE) and Stocks, Working Group on Elasmobranch Fishes (WGEF), Working Group on Widely Distributed Stocks (WGWIDE) Working Group on Biology and Assessment of Deep-sea Fisheries Resources (WGDEEP), Working Group on Cephalopod Fisheries and Life History (WGCEPH), in addition of course to WGIBTS.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Not applicable.

(max 450 words per survey)

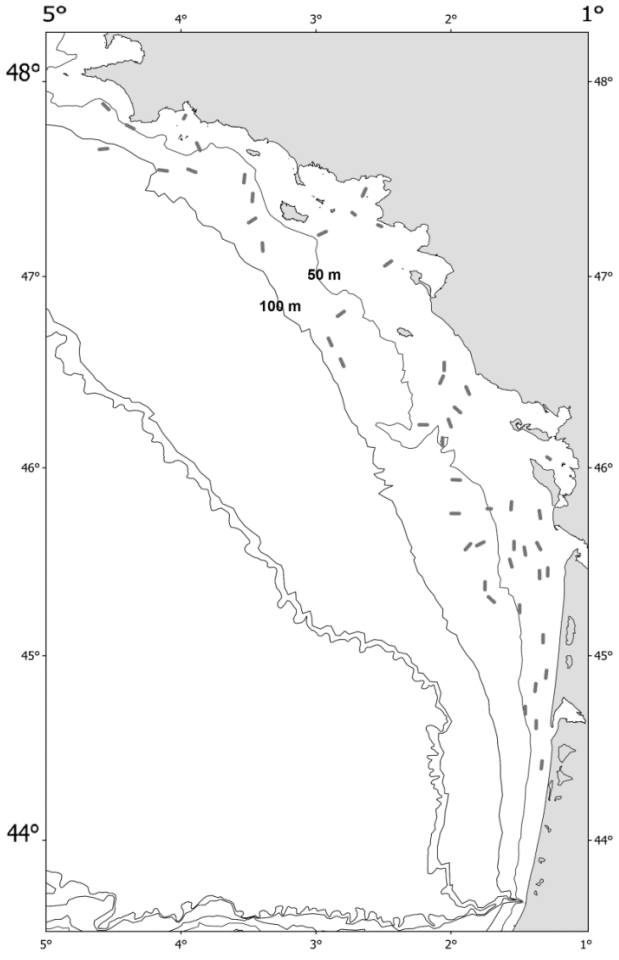
10. Bay of Biscay Demersal Resources Survey – ORHAGO_Q4_FRA (French survey)

1. Objectives of the survey

The Bay of Biscay ORHAGO beam trawl survey aims to collect data on composition, distribution and change in relative abundance of benthic fish fauna on the continental shelf (<100m) on a yearly basis (quarter 4). Information are collected on length frequency for all the fish, with biological information (age, maturity) for some species. The main target species is sole, other abundant commercial species include (top 10 by decreasing numbers/hour in 2015): Norway lobster, hake, brown shrimp, cuttlefish, horse mackerel, common whelk, common spider crab, small-spotted catshark, greater weever and common prawn. Since 2013, the benthos is exhaustively sampled for all the hauls (for determination at the laboratory). The survey is listed in 2021/1168 Table 1.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

The ORHAGO survey was launched in 2007 to fulfil the need of a fishery independent abundance index for the Bay of Biscay sole stock which has been pointed out since many years by successive ICES WG and their review groups and as well as in ICES advice.
Since 2011, in accordance with ICES agreed gear for flatfish abundance surveys, the gear is 4m-beam trawl with chain mat, 50mm mesh in the net et 40 mm mesh in the cod-end.
The sampling plan was designed to ensure full coverage of the sole habitat in the Bay of Biscay during a period (November-December) for which fish behaviour and distribution was suitable for obtaining an unbiased abundance index (young fish move offshore when coastal waters become colder and before the concentrations of the spawning season). The sampling design is a systematic sampling with 49 reference stations. The design was validated in 2013 by the ICES WGBEAM working group.



ORHAGO_Q4_FRA French survey sampling scheme

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The ORHAGO survey is coordinated by the ICES WGBEAM working group.
WGBEAM has approved the calculation method for the Bay of Biscay sole stock abundance index at its 2013 meeting (daylight hauls for a set of reference stations). The same year, an interim benchmark approved the inclusion of the ORHAGO survey in the Bay of Biscay sole stock assessment. Since 2013, the ORHAGO survey has consequently been used to assess the status of this stock (WGMMM in 2013, WGBIE since 2014).

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Not applicable

(max 450 words per survey)

11. Blue Whiting Survey– IBWSS

1. Objectives of the survey

The IBWSS is carried out annually in March/April in the North Sea and 2 EU countries, the Netherlands and Ireland, participate. The survey is listed in 2021/1168 Table 1. The continuity of the previous survey design is guaranteed by participation in the coordinating survey group (WGIPS).
The survey aims to determine the distribution and abundance at age and length of the Northeast Atlantic blue whiting stock during the spawning season to the west of Britain and Ireland.
France contributes to this survey only through financial agreements.

2. Description of the survey design and methods used in the survey for each type of data collection as listed in Table 2.6 for this specific survey.

During the survey transect-wise acoustic echosounder measurements are done. In addition, trawl hauls are made to identify the species composition of the acoustic recordings. Hydrographical data are collected on regular intervals. The complete sampling procedure is defined in the ICES Manual for International Pelagic Surveys (IPS) chapter 2.1.1.
See Annex 1.1 in Ireland and Netherlands National Work Plan.

3. For internationally coordinated surveys, describe the participating Member States/vessels.

The survey is coordinated by the ICES Working Group on International Pelagic Surveys (WGIPS) and performed in collaboration with research vessels from Ireland, Faroe Islands, Russia, and Norway.
The disaggregated survey data (hydrographic, biological, & acoustic) are stored in the PGNAPES database hosted by the Faroe Marine Research Institute. The blue whiting spawning stock estimate is used as a tuning index by ICES WGWIDE to determine the size of the population.

4. Where applicable, provide more details on the type of participation and/or threshold agreement applied.

Task sharing applies. The IBWSS is carried out by two EU MSs, and three non EU MSs, each contributing with its own vessel. Furthermore, scientists from Denmark, Germany and UK participate in the survey on board of the Dutch vessel. Cost sharing applies: the operational costs of the vessels are shared by EU MSs applying an allocation key proportional to national share of the EU TAC.
France contributes to this survey through two dedicated financial bilateral agreements with Ireland and the Netherlands (to be signed by 2022).

Text Box 3.1: Fishing activity variables data collection strategy

General comment: This text box fulfils Article 5 (2)(c), Article 6 (3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 3.1 of the EU MAP Delegated Decision annex. It is intended to describe the method used to derive estimates on representative samples where data are not to be recorded under the Control Regulation (EC) No 1224/2009 or where data collected under Regulation (EC) No 1224/2009 are not at the right aggregation level for the intended scientific use. Text Box 3.1 should be filled only in case complementary data collection is planned

French fishing activity data are calculated for all the French fleet register' vessels and usually derived from data collected under the Control Regulation (EC) No 1224/2009 *(Logbooks and for less 10m' vessels monthly declarative forms (coastal logbooks), sales note data and geolocalisation data (inc. VMS data))* combined by a cross-validation tool (SACROIS[1]).

Complementary data collection is implemented:

A/ **for the French fishing fleet less than 12 meters length operating in the Outermost regions (French Guiana, Guadeloupe and Martinique, La Réunion and Mayotte)** for which the coverage and precision of their available declarative control regulation data is evaluated as insufficient/incomplete to meet the end-users data needs (e.g. DCF requirements) and are judged insufficient and unreliable to estimate their fishing activity data. Consequently complementary on-site sampling data are collected *(Complementary on-site sampling of fishing trips (ObsDEB, catch assessment survey), see Annex 1.2 for information on the sampling scheme – corresponding to data source 'Questionnaires' in table 3.1)* and calculation of their reference fishing activity' estimates is applied on this basis. For these fleets the following fishing activity variables *(related with fishing capacity)*: "Number of vessels", "GT", "kW" and "Vessel Age" are directly estimated by fleet segment from the fishing activity calendar survey *(see below in D/ and Annex 1.2 on Annual fishing activity calendar survey).*

B/ **for the French fishing fleet less than 12 meters length operating in the supra-region Mediterranean** for which the coverage and precision of their available declarative control regulation data is evaluated as insufficient/incomplete to meet the end-users data needs (e.g. DCF requirements) but are judged sufficient and reliable to estimate their fishing activity data. Consequently a re-evaluation methodology on the basis of the annual fishing activity calendars survey *(see below in D/ and Annex 1.2 on Annual fishing activity calendar survey)* is applied to calculate their reference fishing activity' estimates *(details about the re-evaluation methodology applied is described in the 9th IFOMC proceedings p°105-108, https://ifomcvigo.com/wp-content/uploads/2018/08/proceedings-9th-ifomc.pdf)*

C/ for all the French fishing fleet and **to better estimate** following fishing activity variables regarding **passive gears characteristics: "Number of nets(m) * soak time (days)", "Number of nets / Length", "Number of hooks, Number of lines" and "Numbers of pots, trap"**. Indeed quality of the available declarative control regulation declarative data on these specific information proved to be insufficient to reach DCF requirements. Consequently complementary passive gear characteristics information are collected thanks to the annual fishing activity calendars survey *(see below in D/ and Annex 1.2 on Annual fishing activity calendar survey)* completed by information available also through scientific observer on-board sampling *(see annex 1.1 for information on the sampling scheme ObsMER, for French fishing fleet operating in continental France)* or through complementary on-site sampling *(see above A/ and Annex 1.2 on Complementary on-site sampling of fishing*

trips (ObsDEB, catch assessment survey), for French fishing fleet less than 12 meters operating in the Outermost regions) with the aim to cover at least 5% of the French fleets' passive gear characteristics *(for the Fleet not covered by the on-site sampling, see above).*

D/ for all the French fishing fleet and **to better characterize the French fishing fleets and their fishing activity** ; an annual fishing activity calendar survey (corresponding to data source 'Other' in table 3.1) is conducted by fishing observers yearly in France on the basis of preliminary documentation provided by available declarative control regulation declarative data. It covers the whole of the reference population *(also vessels with no available data)*. Detailed information on the survey could be found in the Annex 1.2. Such surveys provide information on the part of fishing activity not included in available declarative data *(completeness check)* and also the basis, if necessary, to re-evaluate available fishing activity data estimates (*in case of incomplete data, see above)*. They constitute also an input each year for the typological classifications of vessels by fleet and a description of their metiers which in return makes also possible the definition of sampling plans to structure the routine data collection actions. They are also used to allocate metiers to each fishing trip and constitute the exhaustive basis for doing estimation based on the complementary on-site sampling data *(see above)*. Finally, some passive gears characteristics information are also collected during the survey with a minimum of 5% of the French fleet surveyed *(see above)*.

Finally, specific data collection is applied for **"Tropical Tuna Purse Seiners and Longliner"** which is not covered by sampling scheme described above *(covering following segments "IWE" – "Purse seiners 40 m or larger" and "Vessels using hooks 24-< 40 m").* Detail about this specific data collection could be found in Annex 1.2.

[1] *SACROIS (https://sih.ifremer.fr/Debarquements-effort-de-peche/Sacrois) is a cross-validation tool for the fisheries statistics, aiming at providing the best possible fishing statistics data by cross-checking available data from the different declarative control regulation sources, as demanded in article 145 of the EU control Regulation (EC Reg. 404/2011). The application is crossing information, at the most disaggregated level, from the fishing fleet register, logbooks and coastal logbooks, sales notes data, geolocalisation data and the scientific census of annual fishing activity calendars, in order to build the most accurate and complete dataset compiling French fleet' fishing trips with their associated features (dates, fishing area, metier, gear and mesh size, total weight and value of landings by species). The application verifies and controls the different sources of data, with the aim of displaying validated and qualified landings per species and effort data series. The application provides also several quality indicators and evaluates the completeness of the data flows. A specific algorithm is included into SACROIS to estimate the value of landings based on sales note data available (sometimes directly deducted from them) or estimation of an average price. SACROIS includes also the allocation of a single metier to a fishing trip (see detailed methodology explained in 'Anonymous, DCF metier workshop report, 2018', Annex5 p°75 - 87 https://datacollection.jrc.ec.europa.eu/documents/10213/891027/2018_Workshop_DCF+Metiers.pdf/6b928c8a-c2ac-4507-840c-98155e0f07d9?version=1.0).*

Text Box 3.2: Fishing activity variables data collection strategy (for inland eel commercial fisheries)

General comment: This text box fulfils Article 5(2)(c), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter II point 3.2 of the EU MAP Delegated Decision annex. It is intended to describe the methods and data sources used to estimate fishing capacity, effort and landings data.

For marine fishermen :

Effort, capacity and landings data are collected through mandatory declarations by fishermen, which are recorded in the SACAPT database for marine fishermen. Fishing trip number, fishing areas (at EMU level), fishing days, gears used, stages fished are recorded. Once a year the data for the year n-1 and n go through a validation process to check the consistency of the recorded data. Within this framework, certain data can be checked and modified (correction made) thanks to the fishing licences (authorised area and stage), the fishing opening periods and the knowledge of experts. In some cases, a return to the paper mandatory report can be made.

In France, in the Channel and Atlantic ocean area, licences are provided to fishing companies authorising them to fish diadromous species or in estuaries. For each licence, specific fishing rights can be allocated. There are 5 different specific fishing rights: glass eel, yellow eel, silver eel, salmonids, other diadromous species and estuarine resources. For the same licence, several vessels can have the same specific fishing right but in most cases only one vessel is carrying out the specific fishing at a time. For the Mediterranean Sea, there is glass eel fishery ban and no licence for the variety of species listed above. However, eel fishing is regulated by a Framework Order creating a Fishing Regional Authorisation for professional eel fishing in the continental Mediterranean. It allows fishing for yellow and/or silver eels and sets out the conditions for access to the FPA. The following table details the specific fishing rights and the FPA by EMU and by stage for the last 3 years.

	Glass eel			Yellow eel			Silver eel		
EMU	2018	2019	2020	2018	2019	2020	2018	2019	2020
Rhin	0	0	0	0	0	0	0	0	0
Meuse	0	0	0	0	0	0	0	0	0
Artois-Picardie	10	11	9	0	0	0	0	0	0
Seine-Normandie	12	12	11	7	6	7	0	0	0
Bretagne	72	73	72	15	15	16	0	0	0
Loire et côtiers vendéens	185	181	178	56	56	60	0	0	0
Garonne-Dordogne-Charente	142	146	147	149	154	147	0	0	0
Adour	37	37	35	23	23	22	0	0	0
Rhône-Méditerranée	0	0	0	213	215	203	213	212	205
Corse	0	0	0	10	12	13	9	12	13

In France, according to the FAO categorisation, glass eels are fished with miscelleneous gears (often pushnets and scoopnets), yellow eels with Trap and Hooks and lines gears (pots, fyke nets, barriers and longlines) and silver eels with Trap gears (Pots, fyke nets, stow nets and barriers). In a data call, only indicators by gear category (first tier, table 1, He, P., Chopin, F., Suuronen, P., Ferro, R.S.T and Lansley, J. 2021.Classification and illustrated definition of fishing gears. FAO Fisheries and Aquaculture Technical

Paper No. 672. Rome, FAO. https://doi.org/10.4060/cb4966en) can be provided (only stratum that can be validated).

For freshwater fishermen:

Since January 2020, remote reporting is mandatory, every fisherman reports :

- the day of the capture
- the emu (deducted from the fishing area)
- the gear used
- the size and/or weight for yellow and silver eels
- weight and destination (consumption or restocking) for glass eels

To limit input errors, the application proposes referentials or nomenclatures whose values are accessible in choice lists.

The management services create the fishermen and their rights in Cesmia, which makes it possible to count the number of eel licenses (yellow, silver or elvers) issued and the declaration rate. The fluidity of the system will make it possible to reach the target of 100% of reporting fishermen by 2022. In addition, the control operations, also facilitated, will increase the declaration rate.

At the end of the different seasons, an analysis of the data before distribution allows the quality of the database to be improved (identification of input errors, inconsistencies, etc.). The subject is sufficiently well defined upstream so that the exercise can be rapid and reliable, and it is planned in 2022 to carry out the work of returning the declarations by associating the fishermen who will thus be able to provide answers to the questions that arise.

(max. 900 words)

Text Box 4.2: Incidental by-catch of sensitive species

Region : North Sea and Eastern Arctic

General Comment: This text box fulfils Article 5(2)(a) and (b), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2 point 4.1 of the EU-MAP Delegated Decision annex. This text box complements Table 2.5.

Data on incidental by-catch of sensitive species are collected through three different means :

- Observers at-sea (Obsmer – see Annex 1.1) : Obsmer programme includes an exhaustive observation of all PETS species (mammals, birds, reptiles, fishes) bycaught during :
    - All sampled fishing operations for mammals, birds, reptiles
    - All sampled fishing operation for protected fishes

  For birds : observer have to report it, indicating species name, geographical position, age (if possible), how animal was released (alive, dead, in which state). *For mammals* : observer have to report it, indicating species name, geographical position, length, weight, how animal was released (alive, dead), if any mark of fishing gear is present and which type. Observer have to put a caudal bracelet with a unique identification number on all mammals bycaught.

- Voluntary or mandatory reports by fishermen : Report of bycatch of mammals is mandatory in France since 2019, and recorded through logbooks. Report of bycatch of other protected species (birds, reptiles, fishes) is not mandatory for fishermen in metropolitan France. By September 2022, mandatory report of all bycatch of birds, reptiles and mammals will be in force. Declaration will be facilitated for small vessels by a phone application "Visiocaptures" which is aimed to replace paper logbooks.

- On-shore samplings "EOS" and "Obsventes" for elasmobranches' species (see Annex 1.1) : species listed as PETS and present during visits in auctions are measured for length.

Additional information on planning the observation of incidental catches of sensitive species (if already filled in in Annex 1.1, please indicate where it can be found):

- Has an assessment of the relative risk of bycatch for the different gear types/metiers taken place and been taken into account for the sampling design?

Obsmer sampling plan is designed according to Obsmer objectives and takes into account fishing effort. However, as Obsmer is not designed specifically to observe bycatch of PETS, the sampling plan does not include a risk-analysis of bycatch per segment.

- What are the gear types/metiers that present the highest risk of bycatch per species/taxa of PETS in a given region?

No specific analysis has been yet taken to identify high-risk gear or metier at national level in the area. However such an analysis will be conducted in metropolitan France from 2022 to 2026.

Report on interactions between turtles and fisheries is available here, but no specific gear was identified as high-risk in Channel and North Sea area : https://plateforme-recherches-spm.com/wp-content/uploads/2021/04/Lu.pdf

- What are the methods to calculate the observation effort?

No dedicated observation effort. The total envelope of trips to sample in a year by Obsmer programm (N ~ 1200 for all Metropolitan France) is spread across all strata (sampling frames of fleets) based on the volume of landings or Regulatory prerequisite, when exists, for each of the fleets.

- Does the sampling design and protocol follow the recommendations from relevant expert groups? Provide appropriate references. If there are no relevant expert groups, the design and protocol have to be explained in the text.

Yes – dedicated pilot studies are conducted in Bay of Biscay (see Textbox 4.2 North East Atlantic). Ascobans recommandation : https://www.ascobans.org/sites/default/files/document/ascobans_res8.5_rev.mop9_bycatch.pdf

ICES WGBYC : https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=36915

Additional information on observer protocols (if already filled in in Annex 1.1, indicate where it can be found):

- Does the on-board observer protocol contain a check for rare specimens in the catch at opening of the cod-end? If YES is the observer instructed to indicate if the cod-end was NOT checked in a haul?

Yes and the observer reports the criteria sampled for retained part, sampled for discards, sampled for all catch fractions or not sampled for each haul of the trip

- In gill nets - and hook-and-line fisheries: does the on-board observer protocol instruct the observer to indicate how much of the hauling process has been observed for (large) incidental bycatches that slip out of the net?

Since the PETS observation is a supplementary task given to the observer on board, there is a high risk that specimen slipping out of the net is not witnessed.

- In large catches: does the protocol instruct to check for rare specimens during sorting of the catch (i.e. at conveyor belt)? Is the observer instructed to indicate what percentage of the sorting or hauling process has been checked at "haul level"?

Yes, all large specimen (rare or not rare) have to be extracted from the whole catch and sampled before taking a random fraction of the remaining catch for the usual sampling. At haul level, the observer reports on the sampled percentage of the whole the catch, this value being used for raising purpose.

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Region : North East Atlantic

General Comment: This text box fulfils Article 5(2)(a) and (b), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2 point 4.1 of the EU-MAP Delegated Decision annex. This text box complements Table 2.5.

Data on incidental by-catch of sensitive species is collected through three different means under DCF dedicated EMFAF fundings :

- Observers at-sea (Obsmer – see Annex 1.1) : Obsmer programme includes an exhaustive observation of all PETS species (mammals, birds, reptiles, fishes) bycaught during :
    - All sampled fishing operations for mammals, birds, reptiles
    - All sampled fishing operation for protected

  For birds : observer have to report it, indicating species name, geographical position, age (if possible), how animal was realeased (alive, dead, in which state). *For mammals* : observer have to report it, indicating species name, geographical position, length, weight, how animal was released (alive, dead), if any mark of fishing gear is present and which type. Observer have to put a caudal bracelet with a

unique identification number on all mammals bycaught.

Reinforced Obsmer programme is setted up since 2018 from December to April to closely monitor bycatch of common dolphin in the Bay of Biscay. This reinforced sampling targets fisheries identified as high-risk (currently pelagic trawlers, and netters), but sampling protocol is identical to Obsmer protocol (see Annex 1.1). Dedicated strata are setted up for lot 2 and 3 to adapt the sampling scheme to the structuration of the fleet to observe. Effort of observation is determined depending on the risk-analysis performed using observation data collected in the area the preceding years.

- Voluntary or mandatory reports by fishermen : Report of bycatch of mammals is mandatory in France since 2019, and recorded through logbooks. Report of bycatch of other protected species (birds, reptiles, fishes) is not mandatory for fishermen in metropolitan France. By September 2022, mandatory report of all bycatch of birds, reptiles and mammals will be in force. Declaration will be facilitated for small vessels by a phone application "Visiocaptures" which is aimed to replace paper logbooks.

- On-shore samplings "EOS" and "Obsventes" for elasmobranches' species (see Annex 1.1) : species listed as PETS and present during visits in auctions are measured for length.

Other on-board observation programs dedicated to bycatch observation in specific areas will also be launched during 2022-2024, but will **not be funded by EMFAF/DCF**, but through other EMFAF or national fundings. Goal is to integrate these observations into DCF reporting and data provided to end-users – however, efforts are still undergoing to ensure that this integration will be feasible in future years :

- Experiment on REM in the Bay of Biscay : France is also experimenting remote electronic monitoring to investigate on bycatch of common dolphin in the Bay of Biscay (Obscame project) : 5 vessels were equipped with cameras during winter 2021. 15 more vessels will be equipped during winter 2022. This project is funded by EMFF – article 39, but not by data collection measure. This project is leaded by French Biodiversity Office (OFB) with the cooperation of volunteer fishermen and with Ministries in charge of ecology and fisheries.
- National plan of action for Balearic shearwater : Regard to the national plan of action for Balearic shearwater, on-board observers is scheduled on long-liner in pilot areas in 2021 and 2022 in the Gulf of Lion (Mediterranean area) and in the bay of Biscay and the marine nature park of Iroise. A new area will be covered by on-board observer on the same interaction in western channel (Saint-Brieuc bay area). These projects are funded for some of them by EMFF (article 40) in MPA and by national funding.
- Risk analysis on gear interaction in Natura 2000 and high risk areas : Several projects will be launched until 2025 to perform risk analysis on gear interaction with birds, mammals, turtles and diadromous fishes. They aim to improve the characterization of the interaction between species and gears under the deployment of the fisheries risk analyses which is required under the Nature Directive (DHFF and DO), under the implementation of the CFP (reduction and if possible elimination of bycatches) and under the MSFD. These projects will be launched in Natura 2000 area and in identified risk sector (defined by risk mapping combining data from protected species distribution, distribution of fishing effort and information concerning interaction between species and specific gears – bycatches exposition risk matrix) and will collect complementary data on bycatch of protected and endangered species in these areas. These projects, funded by EMFF – article 40, are based on observers at sea. Protocol used will be compatible with Obsmer procotol, and should allow for bancarisation of datas into Harmonie database. However, duration and intensity of observation will vary depending on the project.

Additional information on planning the observation of incidental catches of sensitive species (if already filled in in Annex 1.1, please indicate where it can be found):

- Has an assessment of the relative risk of bycatch for the different gear types/metiers taken place and been taken into account for the sampling design?

Regarding Obsmer programme :

- Regular Obsmer sampling plan is designed according to Obsmer objectives and takes into account

fishing effort. However, as Obsmer is not designed specifically to observe bycatch of PETS, the sampling plan does not include a risk-analysis of bycatch per segment.

- Obsmer program is reinforced specifically in the Bay of Biscay from December to April : the sampling scheme complements regular Obsmer program conducted all year long. This reinforcement allows complementary observations in high-risk fisheries (currently pelagic trawlers, and netters). Danish seiners will be added to this reinforced Obsmer program during winter 2021-2022.

Regarding Natura 2000 area and identified risk sector :

In line with the European Birds Directive and the Habitats, Directive, the Environment Code (Article L. 414-4) stipulates that commercial maritime fishing activities carried out within a Natura 2000 site must be subject to a risk analysis in order to reach the conservation objectives (for species and habitats).

With reference to these same directives, the action plans of the façade strategic documents (DSF) (settled under MSFD) also provide for a risk analysis for bycatches of cetacean, birds and turtles and for eight diadromous fishes at the scale of metropolitan waters.

The OFB is drafting the methodological framework for carrying out these species analyses on behalf of the ministries in charge of agriculture and the environment.

The assessment of the risk of catches of these protected species will be carried out from 2022 onwards and its results will be used to reinforce observation systems in identified risk sectors.

- **What are the gear types/metiers that present the highest risk of bycatch per species/taxa of PETS in a given region?**

Common dolphin in the Bay of Biscay :

High-risk gear analysis for common dolphin in the Bay of Biscay has been performed by PELAGIS observatory : https://www.frontiersin.org/articles/10.3389/fmars.2021.617342/full.

This studies identifies the following fisheries as high-risk for bycatch of common dolphins : French midwater trawlers, French Danish seiners, French gillnetters, French trammel netters, Spanish bottom trawlers, and Spanish gillnetters.

Other species :

In view of the "protected species" risk analyses planned from 2022, risk matrix based on scientific literature and available data have been produced for birds, turtles, diadromous fishes and mammals and regarding the different types of gear. National French experts produced this matrix (MNHN for turtles, GISOM/OFB for birds, UMS Partinat/OFB for diadromous fishes and PELAGIS, contribution pending, for marine mammals). These matrix are being finalised for the end of 2021 as part of the work on the method. They will indicate the level of risk interaction for each species (or group of species) with the different gears, separated in 4 levels, as followed, in the French fisheries context :

1. Bycatches *a priori* non-existent or exceptional
2. Rares bycatches and should not " a priori" assessed
3. Bycatches to be assessed
4. Bycatches for priority assessment.

Global analysis of risk will continue on the whole period 2022-2026.

- What are the methods to calculate the observation effort?

Regarding Obsmer programme :

In 2020, during reinforced sampling, number of observations was set to allow observation of 5% of days at sea for the targeted fisheries during winter period. Methodology to calculate observation effort may evolve yearly, depending on national risk-analysis and on recommendations provided by WGBYC and RCG.

Regarding Natura 2000 area and identified risk sector :

To be determined in 2022-2023

- Does the sampling design and protocol follow the recommendations from relevant expert groups? Provide appropriate references. If there are no relevant expert groups, the design and protocol have to be explained in the text.

Yes – dedicated pilot studies are conducted in Bay of Biscay. Ascobans recommandation : https://www.ascobans.org/sites/default/files/document/ascobans_res8.5_rev.mop9_bycatch.pdf

ICES WGBYC : https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=36915

Additional information on observer protocols (if already filled in in Annex 1.1, indicate where it can be found):

- Does the on-board observer protocol contain a check for rare specimens in the catch at opening of the cod-end? If YES is the observer instructed to indicate if the cod-end was NOT checked in a haul?

Yes and the observer reports the criteria sampled for retained part, sampled for discards, sampled for **all catch fractions or not sampled for each haul of the trip**

- In gill nets - and hook-and-line fisheries: does the on-board observer protocol instruct the observer to indicate how much of the hauling process has been observed for (large) incidental bycatches that slip out of the net?

Since the PETS observation is a supplementary task given to the observer on board, there is a high risk that specimen slipping out of the net is not witnessed.

- In large catches: does the protocol instruct to check for rare specimens during sorting of the catch (i.e. at conveyor belt)? Is the observer instructed to indicate what percentage of the sorting or hauling process has been checked at "haul level"?

Yes, all large specimen (rare or not rare) have to be extracted from the whole catch and sampled before taking a random fraction of the remaining catch for the usual sampling. At haul level, the observer reports on the sampled percentage of the whole the catch, this value being used for raising purpose.

Accidental catch of diadromous fishes in freshwater :

For freshwater fisheries for shad, lamprey and salmon (but more generally for all species) any incidental capture of a specimen will result in it being reported as a capture, unless it is released immediately. Any capture of a species not authorised for fishing must be subject to immediate release of the specimen. Incidental catches are therefore not reported separately. However, management measures exist to limit the fishing of these species. On the Adour, for freshwater, an approach by fishing time (number of trips) and not by quota is used, as it is considered that this approach is more reliable given the knowledge available, and more favourable to the species by offering periods of migration without possible capture. More precise updated information may be provided after the adoption of the new management framework for migratory fish in these basins (PLAGEPOMI) at the end of December 2021.

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Region : Other regions

General Comment: This text box fulfils Article 5(2)(a) and (b), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2 point 4.1 of the EU-MAP Delegated Decision annex. This text box complements Table 2.5.

Data on incidental by-catch of sensitive species is collected through two different means :

- Observers at-sea (Large pelagics at sea – see Annex 1.1 and below) : Observe programme includes an observation of all PETS species (mammals, birds, reptiles, fishes) bycaught during all fishing operations.
    - Observers must report it, indicating species name, geographical position, length and weight (if possible), how animal was released (alive, dead). These are mainly shark and rays, turtles, billfish and other fish.
- Voluntary or mandatory reports by fishermen : Report of bycatch of mammals is mandatory in France since 2019, and recorded through logbooks. Report of bycatch of other protected species (birds, reptiles, fishes) is not mandatory for fishermen in metropolitan France. By September 2022, mandatory report of all bycatch of birds, reptiles and mammals will be in force. Declaration will be facilitated for small vessels by a phone application "Visiocaptures" which is aimed to replace paper logbooks.

Additional information on planning the observation of incidental catches of sensitive species (if already filled in in Annex 1.1, please indicate where it can be found):

- Has an assessment of the relative risk of bycatch for the different gear types/metiers taken place and been taken into account for the sampling design?

No – Large pelagics at sea sampling scheme is not designed specifically for bycatch observation. Bycatch reporting by observers is performed on a opportunistic but systematic basis.

- What are the gear types/metiers that present the highest risk of bycatch per species/taxa of PETS in a given region?

There are some ecological risk assessment studies for ICCAT and IOTC, mainly for shark species:

- https://www.iccat.int/Documents/CVSP/CV071_2015/n_6/CV071062637.pdf
- https://www.iotc.org/documents/SC/21/14

However, clarification of risk of bycatch should be provided as bycatch impact on species and priorization of observation may vary depend on bycatch rate, survival rate, species state of conservation, effort…

- What are the methods to calculate the observation effort?

The observation effort is different by gear types/metiers:

- For the longline, the effort is based on the number of hooks.
- For the purse seine, the effort is calculated in number of sets.

- Does the sampling design and protocol follow the recommendations from relevant expert groups? Provide appropriate references. If there are no relevant expert groups, the design and protocol have to be explained in the text.

Yes:

- ICCAT area: https://www.iccat.int/en/bycatch.html
- IOTC area: https://iotc.org/science/wp/working-party-ecosystems-and-bycatch-wpeb

Additional information on observer protocols (if already filled in in Annex 1.1, indicate where it can be found):

- In large catches: does the protocol instruct to check for rare specimens during sorting of the catch (i.e.

at conveyor belt)? Is the observer instructed to indicate what percentage of the sorting or hauling process has been checked at "haul level"?

Y – The observer must present during the entire sorting process and check for rare specimens.

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Region : Outermost Regions

General Comment: This text box fulfils Article 5(2)(a) and (b), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2 point 4.1 of the EU-MAP Delegated Decision annex. This text box complements Table 2.5.

Data on incidental by-catch of sensitive species is collected through two different means :

- Observers at-sea (Large pelagics at sea – see Annex 1.1 and above "Other regions")
- Voluntary or mandatory reports by fishermen : Report of bycatch of mammals is mandatory in France since 2019, and recorded through logbooks. Depending on outermost regions, regulation may ask for mandatory report of specific species, but no centralized database does exist yet.
- By September 2022, mandatory report of all bycatch of birds, reptiles and mammals will be in force. Declaration will be facilitated for small vessels by a phone application "Visiocaptures" which is aimed to replace paper logbooks.

Several projects took place in Outermost regions to mitigate bycatch and identify at-risk fisheries (PALICA in French Guiana, funded by EMFF article 40, TOPASE in Martinique).

According to experts, longlines are the most at-risk gear for bycatch of sharks and turtles. Longliners are sampled by at-sea observers through Observe programs since 2007.

Additional information on planning the observation of incidental catches of sensitive species (if already filled in in Annex 1.1, please indicate where it can be found):

- Has an assessment of the relative risk of bycatch for the different gear types/metiers taken place and been taken into account for the sampling design ?

No dedicated design has been put in place for observation of bycatch of PETS in outermost regions. No on-board observation is performed yet (Obsdeb, Obsventes) except for Large pelagics at sea. Data collection relies on voluntary and mandatory report by fishermen through logbooks. Possibility to perform at-sea sampling will be explored during coming years – in a first step, a risk analysis could be performed following Natura 2000 methodology (see Region North East Atlantic) in order to summarize available knowledge and prioritize high-risk fleets.

- What are the gear types/metiers that present the highest risk of bycatch per species/taxa of PETS in a given region?

Sea turtles :

Report on interactions between turtles and fisheries is available here : https://plateforme-recherches-spm.com/wp-content/uploads/2021/04/Lu.pdf

In Guadeloupe, Martinique and French Guiana, nets were identified as high-risk for sea turtles. Turtles excluding devices (TED) are mandatory on shrimp trawxlers in French Guiana since 2016. Longlines were identified as most at-risk gear in La Réunion.

Mammals : Risk has been identified in French Guiana on *Sotalia guianensis* in fishing nets, mostly illegal ones.

http://gtmf.mnhn.fr/wp-content/uploads/sites/13/2019/03/PALICA.pdf

- What are the methods to calculate the observation effort?

NA

- Does the sampling design and protocol follow the recommendations from relevant expert groups? Provide appropriate references. If there are no relevant expert groups, the design and protocol have to be explained in the text.

Yes for Observe programm :

- ICCAT area: https://www.iccat.int/en/bycatch.html
- IOTC area: https://iotc.org/science/wp/working-party-ecosystems-and-bycatch-wpeb

Additional information on observer protocols (if already filled in in Annex 1.1, indicate where it can be found):

- Does the on-board observer protocol contain a check for rare specimens in the catch at opening of the cod-end? If YES is the observer instructed to indicate if the cod-end was NOT checked in a haul?

NA

- In gill nets - and hook-and-line fisheries: does the on-board observer protocol instruct the observer to indicate how much of the hauling process has been observed for (large) incidental bycatches that slip out of the net?

NA

- In large catches: does the protocol instruct to check for rare specimens during sorting of the catch (i.e. at conveyor belt)? Is the observer instructed to indicate what percentage of the sorting or hauling process has been checked at "haul level"?

NA. For Observe program : Y – The observer must present during the entire sorting process and check for rare specimens.

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Region : Mediterranean and Black Sea

General Comment: This text box fulfils Article 5(2)(a) and (b), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004 and Chapter 2 point 4.1 of the EU-MAP Delegated Decision annex. This text box complements Table 2.5.

Data on incidental by-catch of sensitive species is collected through three different means :

- Observers at-sea (Obsmer – see Annex 1.1) : Obsmer programme includes an exhaustive observation of all PETS species (mammals, birds, reptiles, fishes) bycaught during :
    - All fishing operations for mammals, birds, reptiles
    - All sampled fishing operation for protected

  For birds : observer have to report it, indicating species name, geographical position, age (if possible), how animal was realeased (alive, dead, in which state).
  For mammals : observer have to report it, indicating species name, geographical position, length, weight, how animal was released (alive, dead), if any mark of fishing gear is present and which type.

Observer have to put a caudal bracelet with a unique identification number on all mammals bycaught.

From 2022 onwards, Obsmer protocol will be extended to netters in Mediterranean Sea (and not only trawlers and longliners as before), in order to assess both bycatch of protected species and commercial catches (total catches and discards).

- Voluntary or mandatory reports by fishermen : Report of bycatch of mammals is mandatory in France since 2019, and recorded through logbooks. Report of bycatch of other protected species (birds, reptiles, fishes) is not mandatory for fishermen in metropolitan France. By September 2022, mandatory report of all bycatch of birds, mammals or reptiles will be in force. Declaration will be facilitated for small vessels by a phone application "Visiocaptures" which is aimed to replace paper logbooks.

- On-shore sampling "Obsventes" for elasmobranches' species (see Annex 1.1) : species listed as PETS and present during visits in auctions are measured for length.

- CF-DCF(DACOR) programme: For Corsican small-scale coastal fisheries, all catches are sampled, including by-catches of sensitive or protected species, sea-birds, mammals, reptiles, fishes, crustacean ... In small-scale coastal fisheries the catches go up one by one on board, all the by-catches are therefore identified and it is noted whether they are released alive or dead. For each individual sampled, lengths of bycatches are systematically taken, as well as the sex in the case of chondrichthyans and crustaceans. All the parameters associated to the bycatch is collected according to the CF-DCF (DACOR) sampling protocol: deep, geo-localisation, type of gear, length and mesh size of the net, number and type of hooks and fishing time. When an individual of protected species is accidentally captured, all the information is reported and the Corsican stranding network (Cetacean Association for Insular Research-RNE Corse) and the OEC are immediately contacted (release, transport to a care centre, conservation for necropsy…). All others PETS and protected species listed in the UE MAP 2021 and GFCM regulation, observed alive or dead opportunistically in the fishing trips, are taken in account in this protocol. All the data are stored in OEC Data base for Corsica and available on request for risk analysis on gear interaction in Natura 2000 and high-risk areas, for PELAGIS and the National Stranding Network via the Corsica stranding network, MPA managers … and available for the actions Plan of PELAGOS.
  Interaction SSF/ Tursiops truncatus: In order to characterise the interactions between artisanal fisheries and *Trursiops trucatus*, the CF-DCF (DACOR) protocol includes the identification of catches (discards) predated by Bottlenose Dolphins as well as the identification of specific lacerations caused in fishing nets by this marine mammal. This method was tested by the OEC on the Bouches de Bonifacio Nature Reserve (Life Linda project, Rocklin et al, 2009), then transferred to the scale of Corsica and integrated into the CF-DCF (DACOR) protocol. All the observer at sea are monitored by the OEC. (Rocklin, D., Santoni, M-C., Culioli, J-M., Tomasini, J-A., Pelletier, D. and D. Mouillot. (2009). Changes in the catch composition of artisanal fisheries attributable to dolphin depredation in a Mediterranean marine reserve. – ICES Journal of Marine Science, 66: 699–707). Each observation of dolphins at sea near fishing nets is noted and geolocated with the number of individuals and the identification of the species by the observers at sea and then recorded in the Corsican fisheries database.
  Marine turtles: All measurements and parameters specific to marine turtles are collected in accordance with the RTMMF determination and measurement sheet distributed to observers at sea.
  Sea birds: determination and length (age if it's possible) are collected. For banded animals, the information is communicated to MNHN via OEC.

Other on-board observation programs dedicated to bycatch observation in specific areas will also be launched during 2022-2024, but will **not be funded by EMFAF/DCF**, but through other EMFAF or national fundings. Goal is to integrate these observations into DCF reporting and data provided to end-users – however, efforts are still undergoing to ensure that this integration will be feasible in future years :

- National plan of action for Balearic shearwater : Regard to the national plan of action for Balearic shearwater, on-board observers is scheduled on long-liner in pilot areas in 2021 and 2022 in the Gulf of Lion (Mediterranean area) and in the bay of Biscay and the marine nature park of Iroise. In the Gulf of Lion, the project is funded by EMFF (article 40).
- Interaction between longliners and birds in Port-Cros : A pilot study was alos launched in the National Park of Port-Cros in collaboration between LPO, the national park and LPO, under OFB funding concerning the interaction between long-liners and birds. On-boards observers and mitigation

measures, if necessary, will be tested.

- Risk analysis on gear interaction in Natura 200 and high risk areas : Others on-board observer or data collection program will be organized between 2022 and 2025 in order to improve the characterization of the interaction between species (birds, mammals, turtles and diadromous fishes) and gears under the deployment of the fisheries risk analyses which is required under the Nature Directive (DHFF and DO), under the implementation of the CFP (reduction and if possible elimination of bycatches) and under the MSFD. These projects are launched in Natura 2000 area and in identified risk sector (defined by risk mapping combining data from protected species distribution, distribution of fishing effort and information concerning interaction between species and specific gears – bycatches exposition risk matrix) and will collect complementary data on bycatch of protected and endangered species in these areas. These projects, funded by EMFF – article 40, are based on observers at sea. Protocol used will be compatible with Obsmer procotol, allowing for bancarisation of datas into Harmonie database. However, duration and intensity of observation will vary depending on the project.

Additional information on planning the observation of incidental catches of sensitive species (if already filled in in Annex 1.1, please indicate where it can be found):

- Has an assessment of the relative risk of bycatch for the different gear types/metiers taken place and been taken into account for the sampling design?

Regarding Obsmer programme :

Regular Obsmer sampling plan is designed according to Obsmer objectives and takes into account fishing effort. However, as Obsmer is not designed specifically to observe bycatch of PETS, the sampling plan does not include a risk-analysis of bycatch per segment.

Regarding CF-DCF programme: The CF-DCF sampling scheme is not designed specifically to observe bycatch and PETS, the sampling plan does not include a risk-analysis of bycatch per segment. All gear types/metiers are sampled.

Regarding Natura 2000 area and identified risk sector :

In line with the European Birds Directive and the Habitats, Directive, the Environment Code (Article L. 414-4) stipulates that commercial maritime fishing activities carried out within a Natura 2000 site must be subject to a risk analysis in order to reach the conservation objectives (for species and habitats). With reference to these same directives, the action plans of the façade strategic documents (DSF) (settled under MSFD) also provide for a risk analysis for bycatches of cetacean, birds and turtles and for eight diadromous fishes at the scale of metropolitan waters. The OFB is drafting the methodological framework for carrying out these species analyses on behalf of the ministries in charge of agriculture and the environment.The assessment of the risk of catches of these protected species will be carried out from 2022 onwards and its results will be used to reinforce observation systems in identified risk sectors.

- What are the gear types/metiers that present the highest risk of bycatch per species/taxa of PETS in a given region?

In view of the "protected species" risk analyses planned from 2022, risk matrix based on scientific literature and available data have been produced for birds, turtles, diadromous fishes and mammals and regarding the different types of gear. National French experts produced this matrix (MNHN for turtles, GISOM/OFB for birds, UMS Partinat/OFB for diadromous fishes and PELAGIS, contribution pending, for marine mammals). These matrix are being finalised for the end of 2021 as part of the work on the method. They will indicate the level of risk interaction for each species (or group of species) with the different gears, separated in 4 levels, as followed, in the French fisheries context :

1. Bycatches *a priori* non-existent or exceptional
2. Rares bycatches and should not " a priori" assessed
3. Bycatches to be assessed
4. Bycatches for priority assessment.

For Corsica: The data analysis carried out in the DACOR project (Données hAlieutiques CORses) conducted

from 2017 to 2020 has shown that nets targeting crustaceans are the gear with the highest risk of bycatches.

Durieux E.D.H., Bouet M., Bousquet C., Patrissi M., Lanfranchi J-B., Susini S., Cesari F., Massey J-L., Aiello A., Culioli J-M., Lejeune P., Dijoux J., Duchaud C., Santoni M-C. (2020) Rapport scientifique final - projet Données hAlieutiques CORses (DACOR) 2017 – 2019 - FEAMP mesure 28 partenariat scientifiques – pêcheurs. 170 pp + Annexes

- What are the methods to calculate the observation effort?

Regarding Obsmer programme :

No dedicated observation effort. The total envelope of trips to sample in a year by Obsmer programm (N ~ 1200 for all Metropolitan France) is spread across all strata (sampling frames of fleets) based on the volume of landings or Regulatory prerequisite, when exists, for each of the fleets.

Regarding Natura 2000 area and identified risk sector :

To be determined in 2022-2023.

Regarding CF-DCF programme: All gear types/metiers in the trip are sampled.

- Does the sampling design and protocol follow the recommendations from relevant expert groups? Provide appropriate references. If there are no relevant expert groups, the design and protocol have to be explained in the text.

Yes for both Obsmer and CFDCF DACOR protocol

ICES WGBYC : https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=36915

GFCM recommandations : http://www.fao.org/3/ca4991en/ca4991en.pdf

Additional information on observer protocols (if already filled in in Annex 1.1, indicate where it can be found):

- Does the on-board observer protocol contain a check for rare specimens in the catch at opening of the cod-end? If YES is the observer instructed to indicate if the cod-end was NOT checked in a haul?

For Obsmer : Yes and the observer reports the criteria sampled for retained part, sampled for discards, sampled for all catch fractions or not sampled for each haul of the trip

- In gill nets - and hook-and-line fisheries: does the on-board observer protocol instruct the observer to indicate how much of the hauling process has been observed for (large) incidental bycatches that slip out of the net?

For Obsmer : Since the PETS observation is a supplementary task given to the observer on board, there is a high risk that specimen slipping out of the net is not witnessed.

For Corsica (CF-DCF): Yes, these incidental bycatches are stored as released alive in the Data Base.

- In large catches: does the protocol instruct to check for rare specimens during sorting of the catch (i.e. at conveyor belt)? Is the observer instructed to indicate what percentage of the sorting or hauling process has been checked at "haul level"?

For Obsmer : Yes, all large specimen (rare or not rare) have to be extracted from the whole catch and sampled before taking a random fraction of the remaining catch for the usual sampling. At haul level, the observer reports on the sampled percentage of the whole the catch, this value being used for raising purpose.

For Corsican (CF-DCF) : NA

(One text box (max. 1 000 words) per region/RFMO/RFO/IO)

Text Box 4.3: Fisheries impact on marine habitats

General comment: This text box fulfils Article 5 paragraph 2(a) and 2(b), Article 6 paragraph 3(a), 3(b) and 3(c) of Regulation (EU) 2017/1004 and Chapter 2, section 4.2 of the EU MAP Delegated Decision annex. It contains information on additional studies on the fisheries impact on marine habitats. This text box applies to the work plan and the annual report.

I- On-board observation of VME through Obsmer protocol :

1. Aim of the study

See Annex 1.1 for further informations on Obsmer sampling scheme.

VME listed in 2016/2336 are observed during at-sea observer trips for strata M0001 (vessels with deep-sea fishing authorization).

Observation and recordings will be experimented to other strata with bottom-gear from 2022 onwards – in 2022, photos will be taken by observers to evaluate the feasibility to identify VME indicators at the level required by EU-MAP and in order to develop training sessions for observers targeted by areas. As this data collection is new for many stratas, protocol will need to be adapted depending on species occurring by region and on the amount of VME indicators collected.

2. Duration of the study

2022-2024

3. Methodology and expected outcomes of the study

See Annex 1.1 for further informations on Obsmer sampling scheme. The extension of data collection for VME will help identifying regions and gears with high interaction. Protocol will be adapted depending on field observations to allow efficient sampling without impairing other data collection activities conducted during Obsmer trips (biological data collection, bycatch observation).

II- On-board observation of VME through CFDCF (DACOR) protocol:

1. Aim of the study

The objective of the study is to collect data on the impacts on benthic nets targeting crustaceans and demersal fish on species identified as a VME indicators listed in UE MAP 2021.

2. Duration of the study

2022-2024

3. Methodology and expected outcomes of the study

For each fishing operation, the species indicator of VMEs incidentally caught opportunistically in the fishing trip are identified by the on-board scientific observer formed to this new protocol. Data shall be collected on the occurrence (number of individuals per species or taxa, in the appropriate unit for the species concerned). Weight by species or taxa will be collected when boarding conditions and weather permit. All parameters associated to the incidental caught are collected according to the CF-DCF (DACOR) protocol: deep, geo-localisation, type of gear, length and mesh size of the net, fishing time… An experimental protocol will be tested in 2022-2023 and may be adapted according to the species collected and the types of habitat impacted. The determination of species and taxa can be carried out on the basis of photos which will be communicated to the group experts for specific identification. All these data are stored in Corsican OEC Data base. Protocol will be adapted depending on field observations to allow efficient sampling without impairing other data collection activities conducted during CF-DCF collect (biological data collection, bycatch observation).

Habitat risk analyses in N2000 site are also undertaken in parallel and under MSFD to perform risk analysis on

gear impact on marine habitat. This analysis is not funded by EMFAF/DCF but through other national or EMFAF fundings, and will not be reported under DCF and annual report.

(max 900 words per study)

Text Box 5.2: Economic and social variables for fisheries data collection

General comment: This Text box fulfils Article 5(2)(d), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 5 of the EU MAP Delegated Decision annex. It is intended to specify data to be collected under Tables 7, 8 and 9 of the EU MAP Delegated Decision annex.

1. Description of clustering

All clusters were determined in order to maintain previous clusterization and allow to compare between years. Detail is given by supra-region below.

NAO :

In Supra region NAO (*Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)*), there are 53 fleet segments, with 15 clusters grouping 35 segments. Some segments are similar for fishing techniques, length are clustered (eg dredgers in NAO). And some segments are clustered because of same characteristics in the fishing technique but keeping the same length. For all segments clusterized, this means grouping 1, 2 or 3 vessels with important segments (in terms of number of vessels).

SUPRA_REGION	FISHING_TECH	VESSEL_LENGTH	CLUSTER_NAME
NAO	DFN	VL1218	NAO DFN VL1218
NAO	PGO	VL1218	NAO DFN VL1218
NAO	PGP	VL1218	NAO DFN VL1218
NAO	DRB	VL1218	NAO DRB VL1218
NAO	DRB	VL1824	NAO DRB VL1218
NAO	DRB	VL2440	NAO DRB VL1218
NAO	DTS	VL1012	NAO DTS VL1012
NAO	PS	VL1012	NAO DTS VL1012
NAO	DTS	VL1824	NAO DTS VL1824
NAO	MGP	VL1824	NAO DTS VL1824
NAO	DTS	VL2440	NAO DTS VL2440
NAO	MGP	VL2440	NAO DTS VL2440
NAO	FPO	VL1218	NAO FPO VL1824
NAO	FPO	VL1824	NAO FPO VL1824
NAO	FPO	VL2440	NAO FPO VL1824
NAO	HOK	VL1218	NAO HOK VL2440
NAO	HOK	VL1824	NAO HOK VL2440
NAO	HOK	VL2440	NAO HOK VL2440
NAO	MGO	VL0010	NAO MGO VL0010
NAO	MGO	VL1012	NAO MGO VL0010
NAO	MGP	VL0010	NAO MGP VL0010
NAO	TM	VL0010	NAO MGP VL0010

NAO	MGP	VL1012	NAO MGP VL1012
NAO	TBB	VL1012	NAO MGP VL1012
NAO	TM	VL1012	NAO MGP VL1012
NAO	MGP	VL1218	NAO MGP VL1218
NAO	TBB	VL1218	NAO MGP VL1218
NAO	PGO	VL0010	NAO PGO VL0010
NAO	PGO	VL1012	NAO PGO VL0010
NAO	PMP	VL1012	NAO PMP VL1012
NAO	PMP	VL1218	NAO PMP VL1012
NAO	PS	VL1218	NAO PS VL1218
NAO	PS	VL1824	NAO PS VL1218
NAO	TM	VL1824	NAO TM VL1824
NAO	TM	VL2440	NAO TM VL1824

MBS :

In supra region Mediterranean and Black Sea, there are 28 fleet segments, with 7 clusters grouping 18 segments. Some segments are similar for fishing techniques, length are clustered. And some segments are clustered because of same characteristics in the fishing technique but keeping the same length. Generally, this involves grouping 1, 2 or 3 vessels with important segments (in terms of number of vessels).

SUPRA_REGION	FISHING_TECH	VESSEL_LENGTH	CLUSTER_NAME
MBS	DFN	VL1218	MBS DFN VL1218
MBS	FPO	VL1218	MBS DFN VL1218
MBS	HOK	VL1218	MBS DFN VL1218
MBS	DTS	VL1218	MBS DTS VL1824
MBS	DTS	VL1824	MBS DTS VL1824
MBS	DTS	VL2440	MBS DTS VL2440
MBS	TM	VL2440	MBS DTS VL2440
MBS	DRB	VL0006	MBS MGO VL0612
MBS	DRB	VL0612	MBS MGO VL0612
MBS	MGO	VL0612	MBS MGO VL0612
MBS	PMP	VL0006	MBS PMP VL0612
MBS	PMP	VL0612	MBS PMP VL0612
MBS	PMP	VL1218	MBS PS VL0612
MBS	PS	VL0612	MBS PS VL0612
MBS	PS	VL1218	MBS PS VL0612
MBS	PS	VL1824	MBS PS VL0612
MBS	PS	VL2440	MBS PS VL2440
MBS	PS	VL40XX	MBS PS VL2440

Other regions :

In other regions, there are 39 fleet segments, with 10 clusters grouping 27 segments. Clustered by GEO indicator and by length.

SUPRA_REGION	FISHING_TECH	VESSEL_LENGTH	GEO_INDICATOR	CLUSTER_NAME
OFR	DFN	VL0010	GF	OFR DFN VL0010 GF
OFR	FPO	VL0010	GF	OFR DFN VL0010 GF
OFR	PGO	VL0010	GP	OFR PGP VL0010 GP

OFR	PGP	VL0010	GP	OFR PGP VL0010 GP
OFR	DFN	VL1012	GP	OFR PGP VL1012 GP
OFR	FPO	VL1012	GP	OFR PGP VL1012 GP
OFR	HOK	VL1012	GP	OFR PGP VL1012 GP
OFR	PGP	VL1012	GP	OFR PGP VL1012 GP
OFR	HOK	VL2440	IWE	OFR HOK VL1824
OFR	HOK	VL1824	RE	OFR HOK VL1824
OFR	HOK	VL0010	RE	OFR HOK VL0010 RE
OFR	HOK	VL1012	RE	OFR HOK VL0010 RE
OFR	PGO	VL0010	RE	OFR PGP VL0010 RE
OFR	PGP	VL0010	RE	OFR PGP VL0010 RE
OFR	PGP	VL1012	RE	OFR PGP VL0010 RE
OFR	HOK	VL0010	MF	OFR PGP VL0010 MF
OFR	PGP	VL0010	MF	OFR PGP VL0010 MF
OFR	FPO	VL1218	MQ	OFR HOK VL1012 MQ
OFR	FPO	VL1824	MQ	OFR HOK VL1012 MQ
OFR	HOK	VL1012	MQ	OFR HOK VL1012 MQ
OFR	HOK	VL1218	MQ	OFR HOK VL1012 MQ
OFR	PGP	VL0010	MQ	OFR PGP VL0010 MQ
OFR	PS	VL0010	MQ	OFR PGP VL0010 MQ
OFR	DFN	VL0010	YT	OFR DFN VL0010 YT
OFR	PGP	VL0010	YT	OFR DFN VL0010 YT
OFR	HOK	VL0010	YT	OFR HOK VL0010 YT
OFR	HOK	VL1012	YT	OFR HOK VL0010 YT

2. Description of activity indicator

France does not use the activity indicator to divide the fleet segment into different activity level. Therefore, the activity indicator is “NA” for all fleet segments.

3. Deviation from the RCG ECON (ex. PGECON) definitions

France is gradually extending its collection coverage in the outermost regions. For the 2021 call for data, the complete data series for French Guiana and Guadeloupe from 2010 to 2019 has been added. These data concern more than 600 vessels of less than 12 metres. Next economic field survey for French Guiana and Guadeloupe is planned in 2024 (last performed in 2020 and performed every 4 years).

For Martinique (600 active vessels), an economic survey is planned in 2022 to provide indicators from 2023.

Work is currently undergoing to obtain fuel consumption data for Mayotte from customs, as well as data from shrimp trawlers in French Guiana.

And finally, for the 10-12 metre mini-longliners of Reunion, data analysis is underway to produce economic indicators for this segment.

(max. 900 words)

Text Box 6.1: Economic and social variables for aquaculture data collection

General comment: This text box fulfils Article 5(2)(e), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 6 of the EU MAP Delegated Decision annex. It is intended to specify data to be collected under Tables 10 and 11 of the EU MAP Delegated Decision annex.

1. Description of the threshold application

Concerning the thresholds to be respected for the collection of social, economic and environmental data, France is concerned by threshold b) which stipulates that Member States are not obliged to collect these data for species representing less than 5% of the Member State's aquaculture production by weight and value.

According to the latest EUROSTAT publication, the species above this 5% in both volume and value of final sales in market size are :
- Oysters (44.4% by volume and 51.0% by value)
- Mussels (31.1% by volume and 17.1% by value)
- Trout (18.5% by volume and 17.5% by value)

The collection of socio-economic data from France will focus on these three species.
All other species are below this 5% in volume and value and thus not listed in Table 6.1 :
- Sea bass and sea bream (2,2% by volume et 4,5% by value)
- Other fresh water fish (1.3% and 1.5%)
- Clam (1.3% and 1.5%)
- Carp (0.9% and 1.1%)
- Other marine fish including salmon (0.7% and 1.9%)
- Macro algae (0.1% and 0.1%)
- Other molluscs (0.1% and 0.2%)
- Crustaceans (0.0% and 0.0%)
- Micro algae (0.0% and 1.0%)
- Sturgeons (0.0% and 3.2 %)
- Tuna (0.0% and 0.0 %)
- Eel (0.0% and 0.0 %)
- Other aquatic organisms (0.0% and 0.0 %)

2. Deviation from the RCG ECON (ex. PGECON) definitions
No deviation. France applies variable definitions as listed in 'EU MAP Guidance Document' in the DCF website.

(max. 900 words)

Text Box 7.1: Economic and social variables for fish processing data collection

General comment: This text box fulfils Article 5(2)(f), Article 6(3)(a), (b) and (c) of Regulation (EU) 2017/1004, and Chapter II point 7 of the EU MAP Delegated Decision annex. MS should provide justification for complementary data collection for fish processing.
No complementary data collection planned for period 2022-2024. Data regarding fish processing will be provided through EUROSTAT. *(max. 900 words)*

ANNEX 1.1 - QUALITY REPORT FOR BIOLOGICAL DATA SAMPLING SCHEME

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 annex 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. For 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'.

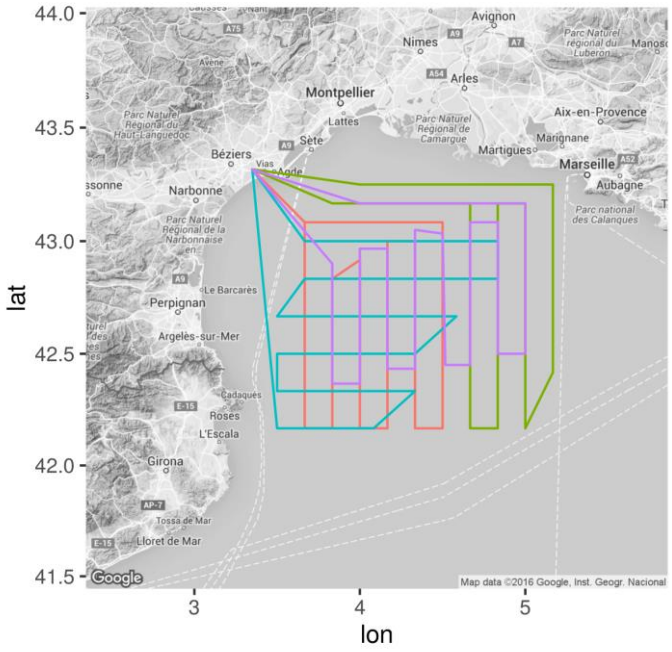
Scientific survey - FRAER

MS .....: FRA
Region.....: Mediterranean and Black Sea
Sampling scheme identifier ....: FRAER
Sampling scheme type.....: Research survey at sea
Observation type .....: SciObsAtSea
Time period of validity.....: 2022-2024
Short description (max 100 words): The survey aims at providing an abundance index of young bluefin in the Gulf of Lions through aerial survey. Flights are conducted where number of tuna schools (and other marine megafauna) are recorded. The index derived from these flights is currently used in the stock assessment of the eastern Bluefin Tuna stock and also in the Management strategy evaluation, both within ICCAT. Although the survey targets Bluefin Tuna, a large range of megafauna species are also observed (marine mammals) and integrated into the database. This survey was the first of its kind for bluefin tuna in the Mediterranean and got inspired by the work done in Australia and USA. It has been used since 2017 within the ICCAT stock assessment for eastern bluefin tuna and is currently used within the MSE, though this survey has been conducted yearly without interruption from 2009 under national fundings. It is one of the rare fisheries independent survey for this stock.

Description of the population
Population targeted: The main target species is bluefin tuna and the Gulf of Lions is the main survey area. It is very relevant as bluefin tuna has a high level of residency in this area; it can therefore be used for building a fisheries independent index for young fish, very valuable to the stock assessment of this species. The survey also allows to sample marine megafauna such as marine mammals. **Population sampled:** The survey targets young individuals in the Gulf of Lions, which have a high level of residency. The wide repartition of eastern bluefin tuna do not allow for covering its entire range (Atlantic-Med) through a survey. The survey also allows to sample marine megafauna such as marine mammals. **Stratification:** No specific strata, just different routes.

Sampling design and protocols
Sampling design description: Eight to twelve flights are done using pre-defined routes (see figure) that are selected depending on the day and the weather. Along these routes the number of tuna schools (and other marine megafauna) are

recorded with a school size estimate, a GPS location and an estimate of the distance to the plane. The data is then used to estimate a density of schools over the Gulf of Lions.



French aerial survey for bluefin tuna (FRAER) sampling scheme.

The survey takes place from early-August to mid-October over the Northwestern Mediterranean Sea, in the Gulf of Lions. This period and location is favourable to school detections as EABFT are at the surface in relation to feeding and/or foraging activity.

Depending on weather conditions, up to 20 flights per year are conducted onboard a Cessna. The aerial surveys takes place around noon when the sun is at its highest to limit sun reflection on the sea for better detection conditions for the observers. To obtain optimal spotting conditions, flights are constrained to specific weather, sunny sky and low wind speed (<10nm/h), to avoid confusion between schools and whitecaps. Four different routes were defined for the surveys (see above figure), which were comparable in length 667, 648, 580, and 700 km for route 1-4 respectively. The inter-transect distance of 13.8 km reduces chances of double counting schools on subsequent transect line. The aircraft flies at the constant speed of about 200 km/h and these routes can be then flown in less than 5 hours including distance between airport and transect. For each flight, the transect sections are randomly chosen, with the constraint that transect sections with unsuitable conditions (clouds and/or breaking waves) are skipped. When the route cannot be selected randomly, special attention is paid to maximizing the spatial coverage of the area and to evening out the amount of times the different routes are flown.

Tuna schools are spotted by trained scientific observers, from both sides of the plane/transects. If team changes, an overlapping period allows for the new members of the team to get appropriately trained to ensure the standardization of school types attribution. A GPS is used to record the position of the plane and detected tuna schools. Each detected school is then attributed to a type “tiny”, “small”, “medium”, “large” or “aggregation” for high concentrations of schools. The spotting conditions such as the wind strength (beaufort scale) and the number of observers onboard are recorded. Distances estimates are realized using marks on the arms supporting the wings, which are set-up to represent pre-defined ground distances (200, 400, 800, 1200, 1800 and 3600m) at the altitude of 300m.

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

NA – scientific survey.

Regional coordination:

There is no regional coordination per se as this survey is one of a kind for eastern bluefin tuna. However, since 2021, coordination discussions started with ICCAT GBYP that is also carrying out a survey on a different segment of the population.

Link to sampling design documentation:

Bauer, R. K., Bonhommeau, S., Brisset, B., and Fromentin, J. 2015. Aerial surveys to monitor bluefin tuna abundance and track efficiency of management measures. Marine Ecology Progress Series, 534: 221–234.

Bauer, R. K., Fromentin, J.-M., Demarcq, H., and Bonhommeau, S. 2017. Habitat use, vertical and horizontal behaviour of Atlantic bluefin tuna (Thunnus thynnus) in the Northwestern Mediterranean Sea in relation to oceanographic conditions. Deep Sea Research Part II: Topical Studies in Oceanography, 141: 248–261.

Bonhommeau, S., Farrugio, H., Poisson, F., and Fromentin, J.-M. 2010. Aerial surveys of bluefin tuna in the Western Mediterranean sea: retrospective, prospective, perspective. Collective Volume of Scientific Papers, 65: 801–811.

Buckland, S. T., Anderson, D. R., Burnham, K. P., and Laake, J. L. 2005. Distance Sampling. In Encyclopedia of Biostatistics. John Wiley & Sons, Ltd. http://onlinelibrary.wiley.com/doi/10.1002/0470011815.b2a16019/abstract (Accessed 1 March 2016).

Fromentin, J.-M., Farrugio, H., Deflorio, M., and De Metrio, G. 2003. Preliminary results of aerial surveys of bluefin tuna in the western Mediterranean sea. Collective Volume of Scientific Papers, 55: 1019–1027.

Miller, D. L., Rexstad, E., Thomas, L., Marshall, L., and Laake, J. 2017. Distance Sampling in R. bioRxiv: 063891.

Rouyer, T., Brisset, B., Bonhommeau, S., and Fromentin, J.-M. 2018. Update of the abundance index for juvenile fish derived from aerial surveys of bluefin tuna in the western Mediterranean Sea. Collective volume of scientific papers ICCAT, 74: 2887–2902.

Rouyer, T., Brisset, B., Tremblay, Y., and Fromentin, J.-M. 2019. Update of the French aerial survey index of abundance and first attempt at integrating Bluefin tuna school size estimates from video cameras. Collective volume of scientific papers ICCAT, 75.

Thomas, L., Buckland, S. T., Burnham, K. P., Anderson, D. R., Laake, J. L., Borchers, D. L., and Strindberg, S. 2006. Distance Sampling. In Encyclopedia of Environmetrics. John Wiley & Sons, Ltd. http://onlinelibrary.wiley.com/doi/10.1002/9780470057339.vad033.pub2/abstract (Accessed 1 March 2016).

Compliance to international recommendations:

There are no international recommendations for aerial surveys on bluefin tuna. This survey was the first of its kind for bluefin tuna in the Mediterranean and got inspired by the work done in Australia and USA. It has been used since 2017 within the ICCAT stock assessment for eastern bluefin tuna and is currently

used within the MSE. It is one of the rare fisheries independent survey for this stock. The sampling design is available within several ICCAT working group paper and also in the paper aforementioned.

Sampling implementation

Recording of refusal rate:

NA

Monitoring of sampling progress within the sampling year:

Not applicable to our survey. We consider the survey complete when we get at least 8 flights.

Data capture

Means of data capture:

The schools are spotted from the plane and recorded through cameras. There is no physical interaction.

Data capture documentation:

Not applicable, see above

Quality checks documentation:

Not applicable, see above

Data storage

National database:

The video and picture data, since 2016, are recorded within dataref, an ifremer server dedicated to reference data. The reference database is saved on a dedicated lab server, which is backed-up regularly.

International database:

NA

Quality checks and data validation documentation:

The data has been validated through the peer-reviewed papers published as well as through the working documents provided at ICCAT that are backing up the abundance index that is used within the stock assessment.

Sample storage

Storage description:

NA. No biological material collected through this survey.

Sample analysis:

NA. No biological material collected through this survey.

Data processing

Evaluation of data accuracy (bias and precision):

See sampling design documentation mentionned above.

Editing and imputation methods:

See sampling design documentation mentionned above.

Quality document associated to a dataset:

No DOI yet. See sampling design documentation mentionned above.

Validation of the final dataset:

The dataset is validated by two scientists. Now, with the availability of video/camera recordings, a parallell estimation has been put in place.

Scientific survey – IBTS_Q1

MS .....: FRA
Region.....: North-East Atlantic
Sampling scheme identifier ....: IBTS_Q1
Sampling scheme type.....: Research survey at sea
Observation type .....: SciObsAtSea
Time period of validity.....: 2022-2024
The NS-IBTS Q1 surveys are conducted by France every year during the first quarter, as part of the International Bottom Trawl Survey and primarily aim to estimate abundance indices (total, by age and recruitment) for the main commercial demersal fish species in the North Sea and English Channel.

Description of the population

Population targeted:

The main species targeted are whiting, cod, haddock, Norway pout, herring, sprat, mackerel and plaice. The collected data are used for respective stock assessment. The first surveys were organized in the 1960s.

Population sampled:

All fish species collected with the GOV trawl are recorded even if only a part of them are used for stock assessment.

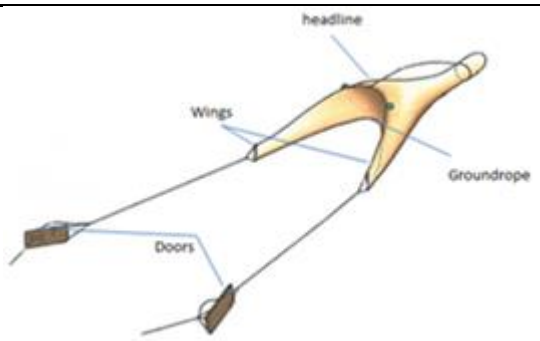
Stratification:

The current stratification of the survey has always been grid-based, using ICES statistical rectangles of roughly 30 x 30 nautical miles (1 degree longitude x 0.5 degree latitude; see Figure below). These rectangles were convenient to use for stratification of the survey because they were already being used for fisheries management purposes. Typically, each rectangle is sampled with two hauls, by two different countries/vessels, where logistically possible. The priority is given to sample all rectangles rather than performing the two hauls per ICES rectangle. The rectangle allocation between countries is assigned annually by the IBTS working group and, if necessary, by the international coordinators prior to and during the survey. The vessels are free to choose any position in the rectangles as long as the hauls are separated by at least 10 nautical miles where possible, except where nations take more than two tows per rectangle. Whenever possible, tows in adjacent rectangles should be separated by at least 10 miles.

Sampling design and protocols

Sampling design description:

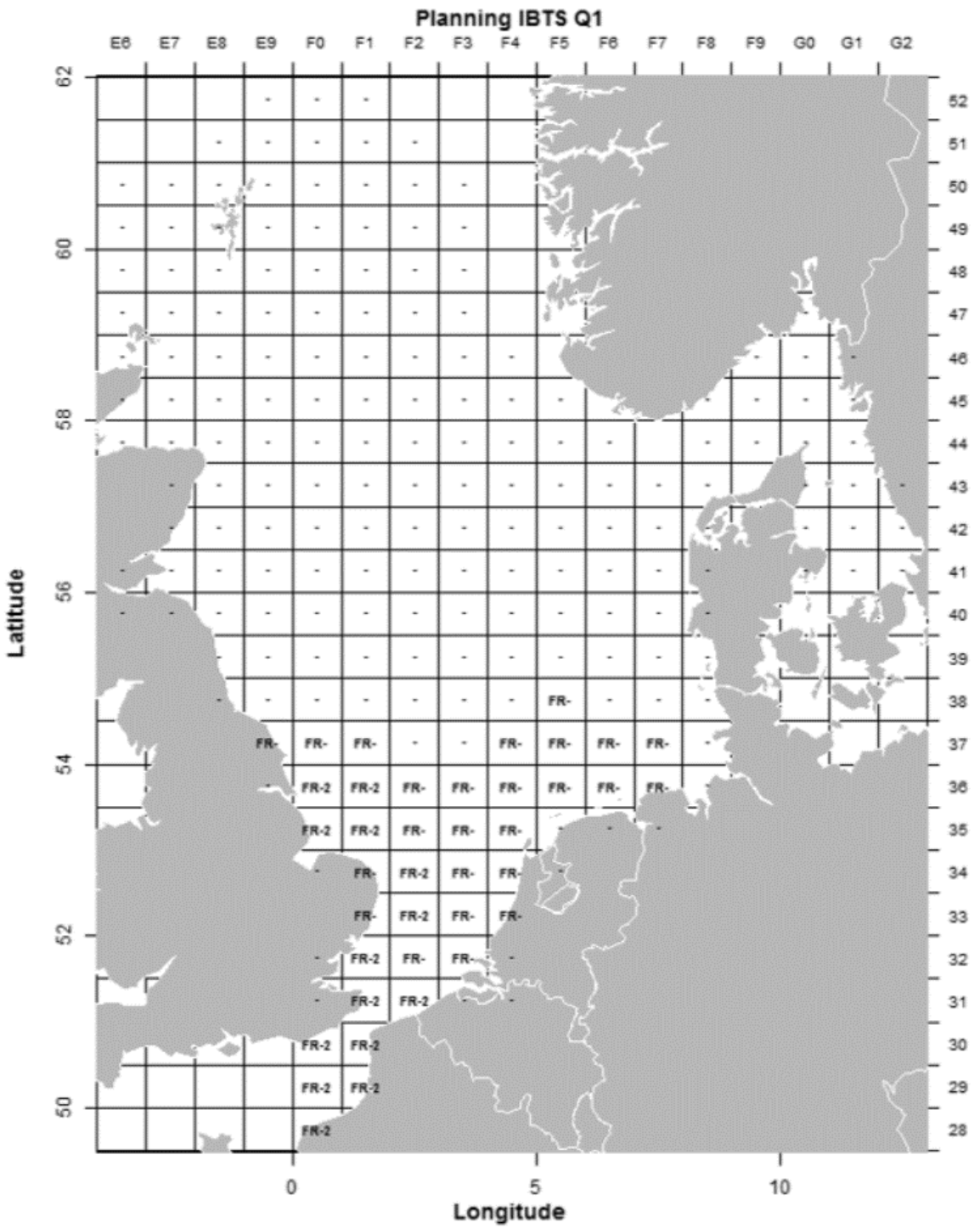
Since 1983 all nations use the GOV 36/47 (‘Grande Ouverture Verticale’), with a 20 mm stretched mesh size in the codend. Since 1992, it constitutes the recommended standard gear of the IBTS (Figure below). A standard fishing speed is about 4 knots during 30 minutes. The haul is considered as acceptable to fish for less than 30min (for safety reasons or for very large catches), however, tow under 15 minutes should be tagged as non-standard and associated reasons must be given.



Since 2016, the IBTS working group defined a new allocation of the sampling areas between countries in order to reduce time at sea. As a result, 55 hauls were allocated to the french IBTS survey, which samples the Southern North Sea and the Eastern English Channel over a period of 21 days. The hauls are being carried out by using the R/V Thalassa, according to the IBTS protocols defined at international level under the coordination of the ICES WGIBTS. Each fishing operation is systematically associated with a hydrological station and acoustic data are recorded for several echosounder frequencies and stored to be processed on shore.

Age-length keys are built for the main fish species: whiting, cod, haddock, Norway pout, herring, sprat and plaice. To estimate larval abundance indices (group 0 for herring and sprat), night sampling with a MIK (Methot-Isaac-Kidd) net is carried out following the standard protocol. Since 2006, continuous sampling of plankton (one sample per hour) is performed by means of the Continuous Underwater Fish Eggs Sampler device (CUFES). Sampling plans for monitoring phytoplankton, benthos and marine litter, as well as bird and mammal observations were initiated in 2008, thus demonstrating the multidisciplinary character of the IBTS survey and the efforts to ensure optimum use of the observation platform provided by R/V Thalassa.

The data are checked and validated on board, where they are recorded in a temporary database. On land, quality checks are applied to the data both internally and by the ICES Datras system. Following their final validation on land, the IBTS data are uploaded to the “Scientific surveys” module of Ifremer’s Harmonie database.



NS-IBTS_Q1 French survey sampling scheme

Is the sampling design compliant with the 4S principle?

NA (research survey)

Regional coordination:

International coordination through ICES WGIBTS.

Link to sampling design documentation:

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 to international recommendations:

Y – protocol defined by ICES WGIBTS.

Link to sampling protocol documentation:

Manual for the International bottom trawl surveys:

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20-%20Manual%20for%20the%20International%20Bottom%20Trawl%20Surveys%20-%20Revision%20IX.pdf

The protocols and scheduled operations lead to the calculation of ecosystem indicators. Raw data and indicators are available.

Website: http://www.ifremer.fr/SIH-indices-campagnes/index

Compliance to international recommendations:

The southern North Sea area is sampled by France and partly by the Netherlands and Denmark.

The main assessment groups using IBTS data are the Herring Assessment Working Group (HAWG) for the area "South of 62°N" (trawl data and larvae net station data), the Working Group on the assessment of demersal stocks in the North Sea and Skagerrak (WGNSSK), and the Working Group on Assessment of New species (WGNEW). The International Bottom Trawl Survey Working Group (WGIBTS) also needs the data.

Sampling implementation

Recording of refusal rate:

NA (research survey)

Monitoring of sampling progress within the sampling year:

Decisions are made during the WGIBTS working group if adjustments are needed.

Data capture

Means of data capture:

Since 1983 all nations use the GOV 36/47 (Grande Ouverture Verticale), with a double codend in 20 mm meshsize stretched to sample fishes and benthic communities. Ifremer technicians use electronic ichtyometer to measure fish and cephalopods and electronic calliper to measure crustaceans. Both are connected via bluetooth to a software ("Allegro Campagnes"). The Methot Isaac Kidd (MIK) net is a midwater ring trawl and is the standard gear for the sampling of fish larvae. A CTD sensor (Seabird19)

was submerged after each GOV and MIK hauls to measure in temperature salinity, dissolved oxygen, the turbidity and the chlorophyll on the whole water column. Several sensors included in the CTD allowed to measure also other parameters as the. Sea water is pumped at 3 meters under water surface by the CUFES device (Continuous Underway Fish Egg Sampler) for fish eggs sampling. The WP2 net is used after or before each GOV hauls and MIK stations to sample zooplankton. The zoocam is a device which allows to sort automatically eggs and zooplankton.

Data capture documentation:

Annal IBTS report is available in archimer (DOI: 10.13155/80333). Report from WGSINS (DOI: 10.17895/ices.pub.7910) and IBTSWG (DOI: 10.17895/ices.pub.7531) give recommendation for coming surveys.

Quality checks documentation:

'Y' (yes)

The DATRAS algorithm automatically checks the data quality at the uploading stage. Additionally, data are checked by specific softwares designed to detect outliers in data (e.g. length size).

Software used to check data by France:

https://wwz.ifremer.fr/emh/Outils/Allegro-Campagnes-Logiciel-de-saisie-de-donnees-d-operations-et-de-captures-au-cours-des-campagnes-halieutiques-projet-Tutti

Data storage

National database:

National website:

http://www.ifremer.fr/SIH-indices-campagnes/index

International database:

All data sets are also transmitted in the ICES-stipulated formats.

Datras website:

https://datras.ices.dk/

Catch data are send to the International data base coordinated by the ICES and available at: http://www.ices.dk/indexfla.asp.

Herring and sprat larvals data (MIK) are send immediately after the survey to ICES and used in March by the International herring assessment Working group.

Data on eggs (CUFES), zooplankton, phytoplankton and acoustic are available at Ifremer in Boulogne-sur-mer and will be used in various studies during the coming year.

A large number of ICES International Working Groups use also these data. The most important are:

- Herring Assessment Working Group for the area South of 62° N;
- Working Group on the assessment of demersal stocks in the North Sea and Skagerrak;
- International Bottom Trawl Survey Working Group.

Each country participating in the IBTS program is also involved in the IBTS Working group.

Quality checks and data validation documentation:

Data quality check is automatically performed by the DATRAS algorithm before data uploading every year.

Sample storage

Storage description:

The whole haul catches is analysed on board, no storage.

For specific research projects, few individuals or muscle pieces can be frozen. Some individuals can be stored in ethanol (70%) to be sent to experts for identification.

Sample analysis:

No sample analysis on board excepted dissection for sexual maturity and otoliths sampling.

Data processing

Evaluation of data accuracy (bias and precision):

The accuracy is good, given the usefulness of data checking softwares.

Editing and imputation methods:

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

Quality document associated to a dataset:

DOI: https://doi.org/10.17895/ices.pub.7531

Validation of the final dataset:

The DATRAS algorithm automatically check the data quality at the uploading stage. Additionally, data are checked by specific softwares designed to detect outliers in data (e.g. length size).

Scientific survey – IBTS_Q4 - CGFS

MS .....: FRA
Region.....: North-East Atlantic
Sampling scheme identifier ....: IBTS_Q4
Sampling scheme type.....: Research survey at sea
Observation type .....: SciObsAtSea
Time period of validity.....: 2022-2024
The CGFS survey is part of a historic time series of fishing surveys started in 1988 (CGFS eastern part, carried out on the N / O Gwen Drez), and extended to the western Channel on a recurring basis from 2018 (N / O Thalassa). Its main objective is to collect the basic data for stock assessments, by a direct evaluation of the abundance of the stocks and their distribution, associated with the biological sampling of the catches. Only CGFS survey is described here, as part of 2 surveys contributing to IBTS_Q4. The other survey, EVHOE, is described in another Annex 1.1.

Description of the population
Population targeted: Taking place every year between mid-September and mid-October, it contributes to the Data Collection Framework (DCF). In the Eastern Channel (zone 7d), the resulting data are used each year by the ICES international working groups, mainly **WGNSSK**(Working Group on the Assessment of Demersal Stocks in the North Sea and Skagerrak) and **WGCEPH** (Working Group on Cephalopod Fisheries and Life History). For WGNSSK, the CGFS contributes for the Eastern Channel, to the production of abundance indices for red mullet (*Mullus surmuletus*), plaice (*Pleuronectes platessa*), or cephalopods (*Sepia officinalis*); collecting information on the stage of maturity of the main commercial species (whiting (*Merlangius merlangus*), cod (*Gadus morhua*)) in order to know the proportion of mature individuals at each age. This type of information is essential for calculating the quantity of fish of reproductive age (spawning stock biomass), the level of which is one of the main indicators of the state of health of the stock. In the Western Channel (zone 7e), the CGFS has been collecting data since 2018 with the aim of providing, by 2022, the data necessary for the assessment of cephalopods, fish (bass, haddock, cod, whiting) and elasmobranchs (WGCEPH, Working Group on Cephalopod Fisheries and Life History; WGCSE, Working Group for the Celtic Seas Ecoregion; WGEF, Working Group on Elasmobranch Fishes). The survey also allows sampling and better knowledge of the entire ecosystem, responding to requests for ecosystem monitoring (**MSFD**) in particular for descriptors D1-biodiversity, D2-invasive species, D3-commercial species, D4- food webs, D5-eutrophication, D8-contaminants, D9-health issues, D10-waste and D11-noise. In addition, the physico-chemical characteristics of the water, the phytoplankton and zooplankton communities, the abundance of fish eggs as well as the specific composition of the nectonic communities are measured and analyzed throughout the survey with the aim of establishment of an ecosystem approach to fisheries. **Population sampled:**

All fish species collected with the GOV trawl are recorded even if only a part of them are used for stock assessment.

Stratification:

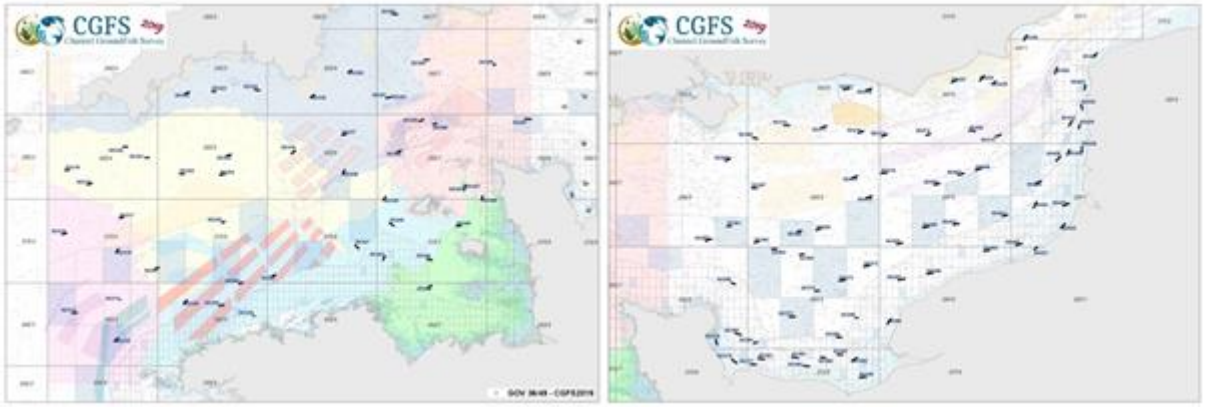
For the Eastern English Channel that is currently used for stock assessments, we follow the same stratification as the one for the IBTS survey (grid-based, using ICES statistical rectangles of roughly 30 x 30 nautical miles (1 degree longitude x 0.5 degree latitude). These rectangles were convenient to use for stratification of the survey because they were already being used for fisheries management purposes. For the Western English Channel (that started on 2018) we used a random sampling proportional to the area of previously defined ecoregions from depth, sediments type and species distribution data between 2014 and 2015. As there were no previous information on species composition from the Western Channel, the main objective was to cover as much area as possible during the first ~5 years and then assess if a grid-based sample as used on the Eastern part could be relevant. Trawls are separated by 10 nautical miles.

Sampling design and protocols

Sampling design description:

The CGFS follows the standard protocol[2] and uses the standard bottom trawl "gear A" (GOV 36/47) in the Eastern Channel and a GOV 36/49 in the Western Channel. During 33 days, 122 tows of 30 minutes will be realized in daylight at a vessel speed of 4 knots. All individuals from the haul are sorted, identified, weighted, counted and measured, according to IBTS standardised protocols. A subset of species is also subject to sex and maturity determination associated to otolith sampling for age reading, in relation with DCF requirements (plaice, sole, cod, whiting, red mullet, pouting, red gurnard, seabass). In addition to fish and cephalopods, benthic invertebrates and gelatinous organisms are also determined, counted and weighed. Litter in the trawl is sorted, counted and weighed at each station and additional biological sampling may be conducted for different purposes (e.g. MSFD requirements, request from ICES working groups, studies on genetics, food web, etc.). Hydro-biological data are gathered from CTD profiles, water sampling through Niskin bottles and zooplankton nets. Fish egg sampling (mostly sardine and horse mackerel eggs) is realised en route using a pumping device associated to semi-automatic identification software. Finally, onboard observers record birds and mammals encountered.

2 http://www.ices.dk/marine-data/Documents/DATRAS%20Manuals/Addendum_2_Manual_IBTS_Western_and_Southern_Areas_Revision_III.pdf



IBTS_Q4 French survey sampling scheme

Is the sampling design compliant with the 4S principle?

NA (research survey)

Regional coordination:

International coordination through the IBTSWK

Link to sampling design documentation:

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 to international recommendations:

Y. The CGFS survey is coordinated by WGIBTS. As such, the data collected during each survey are validated (on board and at land) and formated before being uploaded to the common database DATRAS. Global abundance or biomass indices are computed as well as abundance-by-age indices for some species, to be used in the stock assessment of plaice, red-mullet, seabass, squids, cuttlefish, horse mackerel and elasmobranchs by the ICES working groups WGNSSK WGCEP, WGWIDE, WGEF, WGCSE.

Link to sampling protocol documentation:

Manual for the International bottom trawl surveys:

http://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2010%20-%20Manual%20for%20the%20International%20Bottom%20Trawl%20Surveys%20-%20Revision%20IX.pdf

The protocols and scheduled operations lead to the calculation of ecosystem indicators. Raw data and indicators are available.

Website:

http://www.ifremer.fr/SIH-indices-campagnes/index

Compliance to international recommendations:

Y. See above.

Sampling implementation

Recording of refusal rate:

NA (research survey)

Monitoring of sampling progress within the sampling year:

Decisions are made during the WGIBTS working group if adjustments are needed.

Data capture

Means of data capture:

Ifreme technicians use electronic ichtyometer to measure fish and cephalopods and electronic calliper to measure crustaceans. Both are connected via bluetooth to a software (Allegro Campagnes) which was designed by IFREMER and subcontractors.

All the data are stored in this software:

1- Positions of hauls, depth, distance;
2- Characteristics of the net: vertical and horizontal openings;
3- Temperature and salinity.

Data capture documentation:

Last report can be found in:

« Le Roy Didier, Giraldo Carolina, Coppin Franck (2020). Compte-rendu provisoire de la campagne CGFS 2020 sur le N/O Thalassa . RBE-STH-LBH / RBE-HMMN-LRHBL ».

Rapport intermédiaire : https://archimer.ifremer.fr/doc/00664/77623/

Quality checks documentation:

'Y' (yes).

The DATRAS algorithm automatically check the data quality at the uploading stage. Additionally, data are checked by specific softwares designed to detect outliers in data (e.g. length size).

Software used to check data by France:

https://wwz.ifremer.fr/emh/Outils/Allegro-Campagnes-Logiciel-de-saisie-de-donnees-d-operations-et-de-captures-au-cours-des-campagnes-halieutiques-projet-Tutti

Data storage

National database:

Website:

http://www.ifremer.fr/SIH-indices-campagnes/index

International database:

A data set is also transmitted to ICES (Datras database) in the stipulated formats.

Datras website:

https://datras.ices.dk/

Quality checks and data validation documentation:

The DATRAS algorithm automatically check the data quality at the uploading stage. Additionally, data are checked by specific softwares designed to detect outliers in data (e.g. length size).

Software used to check data by France:

https://wwz.ifremer.fr/emh/Outils/Allegro-Campagnes-Logiciel-de-saisie-de-donnees-d-operations-et-de-captures-au-cours-des-campagnes-halieutiques-projet-Tutti

Sample storage

Storage description:

The whole haul catches is analysed on board, no storage.

For specific research projects, few individuals or muscle pieces can be frozen. Some individuals can be stored in ethanol (70%) to be sent to experts for identification.

Sample analysis:

No sample analysis on board except dissection for sexual maturity and otoliths sampling.

Data processing

Evaluation of data accuracy (bias and precision):

Data accuracy is very good as there as several algorithms and quality checks in place before submitting the data to DATRAS.

Editing and imputation methods:

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

Quality document associated to a dataset:

https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37066

Validation of the final dataset:

The DATRAS algorithm automatically check the data quality at the uploading stage. Additionally, data are checked by specific softwares designed to detect outliers in data (e.g. length size).

Scientific survey – IBTS_Q4 - EVHOE

MS .....: FRA
Region.....: North-East Atlantic
Sampling scheme identifier ....: IBTS_Q4
Sampling scheme type.....: Research survey at sea
Observation type .....: SciObsAtSea
Time period of validity.....: 2022-2024
The EVHOE survey (EValuation des ressources Halieutiques de l'Ouest Européen - Assessment of Fisheries Resources in Western Europe) contributes to the Western IBTS 4th quarter surveys. Only EVHOE survey is described here, as part of 2 surveys contributing to IBTS_Q4. The other survey, CGFS, is described in another Annex 1.1.

Description of the population

Population targeted:

The survey covers fish and invertebrate species in the Bay of Biscay and Celtic Sea and provides abundance indices for demersal species (total, recruitment and by age for selected species). Further, the collected data makes it possible to estimate the recruitment level of the several species of commercial interest. The main species relevant for stock assessment are megrim, black and white anglerfish, hake, haddock, red gurnard and to a lesser extent cod, greater forkbeard, mackerel, and various others rays (especially thornback and cukoo rays) and sharks (*e.g.* dogfishes). The data also contribute to numerous research programmes on the biology and distribution of selected species and on trends of fish and cephalopods populations in the Bay of Biscay and Celtic Sea. In the Bay of Biscay the first survey took place in 1987. In 1997 the survey area was extended to include the Celtic Sea.

Population sampled:

All fish species collected with the GOV trawl are recorded even if only a part of them are used for stock assessment.

Stratification:

The sampling scheme defined a geographic stratification that separates the Bay of Biscay in 2 areas and the Celtic Sea into 3 areas and seven depth strata from 20 m to 600 m.

Sampling design and protocols

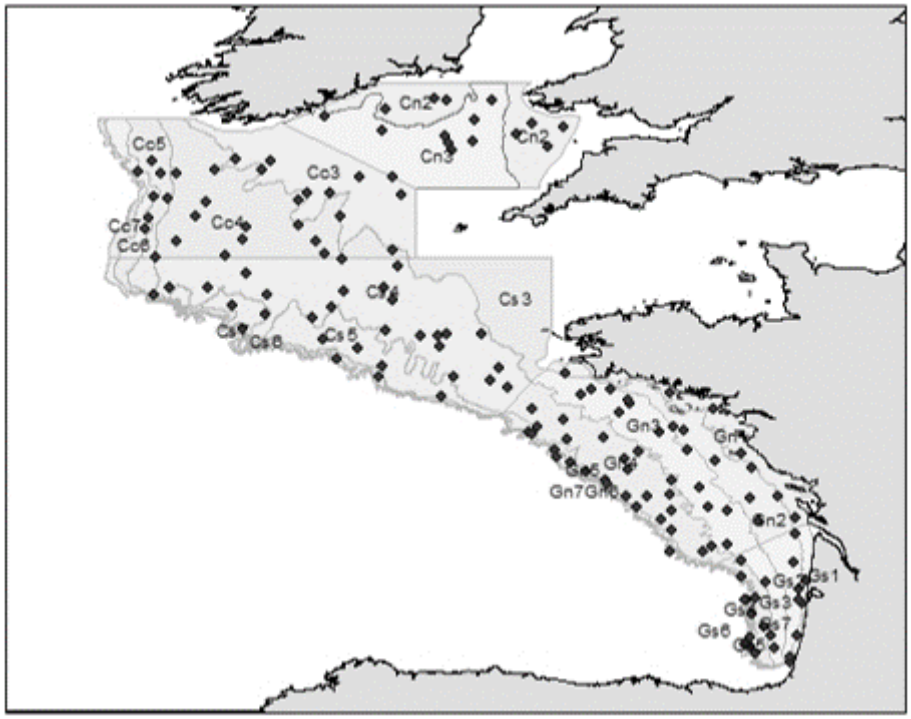
Sampling design description:

Each year, bottom trawling is carried out from mid-October to early December (45 days, 155 stations, research vessel "Thalassa") using standard protocols (sampling plan, fishing gear, catch analysis protocol). Since 1987 all nations use the GOV 36/47 ('Grande Ouverture Verticale'), with a 20 mm stretched mesh size in the codend (illustration of the trawling method available on the following link: https://image.ifremer.fr/data/00624/73617/).

Since 1992, it constitutes the recommended standard gear of the IBTS. A standard fishing speed is about 4 knots during 30 minutes. The haul is considered as acceptable to fish for less than 30min (for safety reasons or for very large catches), however, tow under 20 minutes should be tagged as non-standard and associated reasons must be given.

The sampling scheme defined a geographic stratification that separates the Bay of Biscay in 2 areas and the Celtic Sea into 3 areas and seven depth strata from 20 m to 600 m (Fig. 1 and Table 3). From 1987 to 2015, the sampling strategy followed a stratified random strategy (Fig. 1). A Neyman allocation on numbers variance averaged on the 4 most important commercial species (hake, the two species of monkfish and northern megrim) was utilized to set the number of stations per stratum. The number of stations proportional to the surface of the stratum and minimum of two stations per stratum. Each sampled station was obtained by random selection from a set of reference stations trawlable in the sampled area with the aim of sampling at least 140 stations per year. The survey design was recently revised to become a stratified systematic unaligned design with fixed stations. The new designed was approved by WGIBTS and is implemented from 2016. For each haul, all fish and cephalopods are identified and measured. For several commercial species otolithes are sampled for age reading; species composition and abundance of benthos is regularly observed. Biological parameters for commercially exploited species are collected in accordance with the sampling plan designed and coordinated by the ICES IBTS working group. Temperature and salinity profiles are collected for each haul. Sampling plans for monitoring zooplankton, benthos and litter items, as well as bird and mammal observations are also implemented.

This series is also coordinated internationally by the ICES IBTS Working group, with standardized protocols that can be found on the ICES data portal (DATRAS).



IBTS_Q4 French survey sampling scheme

Is the sampling design compliant with the 4S principle?

NA (research survey)

Regional coordination:

International coordination (ICES IBTS working group: https://www.ices.dk/community/groups/Pages/IBTSWG.aspx

Link to sampling design documentation:

North-East Atlantic IBTS surveys manual:

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

EVHOE manual (summary):

http://datras.ices.dk/Documents/Manuals/Manuals.aspx

Specific survey details:

https://campagnes.flotteoceanographique.fr/series/8/fr/

Compliance to international recommendations:

Y (yes), according to ICES IBTS working group recommendations

Link to sampling protocol documentation:

North-East Atlantic IBTS surveys manual:

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

EVHOE manual (summary):

http://datras.ices.dk/Documents/Manuals/Manuals.aspx

A set of videos made on board provide additional elements of understanding of all the operations performed and the protocols applied:

- Lesbats Stephane, Garren Francois.: Tutoriel vidéo campagne halieutique - chalutage. https://image.ifremer.fr/data/00624/73617/, 2019a
- Lesbats Stephane, Garren Francois, Le Roy Didier.: Tutoriel vidéo campagne halieutique - fonctionnement de la salle de tri du N/O Thalassa. https://image.ifremer.fr/data/00624/73650/, 2019b

Compliance to international recommendations:

Y (yes), according to ICES IBTS working group recommendations

Sampling implementation

Recording of refusal rate:

NA (research survey)

Monitoring of sampling progress within the sampling year:

NA (research survey)

Data capture

Means of data capture:

Data is recorded on board with an open-source software especially developed for fisheries surveys ("Allegro Campagne" software). Since 2016, the lengths are also measured using an electronic ichthyometer directly connected to the data management system. Only the sizes of the largest individuals (> 85cm) and the weight data of the sub-samples and individuals fish are still entered manually. An illustration of the data acquisition methods is available on the following link: https://image.ifremer.fr/data/00624/73650/

Data capture documentation:

- Onboard data capture software ("Allegro Campagne" software,):

http://www.ifremer.fr/allegro/

https://forge.codelutin.com/projects/tut

- North-East Atlantic IBTS surveys manual:

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

Quality checks documentation:

Data quality checking and data storage follow the same procedures as for North-Sea IBTS (see previous section). The validated data are uploaded to the "Scientific surveys" module of Ifremer's Harmonie database. A data set is also transmitted to ICES (Datras database) in the stipulated formats.

The collected information contributes to the production of survey-derived ecosystem indicators (codes 1 to 4 of Appendix XIII of the technical Decision).

Sample storage

Storage description:

The whole haul catches is analysed on board, no storage.

For specific research projects, few individuals or individual pieces (*e.g.* muscle, stomach) can be frozen. Some individuals can be stored in ethanol (70%) to be sent to experts for identification.

Sample analysis:

No sample analysis on board except dissection for sexual maturity and otoliths sampling.

Data storage

National database:

Data are stored in HARMONIE and can be extracted from a website. These are basic data collected and computed to the sampling operation (generally a haul) and organized according to geographic units defined in relation to the sampling plan.

The data from Atlantic can be extracted from the following website:

http://www.ifremer.fr/SIH-indices-campagnes/source/zone.action?facade=atlantique

EVHOE dataset is also available from the SEANOE portal: Laffargue Pascal, Delaunay Damien, Badts Vincent, Berthele Olivier, Cornou Anne Sophie, Garren Francois (2021). **Long term benthic community dataset for fish and cephalopods on the continental shelves of the Bay of Biscay and the Celtic Sea**. SEANOE. https://doi.org/10.17882/80041

International database:

A data set is transmitted to ICES (Datras database: https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx) in the stipulated formats.

Quality checks and data validation documentation:

Data quality check is automatically performed by the DATRAS algorithm before data uploading every year. In addition to these controls, a series of controls are carried out on board: detection of outliers with, for example, a control of sizes and weights according to standard relations by species.

Software used to enter and check data by France:

https://wwz.ifremer.fr/emh/Outils/Allegro-Campagnes-Logiciel-de-saisie-de-donnees-d-operations-et-de-captures-au-cours-des-campagnes-halieutiques-projet-Tutti

Data processing

Evaluation of data accuracy (bias and precision): The annual report of the ICES IBTS working group provides a synthetic evaluation and visualization of all the data produced by the campaigns following the IBTS protocol. The latest report can be found at:

https://www.ices.dk/community/groups/Pages/IBTSWG.aspx

Editing and imputation methods:

https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf

Quality document associated to a dataset:

DOI: https://doi.org/10.17895/ices.pub.7531

Validation of the final dataset:

Data quality check is automatically performed by the DATRAS algorithm before data uploading every year. In addition to these controls, a series of controls are carried out on board: detection of outliers with, for example, a control of sizes and weights according to standard relations by species.

Software used to enter and check data by France:

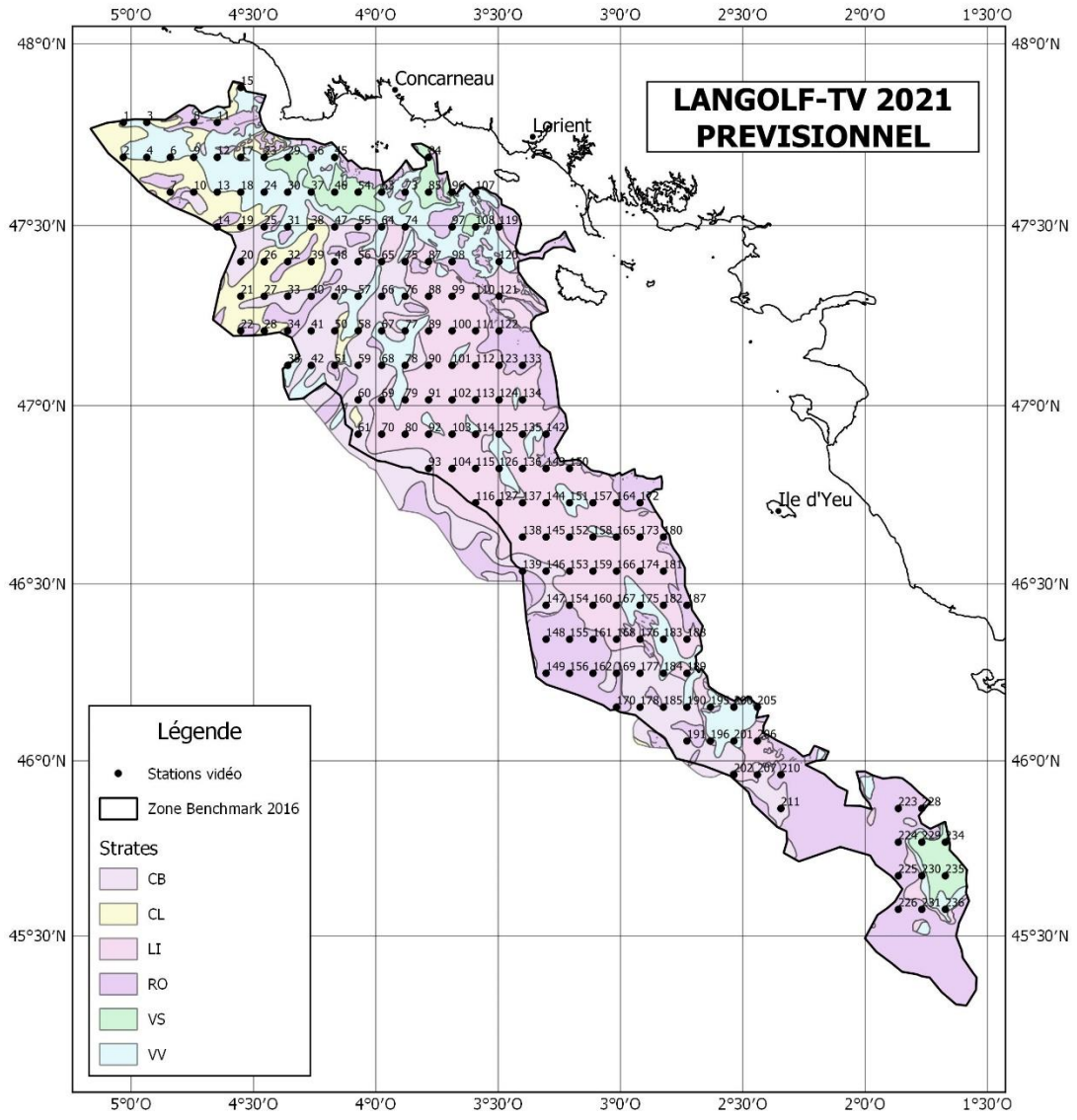
https://wwz.ifremer.fr/emh/Outils/Allegro-Campagnes-Logiciel-de-saisie-de-donnees-d-operations-et-de-captures-au-cours-des-campagnes-halieutiques-projet-Tutti

Scientific survey – LangolfTV

MS .....: FRA
Region.....: North-East Atlantic
Sampling scheme identifier ....: LangolfTV
Sampling scheme type.....: Research survey at sea
Observation type .....: SciObsAtSea
Time period of validity.....: 2023-2024
The UWTV survey named "LANGOLF-TV" aims at defining an abundance for Nephrops norvegicus in the Bay of Biscay.

Description of the population
Population targeted: Norway lobster (*Nephrops norvegicus*) **Population sampled:** Norway lobster of the Bay of Biscay. **Stratification:** Spatial stratification vs. sedimentary criteria. Six strata are defined accordingly to the mud composition and to its origin (typical muddy grounds, mixed muddy-sandy grounds, rough sea bottom crossed by muddy channels).

Sampling design and protocols
Sampling design description: In accordance with other routinely UWTV surveyed stocks, the sampling protocol applied since 2014 has been a systematic one advantaged by wider spatialised explorations on collected data. A distance of 4.7 nautical miles was retained similarly to the FU22 Smalls Ground surveyed by Marine Institute (Republic of Ireland). From 2016 onwards the survey duration has been longer than previously: 14 effective working days were planned (instead of 10). Thus, it has been allowed to cover for the first time the area contained in the outline of the Central Mud Bank no belonging to any sedimentary stratum: this area known as not trawled due to rough sea bottom concentrate moderate fishing effort targeting *Nephrops* (16164 km² were covered by sampling instead of 11676 km² of the historical five sedimentary strata). A coverage by 180 stations is recommended in order to obtain statistically acceptable precision of estimates for numbers of burrows.



Langolf TV sampling scheme.

Is the sampling design compliant with the 4S principle?

NA (research survey)

Regional coordination:

International coordination through ICES WGNEPS. National partnership of Ifremer and National Committee of Fishing Industry. Partnership (Ifremer, France and Marine Institute, Republic of Ireland) for the equipment and RV used for the UXTV survey.

Link to sampling design documentation:

- **Anon, 2007.** Report of the Workshop on the use of UWTV surveys for determining abundance in Nephrops stocks throughout European waters (WKNEPHTV). *ICES CM: 2007/ACFM: 14 Ref: LRC, PGCCDBS.*

- **Anon, 2008.** Report of the Workshop and training course on Nephrops burrow identification (WKNEPHBID).*ICES-CM:2008/LRC:3Ref:LRC,ACOM.*
- **Anon 2010.** Report of the Study Group on Nephrops Surveys (SGNEPS). *ICES CM 2010/SSGESST: 22. Ref: SCICOM, ACOM.*
- **Anon, 2017.** Report of the Benchmark Workshop on Nephrops Stocks (WKNEP), *24–28 October 2016, ICES CM 2016/ACOM:38*. 221 pp.
- **Anon, 2019.** Working group on Nephrops surveys (WGNEPS; outputs from 2019). *ICES Scientific Reports, Vol. 2, issue 16, Split (Croatia), 12-14/11/2019*: 91 p.

Compliance to international recommendations:

Y (yes) According to recommendations from the **W**orking **G**roup for **Nep**hrops **S**urveys (WGNEPS) of ICES.

https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37541

Link to sampling protocol documentation:

No English version of the manual for the surveys is available.

Compliance to international recommendations:

Accordingly to recommendations from the **W**orking **G**roup for **Nep**hrops **S**urveys (WGNEPS) of ICES.

https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37541

Sampling implementation

Recording of refusal rate:

NA (research survey)

Monitoring of sampling progress within the sampling year:

NA (research survey)

Data capture

Means of data capture:

The project was planned owing to a partnership with the "Marine Institute" (Republic of Ireland) with participation of one expert scientist and one electronics technician from Ireland joining the team of five French scientists. The equipment (sledge, computing hardware, screens, recorders) were provided by the "Marine Institute". The sledge is based on the Scottish material (2.5 m*2.7 m*2.5 m; weight=80 kg) and corresponds to the standardised validated by the WGNEPS (ICES) for the UWTV surveyed stocks.

Data capture documentation:

Latest version in the Final Report 2020 (WGNEPS, ICES):

https://community.ices.dk/ExpertGroups/wgneps/_layouts/15/start.aspx#/2020%20Meeting%20Documents/

Quality checks documentation:

The quality checks documentation is available in yearly basis in the report of the WGNEPS (Working Group on *Nephrops* surveys, ICES).

Sample storage

Storage description:

Under standard sampling conditions storage should not be necessary if only the *Nephrops* stock assessment is intended among the various tasks of the survey as the interpretation of video tracks is carried out onboard by pairs of specialized reviewers. For recent years (2020 and 2021) the footage was exceptionally analysed onshore after the end of surveys because of the pandemic context. The storage for any year is performed on NAS drivers aiming to satisfy specific requests of different scientific projects *e.g.* analysing interactions between crustaceans or focusing to quantify fishing activity by towed gears on the sea ground.

Sample analysis:

There is no analysis of biological samples obtained by the survey.

Data storage

National database:

SD videos from tracks on years 2014-2018 saved on DVDs, the storage for HD system used from 2019 onwards is carried out on NAS drive. Information available under access format database. The reference database is saved on a dedicated lab server backed-up regularly. Extractions (ASCII format, spreadsheets) allow to process on the standardised assessment aiming the exploitation projections and stock yearly advice.

International database:

An underwater television (UWTV) survey manual has been accepted for publication in the ICES Techniques in Marine Environmental Sciences (TIMES) series. The working group is currently developing plans for a *Nephrops* UWTW database to be established at the ICES data centre.

Quality checks and data validation documentation:

The quality checks documentation is available in yearly basis in the report of the WGNEPS (Working Group on *Nephrops* surveys, ICES).

See:
https://community.ices.dk/ExpertGroups/wgneps/_layouts/15/start.aspx#/2020%20Meeting%20Document/

Data processing

Evaluation of data accuracy (bias and precision):

The accuracy is considered as satisfactory: relative precision fluctuating in the range 15-19% throughout the time series 2014-2021 with only one value (2020) exceeding 20%. The different sources of bias (edge effect, detection rate, burrows occupancy rate, species identification) are included in the calculation process (cumulative correction factor equal to 1.24 used for the final estimate).

Editing and imputation methods:

See sampling design documentation cited above (report WGNEPS).

Quality document associated to a dataset:

Annual report of the WGNEPS.

The latest one:

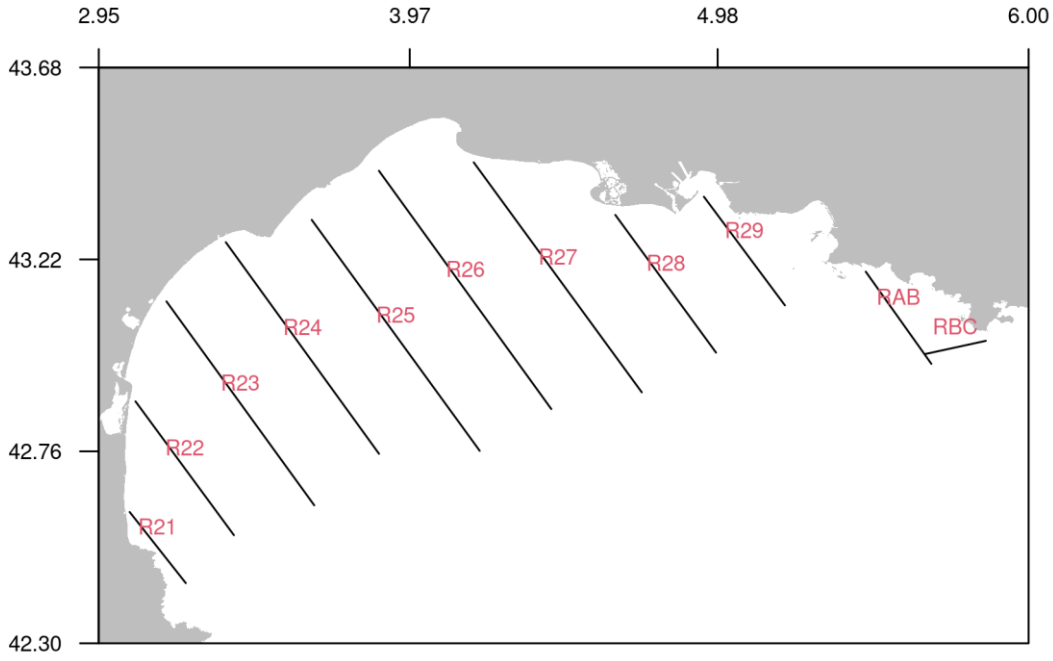
https://community.ices.dk/ExpertGroups/wgneps/_layouts/15/start.aspx#/2020%20Meeting%20Document/

Validation of the final dataset:

A validation by the test CCC allows to decide on the conformity or not of each reader. Linn's approach as detailed by annual reports of the WGNEPS is the basis for validation: at least two readers have to provide estimate for number of burrows by track; in the case of significant disagreement between them, a third reader is associated (15-20% of samples by survey).

Scientific survey – MEDIAS

MS .....: FRA
Region.....: North-East Atlantic
Sampling scheme identifier ....: MEDIAS
Sampling scheme type.....: Research survey at sea
Observation type .....: SciObsAtSea
Time period of validity.....: 2022-2024
PELMED surveys started in 1993. In the Gulf of Lion, systematic sampling is performed along 9 parallel and regularly spaced transects (inter-transect distance = 12 nautical miles). From 2008 to 2013, an extension in the North Catalan Sea was conducted to better cover the small pelagics distribution. This extension is no longer conducted since 2016 as Spain now covers the area using the MEDIAS protocol. In replacement, the survey has been extended towards the East (see map below RAB -> RBC) to better cover the sardine habitat.



MEDIAS French survey sampling scheme

Description of the population
Population targeted: Small pelagic fish (sardines, anchovies, sprats, horse mackerel, mackerel...). **Population sampled:** Small pelagic fish (sardines, anchovies...).

Stratification:

NA

Sampling design and protocols

Sampling design description:

The protocol is similar to the PELGAS survey in the Bay of Biscay. Acoustic data are obtained by means of echosounders (Simrad ER60) and recorded at constant speed of 8 $nm.h^{-1}$. A 3D-echosounder (Simrad ME70) is also now installed and used discriminate schools. The size of the elementary distance sampling unit (EDSU) is 1 nautical mile. Discrimination between species is done both by echo trace classification and trawl composition. Each time a fish trace is observed for at least 2 nm on the echogram, the boat turns around to conduct a ~30 min-trawl at 4 $nm.h^{-1}$ to evaluate species composition and length distribution. While all 5 frequencies are visualized during sampling and help deciding when to conduct a trawl, only the energies from the 38kHz echosounder are used to estimate fish biomass.

Adopting an ecosystem approach, observations and counts of cetaceans and birds encountered on the survey transects are also made. Hydrological stations are performed in the middle of each trawl and at the ends of each transect. This comprises plankton nets, CTD casts, and water sampling through Niskin bottles. Since 2020 a microplastic monitoring with a MANTA net has been carried out for the purposes of the Marine Strategy Framework Directive (MSFD) French legislation.

The MEDIAS protocol is applied. This guarantees availability of data under the required format, allowing potential use to estimate ecosystem indicators linked to the scientific surveys (codes 1 to 4 of appendix XIII of the technical Decision 93/2010/EU).

Eleven transects totalling around 325 nautical miles of acoustic acquisition are planned yearly, along with two or three daily trawl hauls coupled with hydrology parameters collection will be performed on echo- detections not exceeding the 200-metre isobath.

Is the sampling design compliant with the 4S principle?

NA (scientific survey)

Regional coordination:

International coordination through MEDIAS working group and RCG Med.

Link to sampling design documentation:

The MEDIAS French survey is internationally coordinated by the MEDIAS working group. Methods have been validated by MEDIAS and are described in details in the survey protocols manual: http://www.medias-project.eu/medias/website/handbooks-menu.html

Compliance to international recommendations:

Y

Link to sampling protocol documentation:

The survey protocols manual is available:

http://www.medias-project.eu/medias/website/handbooks-menu.html

Compliance to international recommendations:

Y

Sampling implementation

Recording of refusal rate:

NA (not applicable, in case of research surveys).

Monitoring of sampling progress within the sampling year:

NA

Data capture

Means of data capture:

The HERMES (Hydroacoustics Efficient Recording Module for EchoSounders) software was used to configure and archive acoustic records.

The MOVIES 3D software was used to visualize and analyze acoustic data.

https://www.flotteoceanographique.fr/Nos-moyens/Logiciels-de-la-flotte/Gestion-de-missions-et-des-donnees/HERMES-et-MOVIES3D

For biological samples, we use an electronic ichtyometer (BIGFIN) to measure fish, cephalopods and jellyfish which is connected via bluetooth to a software (Allegro Campagnes – see link below) designed by IFREMER to record fishing operation data at sea.

All the data are stored in this software:

1- Positions of hauls, depth, distance
2- Characteristics of the net: vertical and horizontal openings,
3- Catches (species composition of the catch with weights, numbers, sizes etc.)

After the survey, data are formatted into the EchoR format using the EchoR package designed by Ifremer:

https://archimer.ifremer.fr/doc/00128/23879/

Data capture documentation:

1-MOVIES3D Software:

https://gitlab.ifremer.fr/fleet/movies/pymovies_3d/-/wikis/MOVIES3D

2- Software Allegro Survey:

https://wwz.ifremer.fr/emh/Outils/Allegro-Campagnes-Logiciel-de-saisie-de-donnees-d-operations-et-de-captures-au-cours-des-campagnes-halieutiques-projet-Tutti

Quality checks documentation:

Y

1- Software Allegro Survey:

https://wwz.ifremer.fr/emh/Outils/Allegro-Campagnes-Logiciel-de-saisie-de-donnees-d-operations-et-de-captures-au-cours-des-campagnes-halieutiques-projet-Tutti

2-An R routines are used to check the quality of catch data and acoustic echo-integration results.

https://archimer.ifremer.fr/doc/00128/23879/

Data storage

National database:

Catch data are stored within the HARMONIE online database with a restricted access.

Acoustic data are recorded within an dedicated lab server, which is backed-up regularly.

The hydrological data are archived at the SISMER and are accessible via the survey's web pages in DATA MANAGED BY SISMER section (e.g https://campagnes.flotteoceanographique.fr/campagnes/18000922/index.htm).

International database:

NA

Quality checks and data validation documentation:

NA

Sample storage

Storage description:

The whole haul catches is analysed on board, no storage.

Zooplankton samples are fixed and buffered in 4% formaldehyde and seawater.

Sample analysis:

Anchovy and sardine age determination is conducted onboard, based on otoliths samples.

Data processing

Evaluation of data accuracy (bias and precision):

Y. Acoustic data analyses (stock estimation, length-weight relationships, etc.) are performed using R scripts (EchoR package) using the equations described in the following documents:

https://archimer.ifremer.fr/doc/00003/11446/

https://archimer.ifremer.fr/doc/00128/23879/

Echo partitioning was based on echogram visual scrutinization, thus a CV associated to Hauls / ESDUs associations was estimated.

A script in R to calculate geostatistical CV associated with biomass estimates from acoustic survey,

based on Walline et al. (2007) was used.

Editing and imputation methods:

Editing and imputation methods are described in the survey protocols manual:

http://www.medias-project.eu/medias/website/handbooks-menu.html

Quality document associated to a dataset:

https://doi.org/10.18142/19

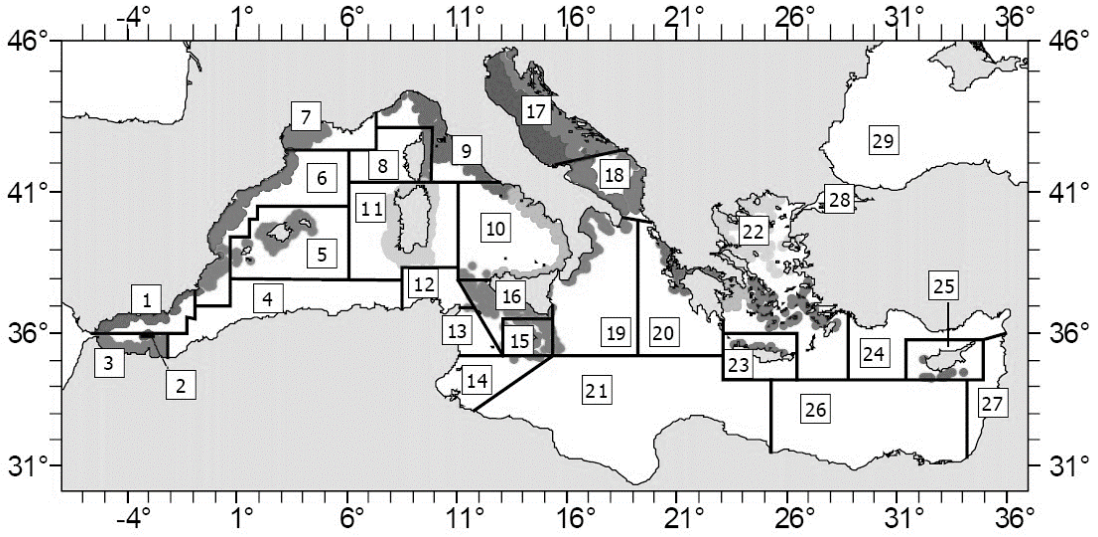
Validation of the final dataset:

The dataset is validated during the MEDIAS Steering Committee Coordination Meeting.

Scientific survey – MEDITS

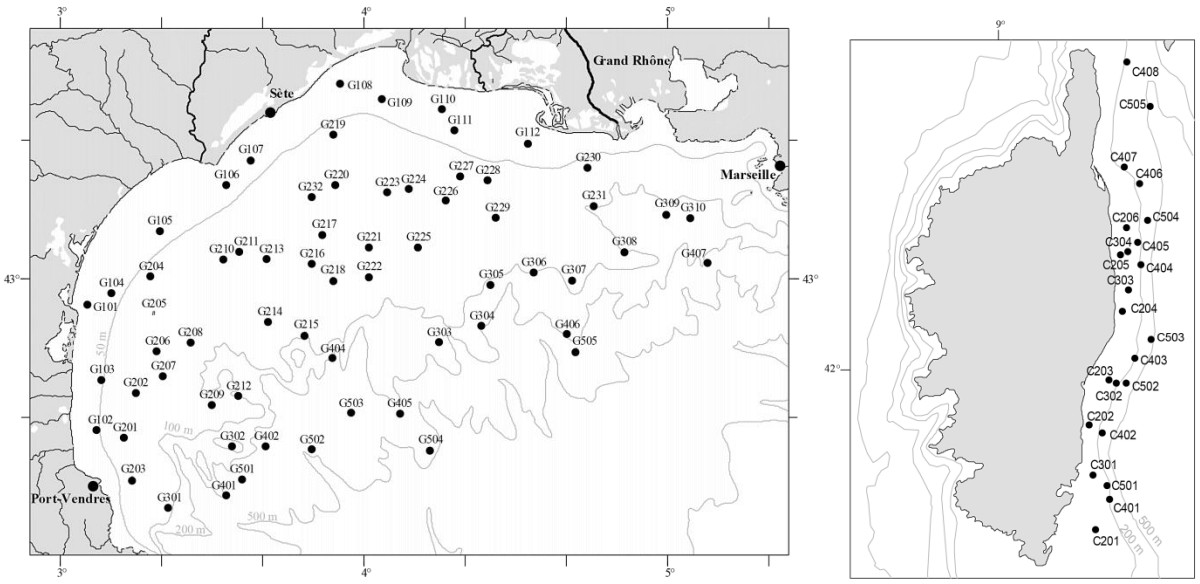
MS .....: FRA
Region.....: North-East Atlantic
Sampling scheme identifier ....: MEDITS
Sampling scheme type.....: Research survey at sea
Observation type .....: SciObsAtSea
Time period of validity.....: 2022-2024

The aim of the MEDITS French survey is to determine the distribution, abundance and length (age) structure of demersal fish, crustaceans and shellfish species in the trawlable areas between 10 m and 800 m on the Eastern coast of Corsica (GSA 8) and in the Gulf of Lions (GSA 7). The MEDiterranean International bottom Trawl Survey (MEDITS) programme launched in 1993 at the instigation of the European Commission, involves participants from all Mediterranean and Black Sea Member States.



hyperlink:

http://www.sibm.it/SITO%20MEDITS/principaleprogramme.htm



MEDITS French survey sampling scheme (Gulf of Lions on the left, Eastern Corsica on the right).

Description of the population

Population targeted:

For each species caught during MEDITS, the total weight and number of individuals should be collected.

Since 2012, the MEDITS reference list of target species (Annex VI of MEDITS international protocol) includes 82 species, of which 32 are Elasmobranches. The list also includes all species of the Epinepheus and Scombergenera, for which length measurements should be obtained. For all the 82 species and the two genera mentioned above (Epinepheus and Scomber) and reported in Annex VI, the total number of individuals, the total weight and the individual length should be collected.

This list has been further splitted in two groups:

-MEDITS G1 includes 41 species with 9 demersal (3 fish, 4 crustaceans and 2 cephalopods) and 32 Selachians. For these species the total number of individuals, the total weight, the individual length, and also biological parameters including sex, maturity, individual weight and age (age has been proposed only for the teleosteans of the Group 1) should be collected;

-MEDITS G2 includes 43 species for which only total number of individuals, total weight and individual length should be collected.

Population sampled: Following the protocol, when the catch of a given species (of the 84 targetted species) or a fraction of a given species (e.g. juveniles) is too abundant to be measured in extenso it is reasonable to take a representative sub-sample of the catch.

Stratification:

MEDITS takes place in several areas of the Mediterranean Sea using a standardized sampling methodology applied to multiple GSA(s) in the Mediterranean. The standardization of observation methods allows the reproduction of trawls under similar conditions comparing indices of species abundance in an area and between areas

- Period (may-july)
- Location of the haul stations: Distribution of stations proportionally to the surface of the strata, with random draw in each stratum:
  -10 strata in the Gulf of Lions (65 hauls)

  -10 strata in the Eastern Corsica (23 hauls)
- Characteristics and methods of use of the catching device: TRAWL
- Biological observations
- File Formats (TA, TB, TC, TE, TL)

The sampling scheme considering the strata in GSA 7 (Gulf of Lions) and 8 (Eastern Corsica) is the following:

Strate	PAYS	Depth	Surface	LibelleFaoStratum
12101	FRA	10-50	1482	Gulf of Lions
12102	FRA	50-100	3911	Gulf of Lions
12103	FRA	100-200	819	Gulf of Lions
12104	FRA	200-500	709	Gulf of Lions
12105	FRA	500-800	660	Gulf of Lions
12106	FRA	10-50	696	Gulf of Lions
12107	FRA	50-100	2610	Gulf of Lions
12108	FRA	100-200	1734	Gulf of Lions
12109	FRA	200-500	653	Gulf of Lions
12110	FRA	500-800	586	Gulf of Lions
13101	FRA	10-50	166	East Corsica
13102	FRA	50-100	521	East Corsica
13103	FRA	100-200	234	East Corsica
13104	FRA	200-500	920	East Corsica
13105	FRA	500-800	867	East Corsica
13106	FRA	10-50	135	East Corsica
13107	FRA	50-100	524	East Corsica
13108	FRA	100-200	153	East Corsica
13109	FRA	200-500	383	East Corsica
13110	FRA	500-800	960	East Corsica

Sampling design and protocols

Sampling design description:

The MEDITS survey is internationally coordinated by the international MEDITS coordination working group. Methods are described in details in the international MEDITS survey handbook manual: https://archimer.ifremer.fr/doc/00117/22783/

Methods are described further in the DOI:

https://doi.org/10.18142/7

Considering the french part of the survey, each year, 88 bottom trawl hauls (respectively 65 in GSA 7 and 23 in GSA 8) are carried out by the research vessel “Europe” in late Spring (35 days at sea between May and early July) following a standardised protocol common to all the participant countries. Hauls

positions are replicated from year to year, last thirty minutes (one hour >200m) and are coupled with regular measurements of bottom water temperature and salinity.

Is the sampling design compliant with the 4S principle?

NA (research survey)

Regional coordination:

The MEDITS survey is internationally coordinated by the MEDITS working group, following annual meetings.

Link to sampling design documentation:

The MEDITS survey sampling design has been validated by the international WG and is described in the survey protocol manual:

https://archimer.ifremer.fr/doc/00117/22783/

Compliance to international recommendations:

Y – GFCM DCRF / MEDITS working group

Link to sampling protocol documentation:

The MEDITS survey sampling design has been validated by the international WG and is described in the survey protocol manual:

https://archimer.ifremer.fr/doc/00117/22783/

Compliance to international recommendations:

Y – GFCM DCRF / MEDITS working group

Sampling implementation

Recording of refusal rate:

NA (research survey)

Monitoring of sampling progress within the sampling year:

NA (research survey)

Data capture

Means of data capture:

In France, all the biological samples caught with the net are analysed, using an electronic ichtyometer device (BIGFIN) to measure fish and cephalopods and electronic calliper (Sylvac) to measure

crustaceans. Both are connected via bluetooth to a software (Allegro Campagnes – see link below) which was designed by IFREMER and subcontractors.

All the data are stored in this software:

1- Positions of hauls, depth, distance
2- Characteristics of the net: vertical and horizontal openings,
3- Temperature and salinity

After the survey, data are formatted into the 5 MEDITS international standard files (TA, TB, TC, TE and TL) using the VIVALDI software, designed by Ifremer:

https://archimer.ifremer.fr/doc/00426/53780/54667.pdf

Data capture documentation:

The MEDITS survey sampling design has been validated by the international WG and is described in the survey protocol manual:

https://archimer.ifremer.fr/doc/00117/22783/

Quality checks documentation:

'Y' (yes)

1- Software Allegro Campagnes and TUTTI controller:

https://wwz.ifremer.fr/emh/Outils/Allegro-Campagnes-Logiciel-de-saisie-de-donnees-d-operations-et-de-captures-au-cours-des-campagnes-halieutiques-projet-Tutti

2- International routines are used to check the quality of the data (RoME routines)

https://www.coispa.it/index.php?option=com_content&view=article&id=25&Itemid=149&lang=en

Data storage

National database:
1- Data are stored in HARMONIE database (IFREMER) and can be extracted directly from the website. These are basic data collected and computed to the sampling operation (generally a haul) and organized according to geographic units defined in relation to the sampling plan.

Considering the Gulf of lions data (GSA7), the data can be found on the following website:
http://www.ifremer.fr/SIH-indices-campagnes/source/source.action?facade=mediteranee&zone=gdl

Considering Eastern Corsica data (GSA8), the data can be found on the following website:

http://www.ifremer.fr/SIH-indices-campagnes/source/source.action?facade=mediteranee&zone=ecorse

2- For detailed data, the request has to be adressed to:

harmonie@ifremer.fr

International database:

MEDITS has no international database available.

Quality checks and data validation documentation:

Quality checks are realized at different levels:

1- National level with the softwares TUTTI controller and COSER: https://wwz.ifremer.fr/emh_eng/Tools/COSER-COntroles-et-SElections-pour-R-SUFI

2- International level with R routines of the programme RoME https://www.coispa.it/index.php?option=com_content&view=article&id=25&Itemid=149&lang=en

Sample storage

Storage description:

The whole haul catches is analysed on board, no storage.

Sometimes a few individuals are frozen or stored in ethanol (70%) to be sent to experts (if uncertainty on identifications).

Sample analysis:

Microscope to validate species identifications.

Data processing

Evaluation of data accuracy (bias and precision):

The data are sent annually to European Commission via a data call and are analyzed during the STECF European Commission working groups (EWG).

Editing and imputation methods:

'Y' (yes)

Quality document associated to a dataset:

Only a DOI of the survey for metadata:

https://doi.org/10.18142/7

Validation of the final dataset:

Quality checks are done at different levels:

1- National level with the software TUTTI Controller and COSER: https://wwz.ifremer.fr/emh_eng/Tools/COSER-COntroles-et-SElections-pour-R-SUFI

2- International level with R routines of the programme RoME

https://www.coispa.it/index.php?option=com_content&view=article&id=25&Itemid=149&lang=en

Scientific survey – ORHAGO_Q4_FRA

MS .....: FRA
Region.....: North-East Atlantic
Sampling scheme identifier ....: ORHAGO_Q4_FRA
Sampling scheme type.....: Research survey at sea
Observation type .....: SciObsAtSea
Time period of validity.....: 2022-2024
The Bay of Biscay ORHAGO beam trawl survey aims to collect data on composition, distribution and change in relative abundance of benthic fish fauna on the continental shelf (<100m) on a yearly basis (quarter 4).

Description of the population

Population targeted:

The survey area is the Bay of Biscay. Information is collected on length frequency for all the fish, with biological information (age, maturity) for some species. The main target species is sole, other abundant commercial species include (top 10 by decreasing numbers/hour in 2015): Norway lobster, hake, brown shrimp, cuttlefish, horse mackerel, common whelk, common spider crab, small-spotted catshark, greater weever and common prawn. Since 2013, the benthos is exhaustively sampled for all the hauls (for determination at the laboratory).

Population sampled:

The survey targets benthic fish fauna on the continental shelf with a focus on young sole adults (ages 2 to 4) to draw a abundance index for the stock assessment of the sole in the Bay of Biscay.

Stratification:

Fixed station design : The fixed station survey was defined according to information on sole fishing areas. Hauls were provided by fishers. Station positions were selected to have a uniform coverage of the sole fishing area by one or two hauls in two-thirds (48 out of 72) of the 10′ latitude by 10′ longitude rectangles of the fishing area. Four strata are defined. Their weights are the surface of the sole habitat estimated by the fishing area (in number of 10′ latitude by 10′ longitude rectangles). In each stratum, the sampling effort is planned in proportion to the surface area of the sole fishing ground in the Bay of Biscay.

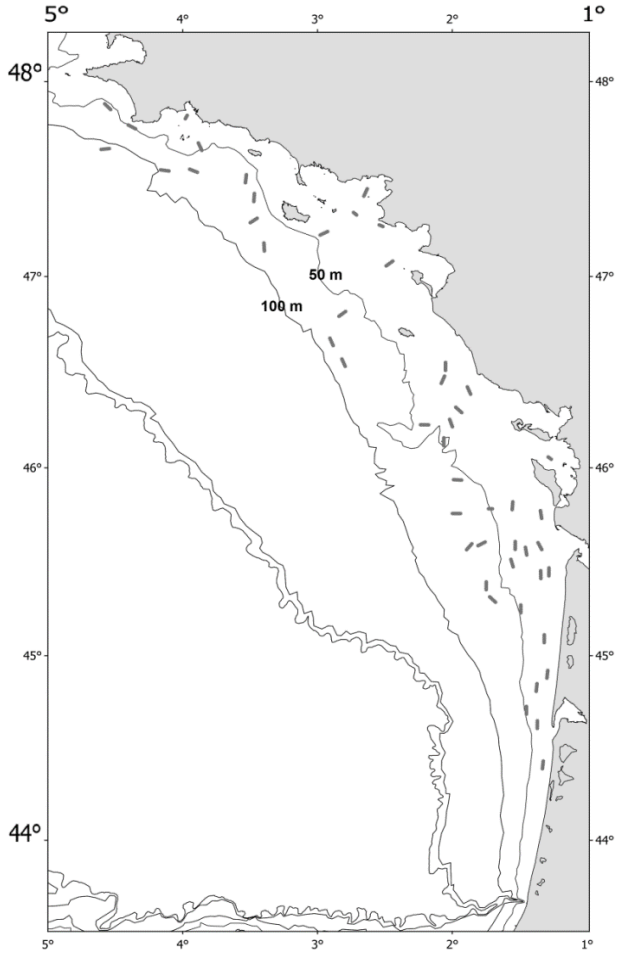
Sampling design and protocols

Sampling design description:

The ORHAGO survey was launched in 2007 to fulfill the need of a fishery independent abundance index for the Bay of Biscay sole stock which has been pointed out since many years by successive ICES WG and their review groups and as well as in ICES advice.

Since 2011, in accordance with ICES agreed gear for flatfish abundance surveys , the gear is 4m-beam trawl with chain mat, 50mm mesh in the net and 40 mm mesh in the cod-end.

The sampling plan was designed to ensure full coverage of the sole habitat in the Bay of Biscay during a period (November-December) for which fish behaviour and distribution was suitable for obtaining an unbiased abundance index (young fish move offshore when coastal waters become colder and before the concentrations of the spawning season). The sampling design is a systematic sampling with 49 reference stations. The design was validated in 2013 by the ICES WGBEAM working group.



ORHAGO_Q4_FRA French survey sampling scheme

Is the sampling design compliant with the 4S principle?

NA (research survey)

Regional coordination:

NA. No regional coordination

Link to sampling design documentation:

The ORHAGO survey is coordinated by the ICES Working Group on Beam Trawl Surveys (WGBEAM) and follows the guidelines which come from this group. The annual report of the ICES WGBEAM is available at https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37577

Compliance to international recommendations:

Y. It follows the guidelines of the ICES WGBEAM.

Link to sampling protocol documentation:

The annual report of the ICES WGBEAM is available at:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37577

Compliance to international recommendations:

Y. The WGBEAM has approved the calculation method for the Bay of Biscay sole stock abundance index at its 2013 meeting (daylight hauls for a set of reference stations). The same year, an interim benchmark approved the inclusion of the ORHAGO survey in the Bay of Biscay sole stock assessment. Since 2013, the ORHAGO survey has consequently been used to assess the status of this stock (WGMMM in 2013, WGBIE in 2014 to 2021).

Sampling implementation

Recording of refusal rate:

NA (research survey)

Monitoring of sampling progress within the sampling year:

NA (research survey)

Data capture

Means of data capture:

We use electronic ichtyometer to measure fish connected via Bluetooth to a software (Allegro Campagnes) which was designed by IFREMER and subcontractors.

All the data are stored in this software:

1. Positions of hauls, depth, distance
2. Characteristics of the net: vertical and horizontal openings,
3. Temperature and salinity
4. Catch

Data capture documentation:

Reports are available at https://campagnes.flotteoceanographique.fr/series/23/

Quality checks documentation:

Y. Data are checked by specific software designed to detect outliers in data (e.g. length size):

https://wwz.ifremer.fr/emh/Outils/Allegro-Campagnes-Logiciel-de-saisie-de-donnees-d-operations-et-de-captures-au-cours-des-campagnes-halieutiques-projet-Tutti

Data storage

National database:

IFREMER hosts the data in the Harmonie database https://sih.ifremer.fr/

International database:

ICES hosts the data in the datras database: https://www.ices.dk/data/data-portals/Pages/DATRAS.aspx

Quality checks and data validation documentation:

A first series of checks is performed when the data is uploaded in the Harmonie database. A second series of checks is performed when the data is uploaded from Harmonie database to the Datras database.

Sample storage

Storage description:

The whole haul catches is analysed on board, no storage.

For specific research projects, few individuals or muscle pieces can be frozen. Some individuals can be stored in ethanol (70%) to be sent to experts for identification.

Sample analysis:

No sample analysis on board excepted dissection for sexual maturity and otoliths sampling. Fish samples are processed onboard to derive biological data described in the survey protocols manual:

http://doi.org/10.17895/ices.pub.5353.

Data processing

Evaluation of data accuracy (bias and precision):

Y. Each year, the WGBIE evaluates the data.

Editing and imputation methods:

NA

Quality document associated to a dataset:

Y. https://doi.org/10.18142/23

Thus, each year, the WGBIE produces a report available at:
https://www.ices.dk/sites/pub/Publication%20Reports/Forms/DispForm.aspx?ID=37577

Validation of the final dataset:

Y. The final dataset is validated by the WGBIE.

Scientific survey – SAHMAS

MS .....: FRA
Region.....: North-East Atlantic
Sampling scheme identifier ....: SAHMAS
Sampling scheme type.....: Research survey at sea
Observation type .....: SciObsAtSea
Time period of validity.....: 2022-2024
The PELGAS survey is the French contribution to the international Sardine, anchovy, horse mackerel acoustic survey (SAHMAS) in the Bay of Biscay. The PELGAS survey aims at monitoring the Bay of Biscay pelagic ecosystem, in order to provide scientific data for implementing an ecosystem-based management of Biscay living resources. The spatial and temporal dynamics of small pelagic fish populations are specifically monitored.

Description of the population

Population targeted:

Anchovy and sardine are the survey target species

Population sampled:

The survey takes place in spring, during anchovy and sardine spawning, to allow for the assessment of both eggs and adult stages. It will cover the Bay of Biscay continental shelf from 43.5°N to 48°N, not including the Cantabrian Sea.

To our knowledge, the Bay of Biscay sardine population will be exhaustively sampled by the survey. The Bay of Biscay anchovy population will be quasi-exhaustively sampled, except for the population units potentially located on the Eastern/Central Cantabrian Sea continental shelf.

Other small pelagic fish, including horse mackerel, sprat, boarfish, blue whiting and mackerels found in the survey area will also be sampled.

Stratification:

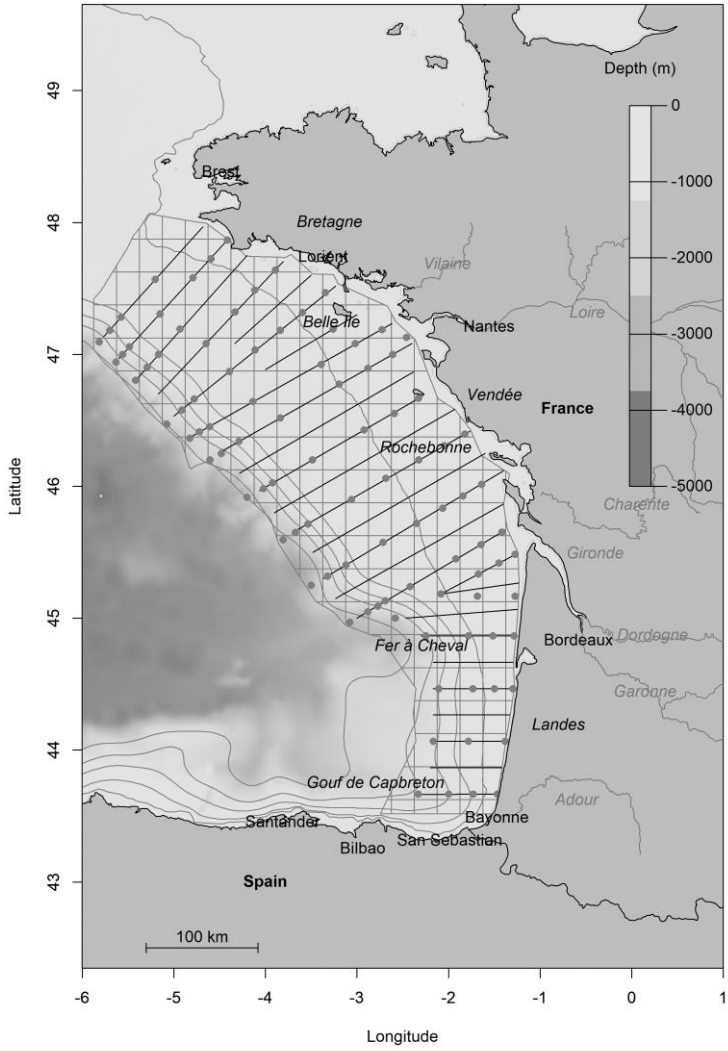
The survey area is sampled as a single strata. It is subsequently post-stratified based on species and length class distributions to improve acoustic biomass estimates precision (see details in the survey protocols manual: https://doi.org/10.17895/ices.pub.7462).

Sampling design and protocols

Sampling design description:

The PELGAS survey is internationally coordinated by the ICES WGACEGG working group. Methods have been validated by WGACEGG and are described in details in the survey protocols manual: https://doi.org/10.17895/ices.pub.7462

The survey is performed in May onboard Research Vessel Thalassa. Data are collected continuously during daytime along 27 parallel transects covering the whole Bay of Biscay. Multibeam and multifrequency (6 frequencies) echosounders provide real time information on the spatial patterns and abundance of small pelagic fish. Simultaneously, a Continuous Fish Eggs Sampler (CUFES) provide complementary information on anchovy and sardine eggs. The presence and abundance of seabirds and marine mammals are also continuously recorded along transects during daytime. The species composition of fish school echoes are identified by midwater trawling, performed in an adaptative manner. CTD stations and zooplankton net casts are performed at night at fixed locations to characterize the small pelagic fish biotic and abiotic environment.



PELGAS survey sampling scheme. Black lines: daytime transects, red dots: night-time hydrobiological stations.

Is the sampling design compliant with the 4S principle?

NA (research survey)

Regional coordination:

The PELGAS survey sampling design and protocols are internationally coordinated by the ICES WGACEGG working group, including representatives from Portugal, Spain, France, UK and Ireland.

Link to sampling design documentation:

The PELGAS survey sampling design has been validated by the ICES WGACEGG working group and is described in the survey protocols manual:

https://doi.org/10.17895/ices.pub.7462

Compliance to international recommendations:

Y.

Link to sampling protocol documentation:

The PELGAS survey sampling protocol has been validated by the ICES WGACEGG working group and is described in the survey protocols manual:

https://doi.org/10.17895/ices.pub.7462

Compliance to international recommendations:

Y

Sampling implementation

Recording of refusal rate:

NA (research survey)

Monitoring of sampling progress within the sampling year:

NA (research survey)

Data capture

Means of data capture:

Acoustic data are recorded in real time and processed using the MOVIES3D software (https://gitlab.ifremer.fr/fleet/movies/pymovies_3d/-/wikis/MOVIES3D).

CUFES samples are processed onboard using the Zoocam egg and mesozooplankton scanner system, which allows for the semi-automatic identification and counting of anchovy and sardine eggs. Fish biological samples are analysed and recorded at sea using BigFin measuring boards and Allegro software, including anchovy and sardine age readings.

Data capture documentation:

The PELGAS survey data capture and processing protocols have been validated by the ICES WGACEGG working group and are described in the survey protocols manual: https://doi.org/10.17895/ices.pub.7462

Quality checks documentation:

Y. The PELGAS survey quality check protocols have been validated by the ICES WGACEGG working group and are described in the survey protocols manual:

https://doi.org/10.17895/ices.pub.7462

Data storage

National database:

Acoustic and fishing data, as well as biomass assessment results are stored in the EchoBase (https://echobase.codelutin.com/) national relational database. Fishing data are stored in the Harmonie national database.

International database:

Acoustic and fishing data are shared within the ICES WGACEGG working group. They are being stored in the ICES dedicated database:

https://www.ices.dk/data/data-portals/Pages/acoustic.aspx

Anchovy, sardine, mackerels, horse mackerels, blue whiting and boarfish biomass estimates derived from data collected during PELGAS are provided to ICES stock assessment groups (WGHANSA and WGWIDE).

Quality checks and data validation documentation:

ICES database validation rules are available at:

https://acoustic.ices.dk/validationrules

Sample storage

Storage description:

Otoliths are embedded in resin on black plaques during the survey.

Zooplankton and ichtyoplankton samples are fixed and buffered in 4% formaldehyde and seawater.

All samples are stored at the Ifremer Atlantic center in Nantes.

Sample analysis:

Fish samples are processed onboard to derive biological data described in the survey protocols manual:

https://doi.org/10.17895/ices.pub.7462. Anchovy and sardine age determination is conducted onboard, based on otoliths samples.

Zooplankton and ichtyoplankton samples are scanned onboard with the ZooCam imager. Image analysis and semi-automated classification of major taxons (mesozooplankton and fish eggs) are performed during the survey based on ZooCam images.

Details on sample analysis are provided in the survey protocols manual:

https://doi.org/10.17895/ices.pub.7462.

Data processing

Evaluation of data accuracy (bias and precision):

The PELGAS survey data accuracy is validated by the ICES WGACEGG working group. Precision calculations are described in the survey protocols manual:

https://doi.org/10.17895/ices.pub.7462

Bias in biomass estimate are assessed by comparing indices derived from acoustic and egg data.

Editing and imputation methods:

Y. Metadata, acoustic and fishing data are combined using the EchoR R package, to derive small pelagic fish biomass estimates, length and age distributions and maps. Editing and imputation methods are described in the survey protocols manual:

https://doi.org/10.17895/ices.pub.7462

Quality document associated to a dataset:

The PELGAS survey estimation process is validated by the ICES WGACEGG working group and documented in the group annual reports available at:

https://www.ices.dk/community/groups/Pages/WGACEGG.aspx

Validation of the final dataset:

The PELGAS survey final dataset are validated annually by the ICES WGACEGG working group.

Scientific survey – IBWSS

MS: FRA
Region: North-East Atlantic
Sampling scheme identifier: IBWSS
Sampling scheme type: Research survey at sea
Observation type: SciObsAtSea
Time period of validity: 2004 to present
France does not conduct this survey but participates to this survey through a cost sharing agreement both with Ireland and Netherlands. ***Thus, regarding IBWSS, quality reports are detailed in Ireland national workplan and Netherlands national work plans.*** The main objective of the International blue whiting spawning stock survey is to determine the age stratified abundance and distribution of blue whiting (Micromesistius poutassou) using acoustic survey techniques. Biological data are collected by means of directed trawling on echotraces to determine species composition and biological characteristics of target species. Directed trawling is carried out on echotraces thought to contain mesopelagic fish species as the survey builds capacity towards reporting abundance and distribution of key fish species. Oceanographic data are collected using vertical profiles at pre-determined locations along the survey cruise track. Visual abundance surveys for marine mammals and seabirds are conducted during daylight hours.

Commercial fishing trip - Obsmer

MS .....: FRA
Region.....: North Sea and Eastern Arctic, North-East Atlantic, Mediterranean and Black Sea
Sampling scheme identifier ....: ObsMer
Sampling scheme type.....: Commercial fishing trip
Observation type .....: SciObsAtSea
Time period of validity.....: from July 2020 onward

Short description: ObsMer is the name of the sampling programme at-sea in France covering all regions mainland except Corsica, which is covered with the DACOR sampling scheme. ObsMer is the acronym of 'Observation en mer' which translates as observation at sea. The objective of the sampling scheme is to monitor commercial fisheries catches, whether landed or discarded, through number, weight and length measurement per species in order to better understand the interactions between fishing activity and marine resources and ecosystems.

The objective of the sampling scheme is to monitor catch quantities by species and biological data from individual specimens, to enable the estimation of volume and length frequency, as well as biological variables such as individual age, sex, weight and maturity, for each catch fraction for the selected species and management area listed in Table 2.1.

The sampling programme, together with ObsVentes sampling scheme, has been totally redesigned from July 2020 onward to better align with the 4S principle and for a better integration with the on-shore ObsVentes programme. Both ObsMer and ObsVentes are coordinated by Ifremer under the supervision of the French Directorate for Fisheries (DPMA) and are operated on the field by subcontractors. The programme covers the major fisheries in mainland France (except Corsica).

The ObsMer programme is described in a flyer available to all stakeholders and a short description in a dedicated webpage.

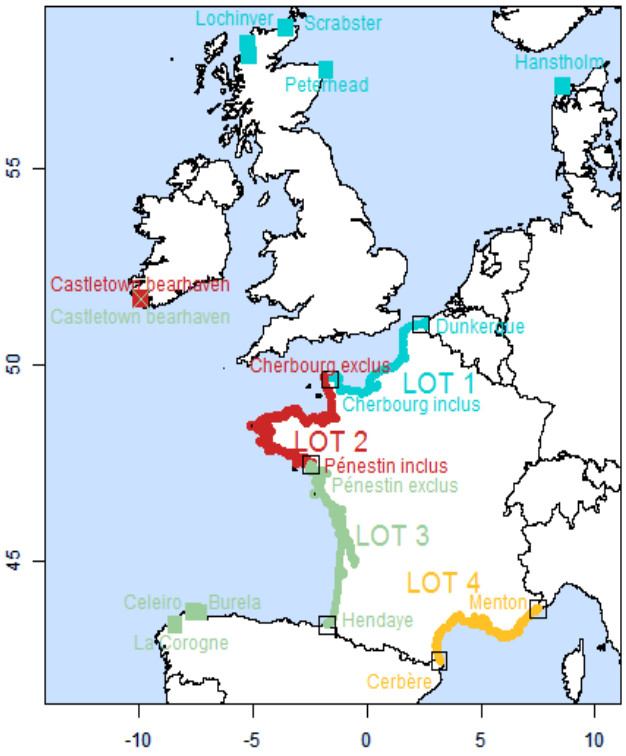
DESCRIPTION OF THE POPULATION

Population targeted: The population targeted is comprising the main fleets operating in mainland France (excl. Corsica) and catching species listed in table 2.1.

Population sampled: The population sampled is a selected list of vessels enabling observers on board with all safety guarantees (mainly all vessels >12m and a number of smaller vessels) as annually validated by the French fisheries authorities.

As out-of-frame, the sampling scheme excludes the vessels not authorising observers on-board for security reasons (e.g. smallest vessels) and fleets targeting exclusively non-European shared species (e.g. whelks, small inshore shellfish, …) and some fleets with marginal discarding such as large crustaceans potters or small liners targeting seabass, which are then fully covered by the ObsVentes sampling scheme.

Stratification: ObsMer mainland is stratified in 4 geographical lots, including embarking on larger French vessels from foreign harbours, as shown in the figure below and then by fleets and quarters.



SAMPLING DESIGN AND PROTOCOLS

Sampling design description: The sampling scheme consists of a number of observers going out to sea on professional fishing vessels, according to a sampling plan that is stratified geographically, temporally and technically to meet the requirements of the national work plan (NWP) for data collection under the EU-MAP Regulation. The observers record the conditions under which the trip is monitored (gear used, GPS positions, etc.) and identify the species caught (identification by scientific name) and quantify and measure these species (weight, number, size). Observations are made on the following three catch fractions:

- Commercial fraction: fraction kept on board with the aim of being landed and marketed;
- Fraction not intended for human consumption: fraction kept on board to be landed and not marketed under the landing obligation;
- Discarded fraction: fraction not kept on board and discarded at sea.

Observation also includes the recording of incidental catches of birds, mammals, reptiles and fish protected under EU legislation and international agreements. The ObsMer sampling design has been elaborated as follows:

Sampling allocation: The primary sampling units (PSU) are the vessels in a quarter of a given year. The total envelope of trips to sample in a year (N ~ 1200) is spread across all strata (sampling frames of fleets) based on the volume of landings or Regulatory prerequisite, when exists, for each of the fleets. As a result, a number of trips to sample (n_{sq}) is attributed to each sampling frame (s) and quarter (q).

Selection of PSUs to sample: The n_{sq} vessels to sample is drawn randomly with replacement from the list of vessels in the sampling frame. This draw is done from the WAO[3] application which will create a page in the application containing the ordered list of vessels to contact. The observers are then tasked with contacting those vessels and entering in the WAO contact page the result of their investigation (refusal, absent or not reachable, ok to embark and sampled trip planned, ok to embark later because of weather, impossible to embark due vessel mechanical or stoppage issue, …). Once the observers have gone through all the contact list and if the number of trips ok to sample is less than n_{sq}, the WAO application authorises a new draw from the list minus those having refused so far (9 month lag before recontacting) and the loop goes on until n_{sq} is reached

Selection of SSUs to sample: The secondary sampling unit (SSU) is a fishing operation with a requirement of proceeding to a systematic-like procedure and spread the sampling of fishing operations evenly during the trip, taking care of the conditions on board and the necessary management of the observer working hours. For each of the sampled fishing operation, 3 fractions are sampled, the retained part for human consumption, the retained part for industrial purpose following the landing obligation and the discarded part. For each of the fraction all or a subsample of the catch is taken for an identification of all species, count and measures of all or a subsample of the total and the weighing of all samples of species.

Data on occurrences (weight and numbers of individuals per species) of incidental catches of all protected sea birds, mammals, reptiles and fish species, as referred to in Union legislation and under international agreements, including those specified in Table 2, and invertebrate benthic species identified as a VME indicators

Is the sampling design compliant with the 4S principle?: Yes, the random draw from a list of vessels as a controlled process embedded within the WAO application is fully compliant with the 4S principle and gives an unbiased estimate of the refusal rate. It is to be noted that, since in place in July 2020, this procedure has provided much more work to the observers in contacting vessel masters but resulted in a significant increase of the number of individual vessels sampled.

Regional coordination: No regional coordination, but the sampling design has been developed following the principles suggested by the series of ICES/WKPICS workshops.

Link to sampling design documentation:

- Fish identification keys : pdf
- Measuring guide : pdf
- Quality document : Annex 1.1

Compliance to international recommendations: Yes. The sampling design is a variant of the option A of the 4S designs detailed in WKPICS3 (ICES, 2014) page 42. The collection of length measurements is in line with international good practice (high number of samples, low number of individuals measured per sample) and international standards as set up by end-users such as ICCAT, ICES and GFCM.

[3] WAO : web application for making the sampling plan available for observers, monitoring the progress of the realisation rate by daily recording of field observations.

ICES. 2014. Report of the third Workshop on Practical Implementation of Statistical Sound Catch Sampling Programmes, 19-22 November 2013, ICES HQ, Copenhagen, Denmark. ICES CM2013/ACOM:54. 109 p

Link to sampling protocol documentation: The sampling protocol is a document on restricted access for observers on the field. Since the whole programme is subcontracted, the sampling protocol was part of the prerequisites for the public call for service.

SAMPLING IMPLEMENTATION

Recording of refusal rate: Yes. The refusal rates are recorded in the WAO application.

Monitoring of sampling progress within the sampling year: A Web Application for Observers (WAO[4]) has been developed for monitoring the sampling in real time and helping the observers on the field knowing the sampling allocations and generating the random draw for species to sample. In the picture below two sampling frames are displayed (M0001 for deep-water fleet and M0002 for passive gear fleet in the lot #1) and the realisation of quarter 3 (T3) is progressing well, 4/8 for M0001 and 14/19 for M0002

Code ligne	Strate	Type de campagne	Société	Flottille	Art de l'engin	Classe de taille	Exclusions métiers	T.3 2021	T.4 2021	Total
2021_M0001 MAJ récente	LOT1_S1_Trainants_AEP_Espèces_profondes	Standard	BV_LR	AEP_Especes_profondes	Trainants	> 30 m		4 / 8	0 / 4	4 / 12 (33 %)
2021_M0002	LOT1_S2_Dormants	Standard	BV_LR	Engins dormants	Dormants		GND_SPF FPO_CEP GNS_CAT FPO_MOL FPO_CRU OTH_EEL FPO_FIF	14 / 19	0 / 11	14 / 30 (47 %)

Monitoring flow and data validation : The WAO application contact page is displayed in the picture below. Only an extract of the contact page is given, to avoid displaying names of vessels and names of observers. In the column Etat (i.e. Status), some hints at the content show

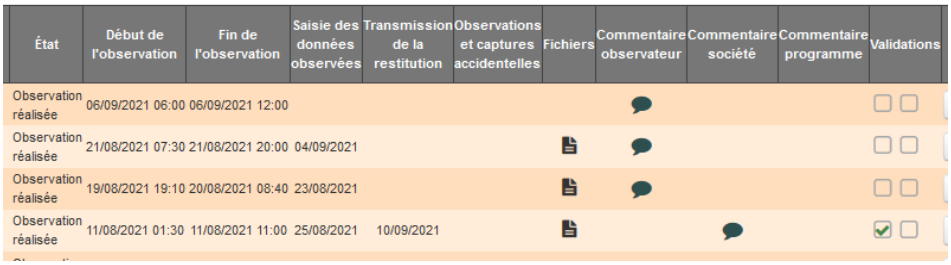
- Contact generated, which means it is ok to embark but the timing of the observation is still not set up;
- Impossibility of embarking with a comment given in the 'Commentaire observateur' column
- Contact taken ('pris') means the phone contacting has begun but without success so far; information is given in the comment column;
- Observation programmed with a date;

[4] WAO :

État	Début de l'observation	Fin de l'observation	Saisie des données observées	Transmission de la restitution	Observations et captures accidentelles	Fichiers	Commentaire observateur	Commentaire société	Commentaire programme	Validations
Contact généré										
Impossibilité d'embarquement										
Impossibilité d'embarquement										
Annulée (météo)										
Contact généré										
Impossibilité d'embarquement										
Contact pris										
Impossibilité d'embarquement										
Impossibilité d'embarquement										
Impossibilité d'embarquement										
Observation programmée	05/09/2021 10:00									

Further on, when the contacts progress and trips are being sampled, the contact line evolves together with the validation process. In the picture below, 3 cases can be detailed:

- 1st line : the sampled trip just occurred, data has not been populated on a computer (column 'Saisie des données observées')
- 2nd and 3rd lines : sampled trips were made, data populated on a computer but not yet transmitted to Ifremer database (column 'Transmission de la restitution'); A file is attached, it is mandatorily the sample forms and optionally pictures; a comment by the observer and/or by the company is optional but promoted as a good practice in general;
- 4th line : sampled trip is made, data populated on a computer and transmitted to Ifremer, together with a first validation tick, which indicates the data are validated for this trip and can now enter the phase of Ifremer validation (2nd tick not yet realised)

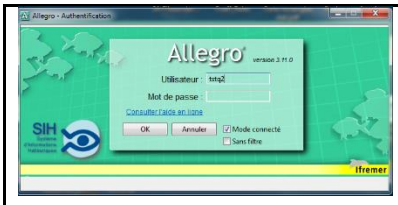


État	Début de l'observation	Fin de l'observation	Saisie des données observées	Transmission de la restitution	Observations et captures accidentelles	Fichiers	Commentaire observateur	Commentaire société	Commentaire programme	Validations
Observation réalisée	06/09/2021 06:00	06/09/2021 12:00								
Observation réalisée	21/08/2021 07:30	21/08/2021 20:00	04/09/2021							
Observation réalisée	19/08/2021 19:10	20/08/2021 08:40	23/08/2021							
Observation réalisée	11/08/2021 01:30	11/08/2021 11:00	25/08/2021	10/09/2021						

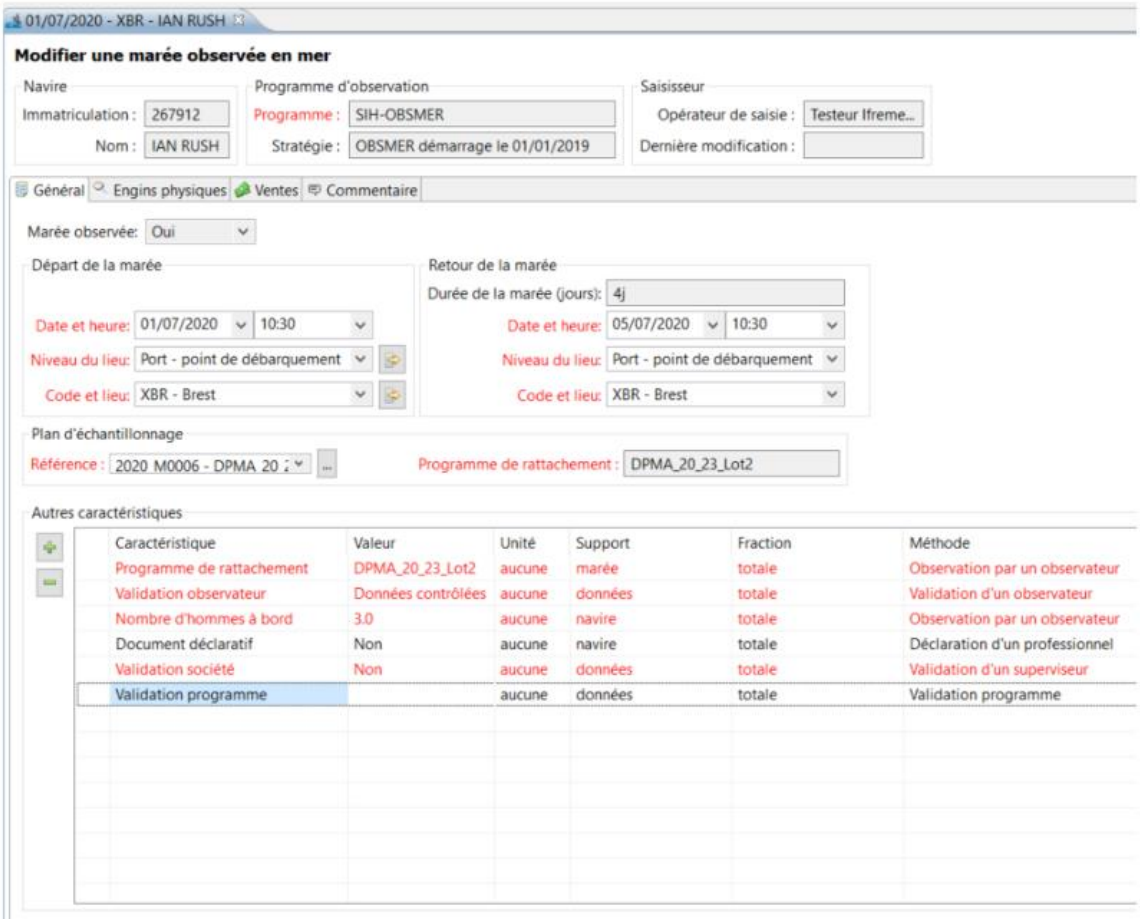
Coordination process: a meeting of a steering group comprising the French Directorate for Fisheries (DPMA), Ifremer, sampling companies and industry representatives is held on a quarterly basis. The mandate of the steering group is to discuss the past quarterly realisation, address the main issues encountered and prepare for the next quarterly plan. All decisions taken are documented in a steering group quarterly report.

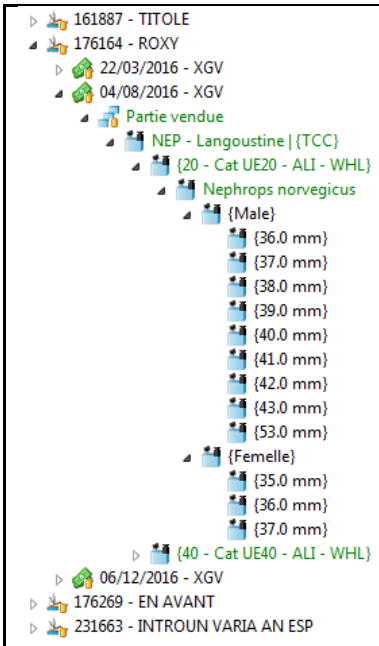
DATA CAPTURE

Means of data capture: The data capture application developed by Ifremer/SIH for all the observers is named ALLEGRO (pictures below). Until now, there is no use of electronic measuring board, only paper filling on the ground and use of ALLEGRO when back at the lab. It is to be noted that the scan of the papers filled during the visit to auction is included in the WAO application on the line referring to the relevant realisation.



Once noted the vessel sampled, the capture of all sampled elements is done using specific screens (below the screen to enter the general elements of the sampled trips and then the screen to enter length measurements)





Data capture documentation: Allegro website

Quality checks documentation: No. Under development.

DATA STORAGE

National database: The Ifremer/SIH database is named HARMONIE. There is no link directly to HARMONIE but to its data catalogue.

International database: The French ObsMer primary data are now uploaded in the RCG RDB hosted by ICES.

Quality checks and data validation documentation: Quality checks are developed at every stage of the data life cycle. At first, the data capture tool (ALLEGRO) includes basic QC, then the data storage (HARMONIE) when synchronizing with ALLEGRO; those potential errors are then dealt between Ifremer and the ObsVentes subcontractors before being formally validated by Ifremer ObsVentes team. In order to help in this validation stage, a R script has been developed, is currently being improved and will be available through a web application in 2022. Eventually, some errors may be detected when processing data for end-user purposes. Ifremer extensively uses the COST libraries and the QC as detailed in the fishPi project (EU MARE/2014/19, Annex 18 and 19)

- COST packages and quality checks library : github
- fishPi final document : pdf

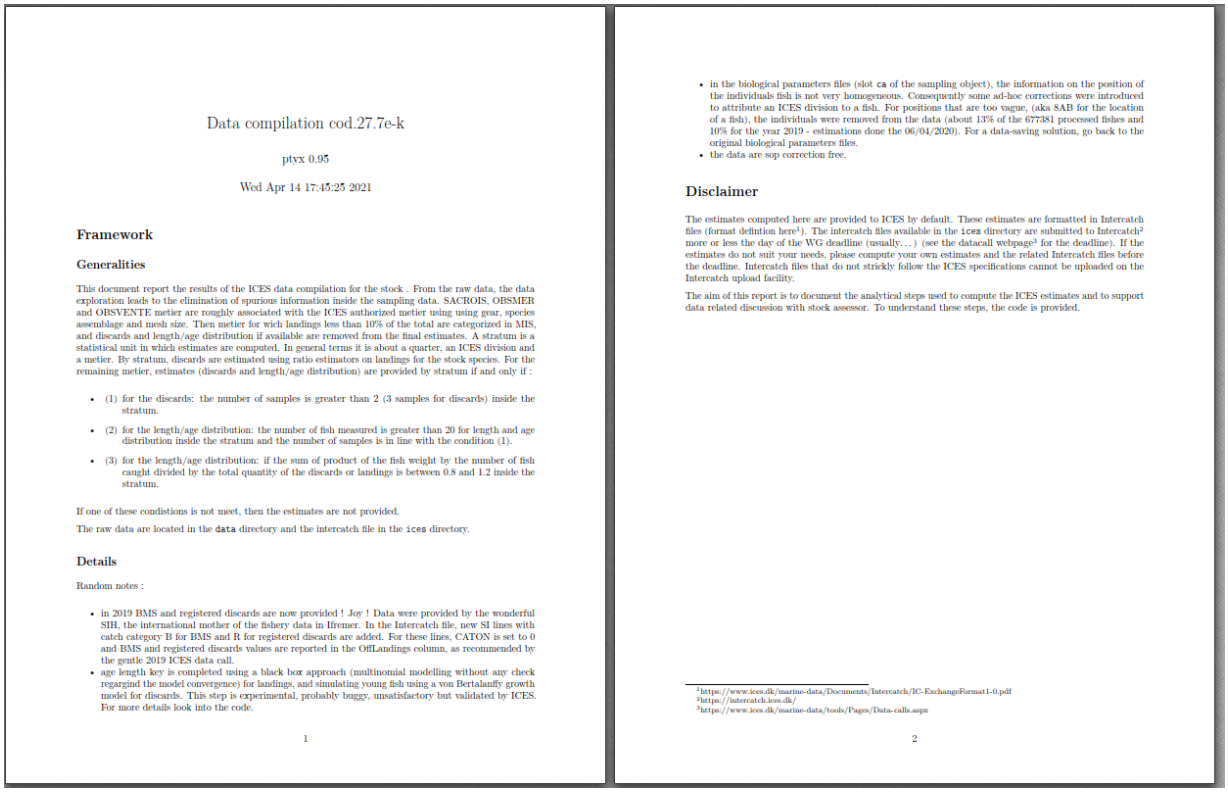
SAMPLE STORAGE

Storage description: In ObsMer programme there is no sample storage of any sort.

Sample analysis: All fish are weighted and measured on site.

DATA PROCESSING

Evaluation of data accuracy (bias and precision): Yes. A quality document is developed for each dataset prepared with the COST libraries. This document is available internally for experts willing to check the outputs before submission and is stored on a shared folder, together with the original datasets and the script used to generate the processed data. There is no literature on the issue, since the generic quality document is a lively document subject to permanent improvement. All elements regarding data accuracy demanded by the end-user are provided within the submitted data forms. Below the first 4 pages of such quality document for the cod VIIe-k dataset provided to ICES/WGCSE 1n 2021.



Data compilation cod.27.7e-k

ptvx 0.95

Wed Apr 14 17:45:25 2021

Framework

Generalities

This document report the results of the ICES data compilation for the stock . From the raw data, the data exploration leads to the elimination of spurious information inside the sampling data. SACROIS, OBSMER and OBSVENTE metier are roughly associated with the ICES authorized metier using using gear, species assemblage and mesh size. Then metier for wich landings less than 10% of the total are categorized in MIS, and discards and length/age distribution if available are removed from the final estimates. A stratum is a statistical unit in which estimates are computed. In general terms it is about a quarter, an ICES division and a metier. By stratum, discards are estimated using ratio estimators on landings for the stock species. For the remaining metier, estimates (discards and length/age distribution) are provided by stratum if and only if :

- (1) for the discards: the number of samples is greater than 2 (3 samples for discards) inside the stratum.
- (2) for the length/age distribution: the number of fish measured is greater than 20 for length and age distribution inside the stratum and the number of samples is in line with the condition (1).
- (3) for the length/age distribution: if the sum of product of the fish weight by the number of fish caught divided by the total quantity of the discards or landings is between 0.8 and 1.2 inside the stratum.

If one of these condistions is not meet, then the estimates are not provided.

The raw data are located in the `data` directory and the intercatch file in the `ices` directory.

Details

Random notes :

- in 2019 BMS and registered discards are now provided ! Joy ! Data were provided by the wonderful SIH, the international mother of the fishery data in Ifremer. In the Intercatch file, new SI lines with catch category B for BMS and R for registered discards are added. For these lines, CATON is set to 0 and BMS and registered discards values are reported in the OffLandings column, as recommended by the gentle 2019 ICES data call.
- age length key is completed using a black box approach (multinomial modelling without any check regargind the model convergence) for landings, and simulating young fish using a von Bertalanffy growth model for discards. This step is experimental, probably buggy, unsatisfactory but validated by ICES. For more details look into the code.

1

- in the biological parameters files (slot `ca` of the sampling object), the information on the position of the individuals fish is not very homogeneous. Consequently some ad-hoc corrections were introduced to attribute an ICES division to a fish. For positions that are too vague, (aka SAB for the location of a fish), the individuals were removed from the data (about 13% of the 677381 processed fishes and 10% for the year 2019 - estimations done the 06/04/2020). For a data-saving solution, go back to the original biological parameters files.
- the data are sop correction free.

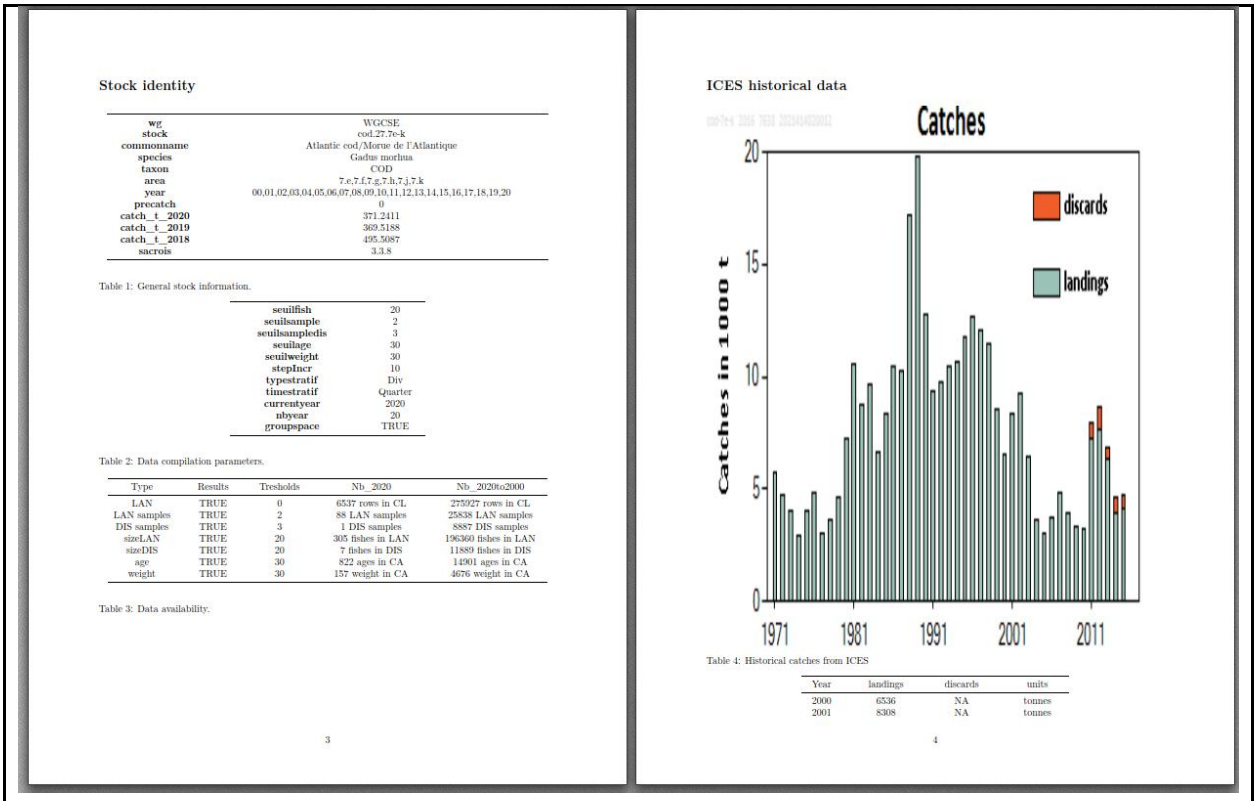
Disclaimer

The estimates computed here are provided to ICES by default. These estimates are formatted in Intercatch files (format defintion here[1]). The intercatch files available in the `ices` directory are submitted to Intercatch[2] more or less the day of the WG deadline (usually...) (see the datacall webpage[3] for the deadline). If the estimates do not suit your needs, please compute your own estimates and the related Intercatch files before the deadline. Intercatch files that do not strickly follow the ICES specifications cannot be uploaded on the Intercatch upload facility.

The aim of this report is to document the analytical steps used to compute the ICES estimates and to support data related discussion with stock assessor. To understand these steps, the code is provided.

[1] https://www.ices.dk/marine-data/Documents/Intercatch/IC-ExchangeFormat1-0.pdf
[2] https://intercatch.ices.dk/
[3] https://www.ices.dk/marine-data/tools/Pages/Data-calls.aspx

2



Stock identity

wg	WGCSE
stock	cod.27.7e-k
commonname	Atlantic cod/Morue de l'Atlantique
species	Gadus morhua
taxon	COD
area	7.e,7.f,7.g,7.h,7.j,7.k
year	00,01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20
precatch	0
catch_t_2020	371.2411
catch_t_2019	369.5188
catch_t_2018	495.5087
sacrois	3.3.8

Table 1: General stock information.

seuilfish	20
seuilsample	2
seuilsampledis	3
seuilage	30
seuilweight	30
stepIncr	10
typestratif	Div
timestratif	Quarter
currentyear	2020
nbyear	20
groupspace	TRUE

Table 2: Data compilation parameters.

Type	Results	Tresholds	Nb_2020	Nb_2020to2000
LAN	TRUE	0	6537 rows in CL	275927 rows in CL
LAN samples	TRUE	2	88 LAN samples	25838 LAN samples
DIS samples	TRUE	3	1 DIS samples	8887 DIS samples
sizeLAN	TRUE	20	305 fishes in LAN	196360 fishes in LAN
sizeDIS	TRUE	20	7 fishes in DIS	11889 fishes in DIS
age	TRUE	30	822 ages in CA	14901 ages in CA
weight	TRUE	30	157 weight in CA	4676 weight in CA

Table 3: Data availability.

3

ICES historical data

Table 4: Historical catches from ICES

Year	landings	discards	units
2000	6536	NA	tonnes
2001	8308	NA	tonnes

4

Editing and imputation methods: Yes. In the same document as above. Metiers and areas are grouped by proximities and similarities to the main item as demanded by the end-user (see extract of the document below for metier grouping). The differing metiers and areas are left unchanged and provided without sampling if not enough samples or fish have been collected for the stratum (threshold [seuil in French] are varying by stock and an example is shown in table 1 on the picture above). SOP are estimated for all strata but no SOP correction is done, except for those not accepted by the end-user, e.g. must be in the range [0.8 – 1.2] for ICES. In these cases the SOP correction is done to 0.8 for those inferior to this value and to 1.2 for those superior. The method is thus transparent for the stock coordinator who will understand the quality of the data for all strata.

Metier stratification

final	foCatEu6	wlan	nlan	ndis
OTB_DEF_100-119_0_0	OTB_CEP_100_119_0 OTB_DEF_100_119_0 PTB_DEF_100_119_0	94.56 (29902.61)	4 (3137)	0 (355)
OTT_DEF_100-119_0_0	OTT_CEP_100_119_0 OTT_DEF_100_119_0	96.33 (9958.46)	6 (3103)	0 (198)
OTB_DEF_70-99_0_0	OTB_CEP_70_99_0 OTB_DEF_70_99_0 PTB_DEF_70_99_0	55.29 (8870.76)	38 (1195)	1 (89)
MIS_MIS_0_0_0	other	18.38 (2219.04)	2 (1883)	0 (258)
OTT_CRU_100-119_0_0	OTT_CRU_100_119_0	3.3 (4864.47)	31 (1377)	0 (151)
GTR_DEF_>=220_0_0_all	GTN_DEF_>=220_0 GTR_CEP_>=220_0 GTR_DEF_>=220_0	3.27 (380.74)	0 (416)	0 (187)
OTB_CRU_100-119_0_0_all	OTB_CRU_100_119_0 PTB_CRU_100_119_0	0.1 (2943.11)	0 (400)	0 (47)
OTB_CRU_70-99_0_0_all	OTB_CRU_70_99_0 PTB_CRU_70_99_0	0.01 (442.3)	0 (194)	0 (59)
OTM_DEF_100-119_0_0_all	OTM_DEF_100_119_0 OTM_LPF_100_119_0 PTM_DEF_100_119_0 PTM_LPF_100_119_0	0.01 (221.34)	0 (2)	0 (1)

Quality document associated to a dataset: Yes. Same as above.

Validation of the final dataset: France sends hundreds of datasets to various end-user on a yearly basis. Only the major stocks and major data calls have a process of validation before sending. This topic is a case for concern and methods are constantly improved, workforce and tools are currently being reinforced to improve the current situation.

Commercial fishing trip - ObsAuto

MS .....: FRA
Region.....: North Sea and Eastern Arctic, North-East Atlantic
Sampling scheme identifier ....: ObsAuto
Sampling scheme type.....: Commercial fishing trip
Observation type .....: SelfAtSea
Time period of validity : from 2022 onward

Short description: Self-sampling onboard commercial vessels is carried out for providing length structures of key species, which would be too costly to monitor at-sea with an observer because of long trip duration and impossible on-shore since the fish is processed on-board. The two key species subject to self-sampling monitoring by the vessel crew are the blue whiting (*Micromesistius poutassou*) in ICES areas V, VI, VII and VIII and cod (*Gadus morhua*) in ICES I, II, IV. The sampling is mainly designed to provide length structures of the catches or landings of the key species.

Vessel targeting blue whiting in the North East Atlantic

Vessel targeting gadoids in the North Sea and Eastern Arctic

Description OF the population

Population targeted: The population targeted are the

- Blue whiting (*Micromesistius poutassou*) catches in ICES areas V, VI, VII and VIII
- Cod (*Gadus morhua*) landings in ICES I, II, IV

Population sampled: The population sampled are the catches of a large vessel (90.5 m. LOA) processing blue whiting on-board for preparing surimi base and the landings of a freezer trawler (81 m.) fileting and freezing cod on-board. There are no vessels out of this frame.

Stratification: None, all the trips of the considered vessels are monitored with self-sampling.

SAMPLING DESIGN AND PROTOCOLS

Sampling design description: Sampling protocols are developed together with the crew of the commercial fishing vessels and adapted to its situation.
For blue whiting, 30 individuals are measured every 6 hours taken randomly from the total catch before the fish enters the vessel factory. The uptake of the 30 fish must be divided in 3 portions, one at the

beginning of the arrival of the fish in the trunk, one in the middle and one at the end. The sampled weight is also taken.
For cod, 45 individuals are measured every day, divided in 3 portions, one at the beginning of the sorting, one in the middle and one at the end. The sampled weight is also taken.

Sampling allocation: all fishing trips are monitored

Selection of PSUs to sample: all fishing trips are monitored

Selection of SSUs to sample: left to the discretion of the crew

Is the sampling design compliant with the 4S principle?: NA - all fishing trips are monitored.

Regional coordination: No regional coordination, but the sampling design has been developed following the principles suggested by the series of ICES/WKPICS workshops.

Link to sampling design documentation: Under development – will be available in 2022.

Compliance to international recommendations: Yes, sampling design has been developed following the principles suggested by the series of ICES/WKPICS workshops.

Link to sampling protocol documentation: Not yet available - will be available in 2022.

Compliance to international recommendations: The collection of length measurements is in line with international good practice (high number of samples, low number of individuals measured per sample (<50)) and international standards as set up by ICES, the main end-user.

Sampling implementation

Recording of refusal rate: Self sampling at sea is based on voluntary participation of the vessel's master and crew.

Monitoring of sampling progress within the sampling year: Each vessel operates a few trips per year (4-6) and the data sets are sent at every return to the harbour.

A meeting of a steering group comprising the French Directorate for Fisheries (DPMA), Ifremer, sampling companies and industry representatives is held on a quarterly basis. The mandate of the steering group is to discuss the past quarterly realisation, address the main issues encountered and prepare for the next quarterly plan. All decisions taken are documented in a steering group quarterly report.

Data capture

Means of data capture: The data capture is done on an Excel sheet, which is given to be the easiest means for the crew. An application is currently under development to improve the quality checks and exportation to the Harmonie database.

The crews are provided with measurement rulers, scales for weighting the fish and empty forms. The crew captures the data in an excel sheet and eventually sends the file to Ifremer.

Data capture documentation: Under development

Quality checks documentation: Quality check is done by the Ifremer expert receiving the data, before the new application is implemented.

Data storage

National database: The excel files are stored in a shared folder and data are not yet stored in a database.

International database: None.

Quality checks and data validation documentation: Under development
.

Sample storage

No biological sample taken. Only length and weight are measured through this scheme. There is no storage of any kind.

Data processing

Evaluation of data accuracy (bias and precision): Yes**.** A quality document is developed for each dataset prepared with the COST libraries. This document is available internally for experts willing to check the outputs before submission and is stored on a shared folder, together with the original datasets and the script used to generate the processed data. There is no literature on the issue, since the generic quality document is a lively document subject to permanent improvement. All elements regarding data accuracy demanded by the end-user are provided within the submitted data forms. Below one of the first pages of such quality document for the blue whiting in the North East Atlantic dataset provided to ICES/WGWIDE in 2021.

Stock identity

wg	WGWIDE
stock	whb.27.1-91214
commonname	Blue whiting(=Poutassou)/Merlan bleu
species	Micromesistius poutassou
taxon	WHB
area	12.a,12.b,12.c,2.a,4.a,4.b,4.c,5.b,6.a,6.b,7.a,7.b,7.c,7.d,7.e,7.f,7.g,7.h,7.j,7.k,8.a,8.b,8.c,8.d,8.e,9.a,9.b
year	00,01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20
precatch	12372.28
catch_t_2020	13768.58
catch_t_2019	16087.84
catch_t_2018	16409.86
sacrois	3.3.8

Table 1: General stock information.

seuilfish	20
seuilsample	2
seuilsampledis	3
seuilage	3e+05
seuilweight	30
stepIncr	10
typestratif	Div
timestratif	Quarter
currentyear	2020
nbyear	20
groupspace	FALSE

Table 2: Data compilation parameters.

Type	Results	Tresholds	Nb_2020	Nb_2020to2000
LAN	TRUE	0	200 rows in CL	3310 rows in CL
LAN samples	TRUE	2	63 LAN samples	501 LAN samples
DIS samples	TRUE	3	117 DIS samples	4882 DIS samples
sizeLAN	TRUE	20	3992 fishes in LAN	21593 fishes in LAN
sizeDIS	TRUE	20	1354 fishes in DIS	136657 fishes in DIS
age	FALSE	3e+05	22 ages in CA	2217 ages in CA
weight	TRUE	30	22 weight in CA	2472 weight in CA

Table 3: Data availability.

Editing and imputation methods: Yes. In the same document as above. Metiers and areas are grouped by proximities and similarities to the main item as demanded by the end-user (see extract of the document below for metier grouping). The differing metiers and areas are left unchanged and provided without sampling if not enough samples or fish have been collected for the stratum.

Metier stratification

final	foCatEu6	wlan	nlan	ndis
OTM_DEF_32-69_0_0_all	OTM_DEF_32_54_0 OTM_DEF_32_69_0 OTM_DEF_55_69_0 PTM_DEF_32_54_0 PTM_DEF_32_69_0 PTM_LPF_55_69_0	13759.06 (241378.14)	59 (210)	0 (4)
MIS_MIS_0_0_0	other	9.45 (922.82)	4 (290)	104 (4681)
OTM_DEF_70-99_0_0_all	OTM_DEF_>=70_0 OTM_DEF_70_99_0 OTM_LPF_>=70_0 PTM_DEF_>=70_0 PTM_DEF_70_99_0 PTM_LPF_>=70_0 PTM_LPF_70_99_0	0.07 (14526.83)	0 (0)	0 (65)
OTB_DEF_32-69_0_0	OTB_CEP_32_54_0 OTB_CEP_32_69_0 OTB_CEP_55_69_0 OTB_DEF_32_54_0 OTB_DEF_32_69_0 OTB_DEF_55_69_0	0 (6954)	0 (1)	0 (35)

Table 8: Final metier stratification.

Quality document associated to a dataset: Yes. Same as above**.**

Validation of the final dataset: The final datasets are controlled by the expert participating to the assessment working group before uploading in the ICES database.

Commercial fishing trip – Observe

MS : FRA

Region: Other regions

Sampling scheme identifier: Observe

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: from 2005 onward

The sampling scheme aims at monitoring at sea discards of target species (e.g., tunas, swordfish) and retained and discarded bycatch from the French tropical purse seine fishery operating in the Atlantic and Indian oceans, and the pelagic longline fishery in the Indian Ocean. The sampling scheme covers two tropical regions governed by tunaRFMOs : IOTC and ICCAT.
Sampling is coordinated by IRD and is operationally carried out by subcontractors.

Description of the population

Population targeted:
The targeted population corresponds to the catches (retained and discarded) of commercial purse seine and pelagic longline fishing operations. The primary sampling unit (PSU) is the trip.

Population sampled:
The sampled population is a selected list of the species listed in table 2.1 with a different priority:
1. Discards of target species: yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*), skipjack tuna (*Katsuwonus pelamis*) and albacore tuna (*Thunnus alalunga*) for the purse seine, and swordfish (*Xiphias gladius*) as well as tunas for the pelagic longline.
2. Retained and discarded bycatch species (including all PETS): sharks, rays, turtles, billfishes, marine mammals, and other fish species.

As out of frame, scientific observers are only deployed on a fraction of purse seine and longline vessels. Indeed, some purse seiners in the Indian Ocean do not have room for an observer due to limited room onboard and the presence of private security agents (related to piracy). Also, some longliners (operating in the Indian Ocean) cannot embark observers because they run at full capacity in terms of room onboard, especially smaller vessels (< 12m). To cope with that, "self-reporting" (captains collecting data; see description below) was developed. Finally, having observers onboard is not mandatory and cannot be imposed, therefore some captains refuse to have observers onboard (for personal reason).

Stratification:
The population is stratified in 2 geographical lots: "Atlantic Ocean Central East and West" (FAO areas 34, 41 and 47) and "Indian Ocean" (FAO areas 51 and 57). Each lot is governed by a dedicated tuna RFMO: ICCAT and IOTC, respectively.

Sampling design and protocols

Sampling design description:
Purse seine:
Discards of target species (tropical tunas) and retained and discarded bycatch are monitored by observers at-sea. Observations consist in counting, determining species composition, condition at release (dead or alive), taking length measurements (and weighting when possible), and determining sex (when possible). The observer monitors exhaustively the entire sorting operations. Observations

include the recording of incidental catches of PETS including seabirds, turtles, marine mammals, and fish protected under EU legislation and international agreements.

Longline:

All catches (retained and discarded) of target species (swordfish, tunas) and bycatch species are monitored by observers at-sea. Observations consist in counting, identifying species, condition at release (dead or alive), taking length measurements, determining sex (when possible), and noting depredation by cetaceans and sharks. Observations include the recording of incidental catches of PETS including seabirds, turtles, marine mammals, and fish protected under EU legislation and international agreements. Within the framework of the observer scheme, "self-reporting data" are collected by fishermen themselves and consist of comparable observations (that of scientific observers) excluding measurements.

Is the sampling design compliant with the 4S principle?

Y. The sampling design of PSU can be defined as "non-probabilistic convenience", meaning the trips of only vessels that can embark observers (some cannot due to the lack of place on the vessel) are sampled depending on opportunities, and in a fashion where all fishing companies (that may have different fishing strategies or practises) are represented.

Regional coordination:

No regional cooperation for observation, no agreement ongoing. The sampling scheme is analysed and revised at the occasion of an annual workshop (Observers sub-ISSG) in the frame of RCG Large Pelagic, that includes other scientific institutes using the same methodology (AZTI, Spain and SFA, Seychelles).

Link to sampling design documentation:

There is no specific document made by IRD describing the sampling design. The sampling design is based on the respective Regional Observer Schemes (ROS) of ICCAT and IOTC. The ROS defines the minimum standards and mandatory information to be collected and reported to each RFMO. Also, the sampling scheme complies with the minimum observer coverage required by each RFMO (5%) and required by EU (10%).

Compliance with international recommendations:

Y - observer coverage is in line with EU requirements and with ICCAT and IOCT recommendations.

Link to sampling protocol documentation:

The sampling protocol on purse seine vessels is described in detail in Sabarros P.S. (2020) *Manuel à l'usage des observateurs embarqués à bord des thoniers senneurs tropicaux* (version 2.1)
https://hal.ird.fr/ird-02293012v3/

The sampling protocol pelagic longline vessels is described in detail in Bach P. and Sabarros P.S. (2018) *Manuel de l'observateur embarqué à bord des palangriers réunionnais* (version 2018)
https://www.dropbox.com/s/7qpqzso8avscgf1/Manuel_Obs%20LL%20RUN%202018.pdf?dl=0

A species identification guide was developed at the attention of observers that can be use for both fisheries: Sabarros P.S. and Moussy F. (2020) *Guide d'identification des espèces capturées dans les pêcheries tropicales* (version 2.0)
https://www.dropbox.com/s/90rdjf0rehlanlj/Guide_ID_esp%C3%A8ces_IRD-Ob7_v2.0.pdf?dl=0

Compliance with international recommendations:

Y – sampling protocol is in line with ICCAT and IOCT recommendations.

Sampling implementation

Recording of refusal rate:

N. Refusals for embarking observers is dealt with by the subcontractors that will reschedule on a different date or vessel if needed.

Monitoring of sampling progress within the sampling year:

Purse seine:

The operational sampling is delegated to a subcontractor that informs IRD of upcoming observer deployments. Also, the subcontractor shares online a progress table including past and upcoming observer deployments. Moreover, all observers are debriefed by IRD with the purpose to check that the protocol is carefully followed. Two steering meetings are organized each year with the subcontractor to discuss the sampling plan, progress and any relevant issues or modifications.

Longline:

The operational sampling is delegated to a subcontractor that informs IRD of upcoming observer deployments. Two steering meetings are organized each year with the subcontractor to discuss the sampling plan, progress and any relevant issues or modifications.

Coordination process: For each fishery, two steering meetings are held annually between the subcontractors and IRD. The goal of the steering meeting is to discuss the progress of sampling operations, address the main issues encountered, and prepare the upcoming sampling plan. All discussions and decisions taken are documented in a report.

Data capture

Means of data capture:

IRD has developed a fully-fledged software for entering data collected at sea by observers, named *ObServe*. This software offers scientists and technicians the complete palette of forms required for the entry of all types of data to be collected as part of EU-MAP and during fieldwork in general. Its core purpose is thus to cover the biological sampling and scientific surveys at sea. To ensure high quality for the data prior to their transfer to the central database, the data are pre-validated automatically by applying plausibility criteria consistent with the reference criteria of IRD's Exploited Tropical Pelagic Ecosystems Observatory (active vessels, taxonomic references, reference lists of metiers, etc.). In addition, this software also provides observers with all the documentation required for their data collection activities.

Data capture documentation:

Cauquil P. (2018) *ObServe 7: Système intégré de gestion de données d'observation de pêche à la senne et à la palangre : manuel d'utilisation de l'observateur* (Révision 60 le 20/11/2018), 67 p. multigr. fdi:010082885

Quality checks documentation:

There are different levels of controls for the data. First, data entry controls are part of *ObServe* used by observers. These controls based of reference data are used to constrained data entry to plausible data. Secondly, prior to being sent to IRD, subcontractors control various key elements data entered by their observers and make sure data collected on paper forms is well transcripted digitally in *ObServe*.

Commercial fishing trip – CFDCF

MS : FRA

Region: Mediterranean and Black Sea

Sampling scheme identifier : CFDCF (DACOR)

Sampling scheme type: Commercial fishing trip

Observation type: SciObsAtSea

Time period of validity: 2022 -2024

Short description (max 100 words):

The CF-DCF (Corsican Fisheries-Data Collection Framework) uses the DACOR sampling protocol (Données Halieutiques Corses, Mesure 28 du FEAMP) carried out by Office de l'Environnement de la Corse between 2017 and 2020. It is a sampling scheme at sea which aims at collecting length samples from commercial fisheries (biological data) of small-scale coastal fishing fleets in Corsica (GSA 8). This sampling scheme is specifically adapted to small-scale coastal fisheries and compatible with the OBSMER protocol (see Obsmer dedicated Annex 1.1). When they are caught, all species listed in the EU Map for the Mediterranean Sea are considered and sampled, including discard (alive or dead) and accidental catches.

Description of the population

Population targeted:

The population targeted is all small-scale fleets operating in Corsica and catching species listed in table 2.1. All GSA8 fishing ports are considered in the sampling plan. In the CF-DCF collect, the primary sampling units are "vessel * trip". All species caught in commercial fisheries are sampled at sea including discards (alive or dead), accidental by-catches, PETS, and VME (vulnerable marine ecosystem).

Population sampled:

All small costal fishing vessels >7m using gillnets, long lines, traps or having European license to fish swordfish or tuna and having the permission to embark an observer. As out of this frame,

- vessels less than 7 m in length without a special personnel permit are sampled on shore;
- Trawlers and lagoon fishermen are excluded because they represent a small fraction of the GSA 8 fishing fleet.

Stratification:

The sampling will be based on the global strata of GSA8 and can be divides in 4 spatial sub-strata: the prud'homies of Bastia, Bunifaziu, Aiacciu and Balagna. Each vessel is allocated to a single prud'homie. The distribution of the sample will be randomized and proportional to the number of trips made in the territory, using the previous year's estimated fishing effort as a reference (projet DACOR 2018-2019 and IFREMER data).

Sampling design and protocols

Sampling design description:

All fishermen eligible for at-sea or onshore sampling are contacted at least once a year in order to create a second list of fishermen agreeing for observation. The PSUs are then selected randomly from this second list and observation occur according to the meteorology and availability of the fishermen. The Corsican small-scale coastal fishery is an activity which is mainly practiced from March to December with more frequent trips during the summer period, so the sampling effort is adapted to this seasonality. The objective is to have a representative sampling of the small-scale coastal fishing effort on GSA8

considering the number of PSUs according to the pelagic and demersal gear strata, on the basis of the reference year considered (n-2)

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

Regional coordination:
No regional coordination.

Link to sampling design documentation:
Document available on request from Corsican Environment Office
Santoni M-C., Lanfranchi J-B., Susini S. (2021), Protocole d'échantillonnage Observateur en mer, Projet CF-DCF (DACOR). Office de l'Environnement de la Corse 30p
Sampling protocol is detailed in document available here : https://www.oec.corsica/Un-reseau-d-observateurs-scientifiques-embarques-a-bord-des-navires-de-la-petite-peche-cotiere-de-Corse_a4812.html

Compliance to international recommendations:
The sampling design is in line with MSFD and GFCM DCRF and compatible with OBSMER design.

Link to sampling protocol documentation:
The sampling protocols have been developed in compatibility with the Obsmer protocols. The CF-DCF project uses the DACOR protocol to collect biological data.
Santoni M-C., Lanfranchi J-B., Susini S. (2021), Protocole d'échantillonnage Observateur en mer, Projet CF-DCF (DACOR). Office de l'Environnement de la Corse 30p
Sampling protocol is detailed in document available here : https://www.oec.corsica/Un-reseau-d-observateurs-scientifiques-embarques-a-bord-des-navires-de-la-petite-peche-cotiere-de-Corse_a4812.html

OEC 2021: Projets DACOR-Données Halieutiques Corse - Synthèse et Bilan, 30p

Durieux E.D.H., Bouet M., Bousquet C., Patrissi M., Lanfranchi J-B., Susini S., Cesari F., Massey J-L., Aiello A., Culioli J-M., Lejeune P., Dijoux J., Duchaud C., Santoni M-C. (2020) Rapport scientifique final - projet Données hAlieutiques CORses (DACOR) 2017 – 2019 - FEAMP mesure 28 partenariat scientifiques – pêcheurs. 170 pp + Annexes

Compliance to international recommendations:
Y

Sampling implementation

Recording of refusal rate:
Y. The Ifremer web application "WAO" is used to monitor the work of subcontractors, to record refusals and reasons for cancelling an observation (bad weather, change of activity of the trade, lack of space on board, security problems, ...).

Monitoring of sampling progress within the sampling year:
Regular monitoring of the sampling effort is carried out through the Corsican fisheries database (OEC Data Base), and also by the monitoring of the vessels through the WAO software. A regular review with

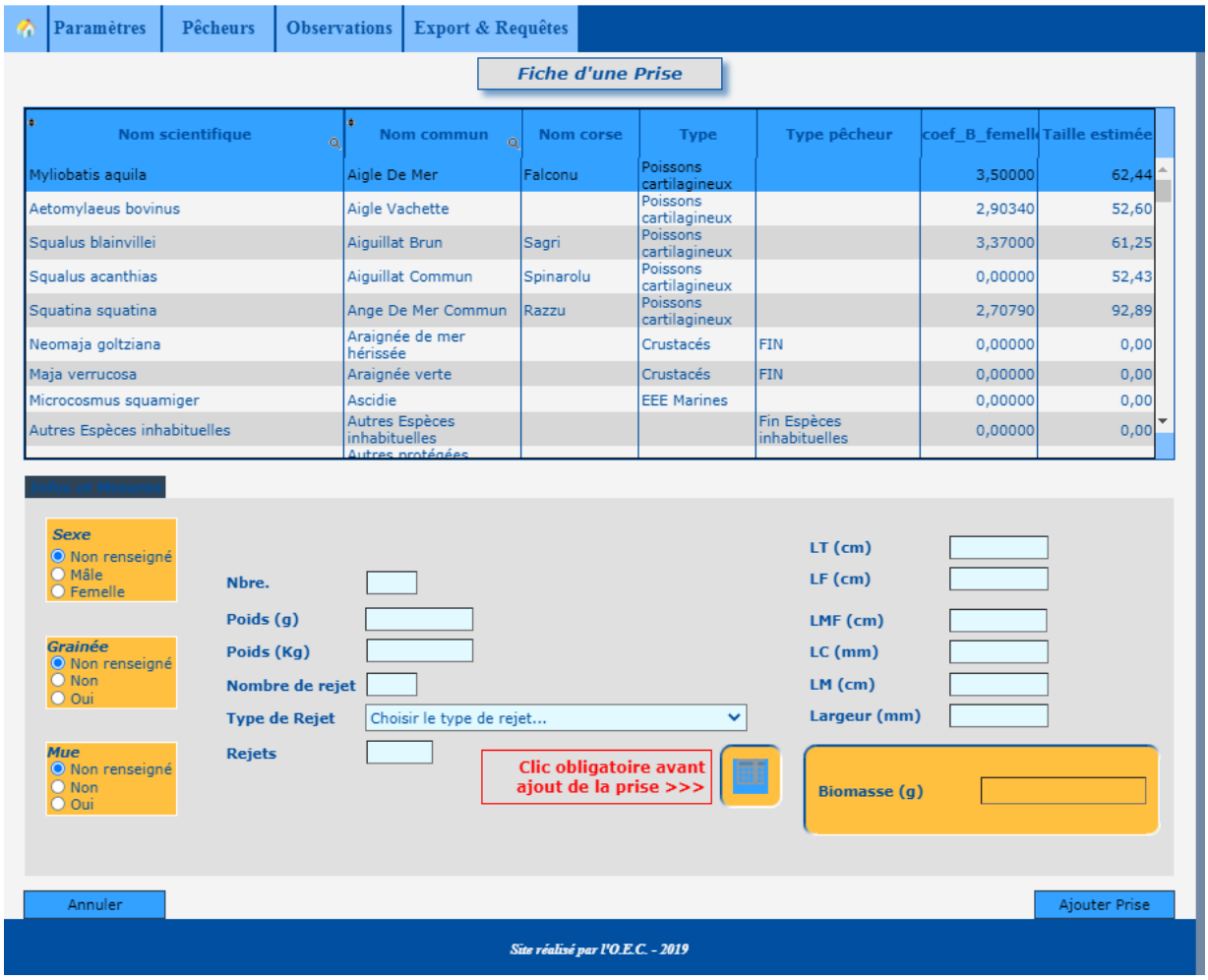
the GSA8 observers at sea is carried out each month and a balancing of the sampling effort is requested from them if necessary.

Data capture

Means of data capture:

The catch data are collected according to the CF-DCF (DACOR) sampling protocol: Observations at sea (on board the fishing vessels) and one shore sampling provide the size structure of the catches (retained and discarded) of all captures and the main species exploited by the Corsican fleets. The total lengths of the individuals are measured to the nearest centimeter using ichthyometers or calliper (mm for crustaceans), and the weights are recorded using scales (when boarding conditions permit). The weight is verified on the basis of the size-weight relationships included in the Corsica fisheries database. The discards are also categorized according to the cause of the discard (predation by sea flea, predation by *Tursiops truncatus*, undersized individuals...) and whether they are released alive or discarded dead. The weight of discards and accidental caches are collected at sea or estimated.

All the parameters associated with each fishing operation are considered (gear, net size, fishing time, etc.) and each operation is geolocated using a GPS. By-catches including PETS are sampled. All the data collected in the field on submersible plates are then entered into the Corsica fisheries database using specific forms adapted to the sampling protocol.



Instructions for data entry in the Corsica fisheries database have been produced for the observers. (available on request)

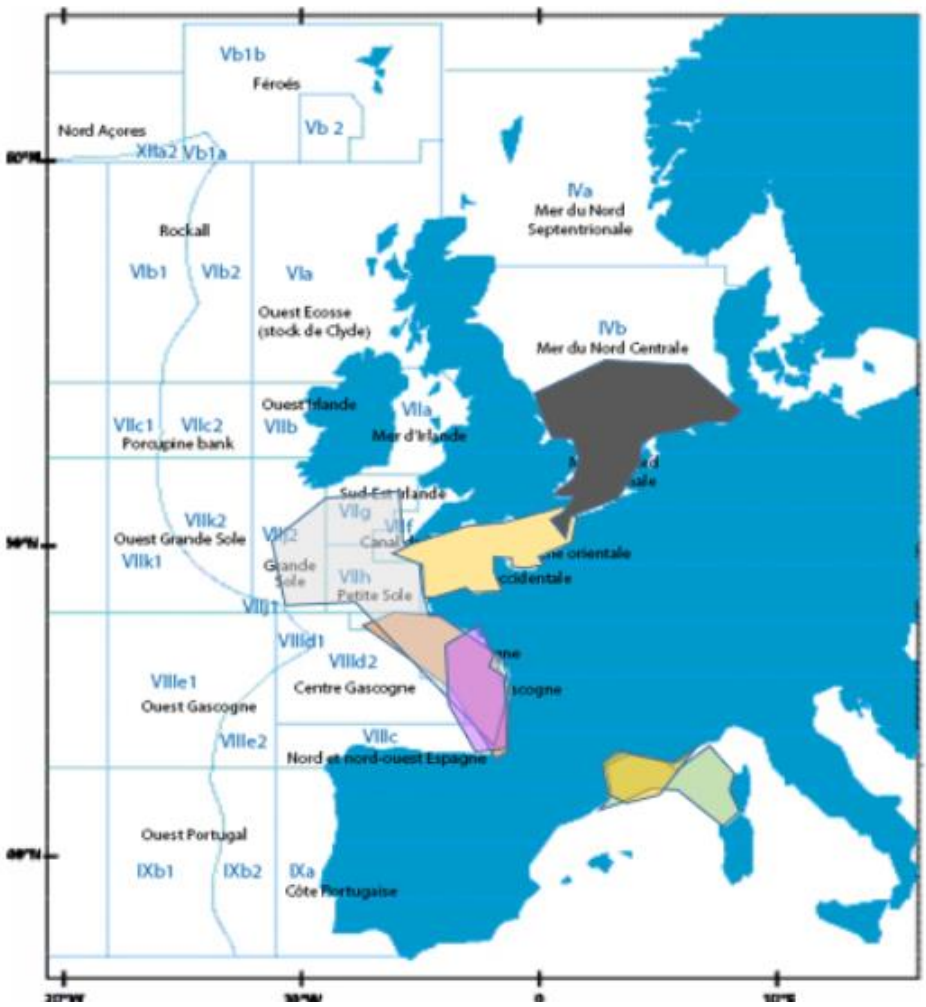
Data capture documentation:

Documentation available on request from Corsican Environment Office
Santoni M-C., Lanfranchi J-B., Susini S. (2021), Protocole d'échantillonnage Observateur en mer, Projet CF-DCF (DACOR). Office de l'Environnement de la Corse 30p
Link: https://www.oec.corsica/Un-reseau-d-observateurs-scientifiques-embarques-a-bord-des-navires-de-la-petite-peche-cotiere-de-Corse_a4812.html

Quality checks documentation:
N
Data are exported regularly from the Corsican fisheries database and manually verified by the CF-DCF at-sea observer network coordinator for Corsica. A systematic verification system is in development.

Biological parameters specific – ObsBio

MS .....: FRA
Region.....: North Sea and Eastern Arctic, North-East Atlantic, Mediterranean and Black Sea
Sampling scheme identifier ....: Obsbio
Sampling scheme type.....: Biological parameters specific
Observation type .....: SciObsOnShore
Time period of validity.....: from January 2022 onward
Short description: *Obsbio* is the name of the program for the collection of biological variables (weight, sex, maturity staging and age) on shore and during scientific survey in France covering all continental regions. The objective is to collect, together with length measurement, at least one biological variable among weight, sex, maturity staging and age estimation from calcified structures (scales, otoliths…). The sources of biological variables data collection are from purchase of fish at some major landing sites and from scientific surveys (IBTS Q1, IBTS Q4-EVHOE, MEDITS…) for the species selected in Table 2.1. The sampling programme to be implemented as from 2022 onward has been totally redesigned to better qualify and track the life cycle of the data. These biological parameters sampling scheme is fully processed by Ifremer institute in line with EU-MAP provisions coordinated by the French Directorate for Fisheries (DPMA). The Biological parameters programme is described in a SIH web site available to all stakeholders.
Description **of** the population
Population targeted: The populations targeted comprises the principal commercial species subject to fishing quotas and selected for sampling in table 2.1 in mainland France. **Population sampled:** The population sampled is a selected list of species subject to a call for data for stock assessment working groups. **Stratification:** Biological parameters is stratified in 3 geographical regions (Mediterranean Sea, North Atlantic, North Sea and Eastern Arctic), where scientific surveys are carried out (as shown in the four figures below), which are completed, depending on fishing sector and species, by purchase of fish.



Map of the main surveys carried out by Ifremer institute each year.

SAMPLING DESIGN AND PROTOCOLS

Sampling design description: France is operating a large-scale biological parameters sampling scheme, which forms the primary source of data for stock assessment working groups. The new working method recently put in place allows a better visibility of the national workflows, ranging from sampling frames with desirable collection objectives to data banking (~30 000 fish per year, 40 species).

The two sources for the collection of biological parameters are the research survey at sea and fisheries dependent data collection on shore. The collection of biological parameters during the surveys follows strictly the relevant protocol agreed internationally and available in the documented survey protocols (ICES SISP or TIMES, web pages listed below). On shore, two protocols are used: if it is possible to collect otoliths or scales without damaging the fish under auction this solution is prioritized, otherwise the fish is purchased through a first buyer in an auction precising the desired geographical area of origin of the fish. On shore it is also recommended to proceed to small samples repeated several times during the quarter.

The sampling plan for biological parameters was developed as follows:

Sampling allocation: The established sampling allows for the achievement of desirable objectives of scientific surveys protocols (all samples or a number of fish by length classes and geographical strata)

depending on the species. The completion of the sampling objectives is always dependent on the abundance in the catches.

For fish purchase or direct biological parameter collection on a sampling site, the sampling frames are stock specific and the allocation per quarter are stable every year and defined generally after an agreement with the main end-user, i.e. assessment working group and/or benchmark. .

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

Regional coordination: No regional coordination.

Link to sampling design documentation:
https://sih.ifremer.fr/Ressources/Parametres-biologiques

Selection of species to sample: The species selected for the collection of biological variables are species for which a stock assessment is needed mainly for sustainable management of exploited fish stocks.

Selection of geographic distribution to sample: Each selected species is part of one or more recognized stocks for population monitoring. Many stocks are assessed in international working groups. The sampling objectives are given for species in their geographical areas. Depending on the monitored species, there is monthly allocation or during their reproduction period for maturity.

Selection of number and variables of samples: Each stock has been monitored for many years with a sufficient number of individuals to allow the proper assessment of the resource. There may be adjustments to the objectives following requests from the ICES working group WGBIOP. For this qualitative data, a minimum of one pair of parameters, most often size and age estimate, is desired by the working groups.

Link to sampling protocol documentation:

- IBTS (IBTS_Q1): https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP1-IBTSVIII.pdf
- PELMED (MEDIAS): http://www.medias-project.eu/medias/website/
- PELGAS (SAHMAS) : https://www.ices.dk/sites/pub/Publication%20Reports/Techniques%20in%20Marine%20Environmental%20Sciences%20(TIMES)/TIMES64.pdf
- MEDITS : https://www.sibm.it/SITO%20MEDITS/principaleprogramme.htm
- CGFS, EVHOE (IBTS_Q4): https://www.ices.dk/sites/pub/Publication%20Reports/ICES%20Survey%20Protocols%20(SISP)/SISP%2015%20NeAtl%20IBTS%20Survey.pdf
- ORHAGO (ORHAGO_Q4_FRA [WGBEAM]) : https://doi.org/10.17895/ices.pub.8114
- FISH PURCHASE and bIOLOGICAL DATA COLLECTION UNDER AUCTION : https://archimer.ifremer.fr/doc/00116/22764/

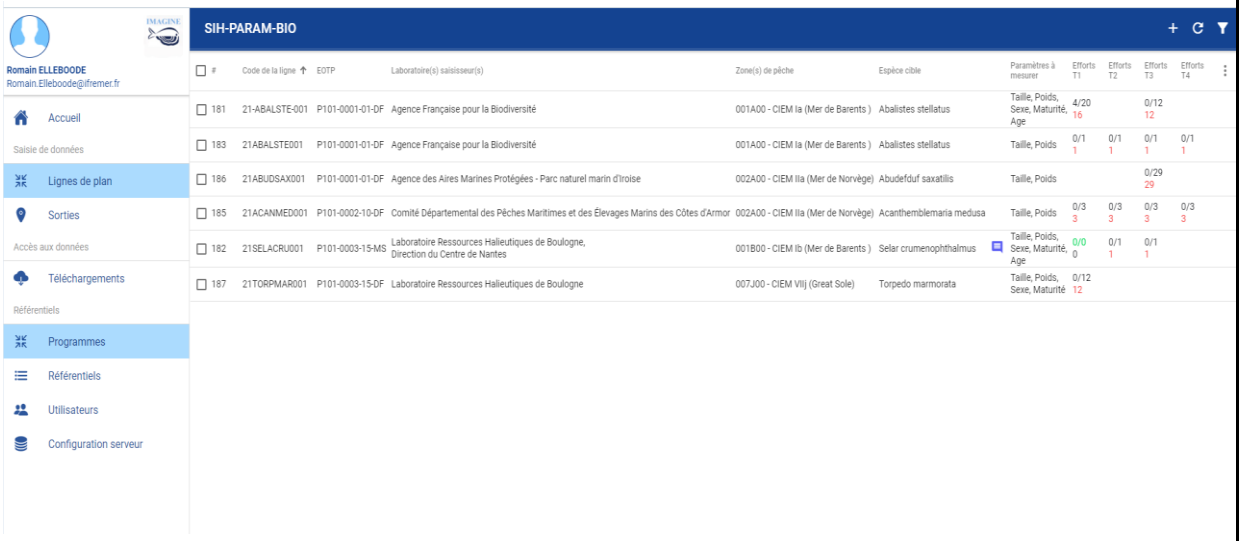
Compliance to international recommendations: The collection of biological variables is in line with international good practice and international standards as set up by Workshops on age (e.g. WKVALPEL https://doi.org/10.17895/ices.pub.5966) and end-users such as assessment working groups and to all relevant scientific survey sampling protocols https://w3z.ifremer.fr/ederu/International/GT-internationaux/Planning-participations https://www.ices.dk/community/Pages/PGCCDBS-doc-repository.aspx

SAMPLING IMPLEMENTATION

A web application type of Laboratory Information Management System (LIMS) is in development with modular features (by Ifremer/SIH [Open-source software based on https://github.com/sumaris-net/sumaris-d]). The name of the project is IMAGINE (Integration and MAnagement tool for bioloGical INdicEs).

Recording of refusal rate: No. This data collection is based on either scientific surveys or on shore from commercial fisheries.

Monitoring of sampling progress within the sampling year: The core function of LIMS has traditionally been the management of samples. A web application of the IMAGINE project will monitor the sampling in real time and help the observers in the field by knowing the sampling allocations. Here are the first views of this soon-to-be-available application.



The operational coordinator of this action regularly verifies the achievement of the desired objectives and holds meetings if necessary.

DATA CAPTURE

Means of data capture:

The data capture application used during the scientific survey is ALLEGRO (picture below, developed by Ifremer/SIH). This application is connected to the equipment on board during mandatory surveys at sea, for example the electronic ichthyometer, the fishing position of the vessel, etc.... allowing greater reliability of the data.

Regarding the on-shore sampling and the need to monitor the realisation of the planned targets, an application, newly developed under the IMAGINE project (images below) will be used as from January 2022. The application will be automatically synchronized with the data capture application in order to have a real time monitoring of sampling progress.

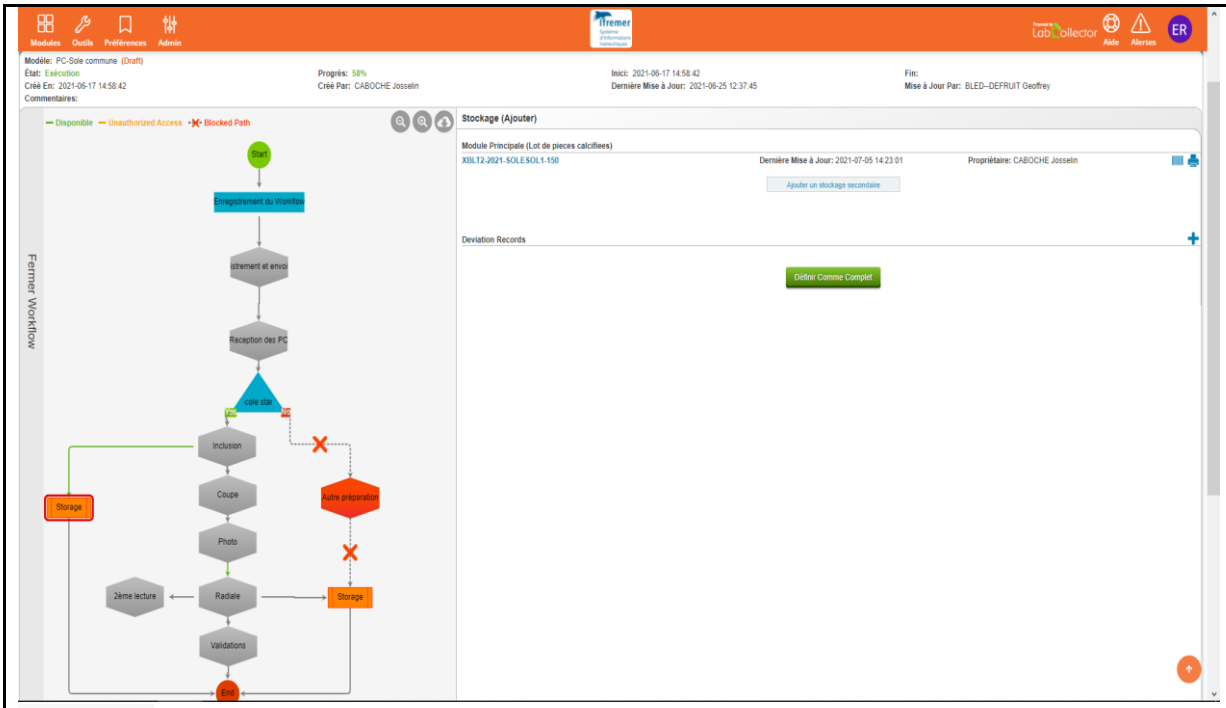
The collection of biological variables such as length, weight, sex, maturity are done directly with these tools (pictures above). This interface allows users to enter data directly when sampling in the field, although it is possible to enter data after (by copying) the fact for greater flexibility.

The sampling of calcified structures (scales, otoliths...) are sent to the national center of sclerochronology with a unique identifier.

Each shipment must be recording of a Workflow with GPS tag in the tool Labcollector Workflows module.

The website is under restricted access of the field observers and the national center of sclerochronology team.

https://labcollector6.ifremer.fr/labsih/



Each calcified piece is photographed with the ICY software (based on Micro-Manager) [Open-source software].

Age estimation by experts is made with the SMARTDOTS application integrated in the IMAGINE project [Open-source software, https://github.com/ices-eg/SmartDots]. This is the same as the tools developed during the exchanges and workshops (https://www.ices.dk/data/tools/Pages/smartdots.aspx).

Data capture documentation:
For survey: https://doi.org/10.13155/71340
For the purchase of fish to complete the desired targets: https://archimer.ifremer.fr/doc/00116/22764/

Quality checks documentation: For surveys, we check the quality of the data with https://tutticontroler.fr/ web application for a large number of parameters running in the scientific surveys.
For the purchase of fish to complete the desired targets : https://archimer.ifremer.fr/doc/00116/22764/

Usually we use ALK and Length Weight Key to check biological variables.
We will update the document when the IMAGINE project goes into production (2022).

DATA STORAGE

National database. The IMAGINE project will use the Ifremer/SIH database named HARMONIE from 2022 onward. There is no link to HARMONIE description but to its data catalogue.

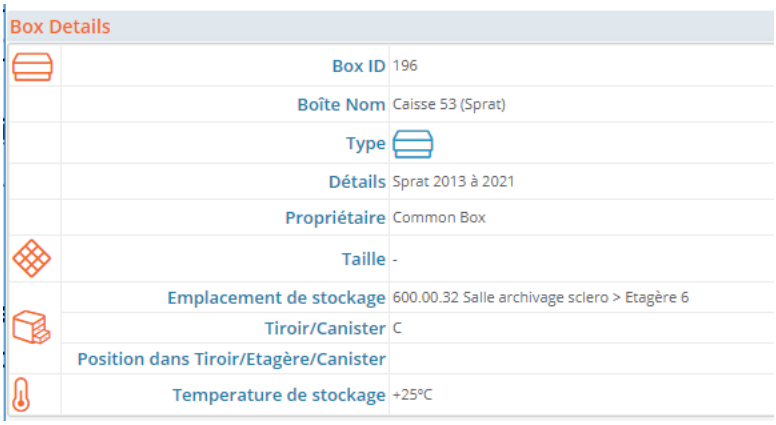
International database: The French Biological parameters data are uploaded on DATRAS, MEDITS, and the RCG RDB hosted by ICES and others.

Quality checks and data validation documentation:
The CREDO unit coordinates the responses to the calls for data for the French fisheries monitored by IFREMER. Depending on the needs, a network of fishery scientists and statisticians is mobilized in order to provide the best possible data and estimates within the time limit set by the applicant. The members of the CREDO unit participate actively in different working groups attached to the RFMOs (ICES, GFCM, ICCAT, NAFO, etc.), working on numerous topics related to the monitoring of fish stocks (data, stock assessment, campaigns, etc.).
https://wwz.ifremer.fr/manchemerdunord/Unite-Halieutique/Plateformes-et-outils/Cellule-CREDO#:~:text=La%20cellule%20CREDO%20coordonne%20les,françaises%20suivies%20par%20l%27IFREMER.&text=Les%20membres%20de%20la%20cellule,CGPM%2C%20CICTA%2C%20NAFO…)

We will update the document when the IMAGINE project goes into production (2022).

Sample storage

Each calcified piece is physically stored in an archive room with unique digital tracking using the Labcollector application (as shown in the four figures below). Each sample is stored for a minimum of 3 years in a dedicated room on site. After this 3-year cycle, the samples are transferred to the Ifremer centre in Brest for indefinite storage in much larger storage facilities.



DATA PROCESSING

Evaluation of data accuracy (bias and precision): Yes. A quality document is developed for each dataset prepared with the COST libraries. This document is available internally for experts willing to check the outputs before submission and is stored on a shared folder, together with the original datasets and the script used to generate the processed data. There is no literature on the issue, since the generic quality document is a lively document subject to permanent improvement. All elements regarding data accuracy demanded by the end-user are provided within the submitted data forms. Below some excerpts of such quality document for the sole VIIIab dataset provided to ICES/WGBIE in 2021.

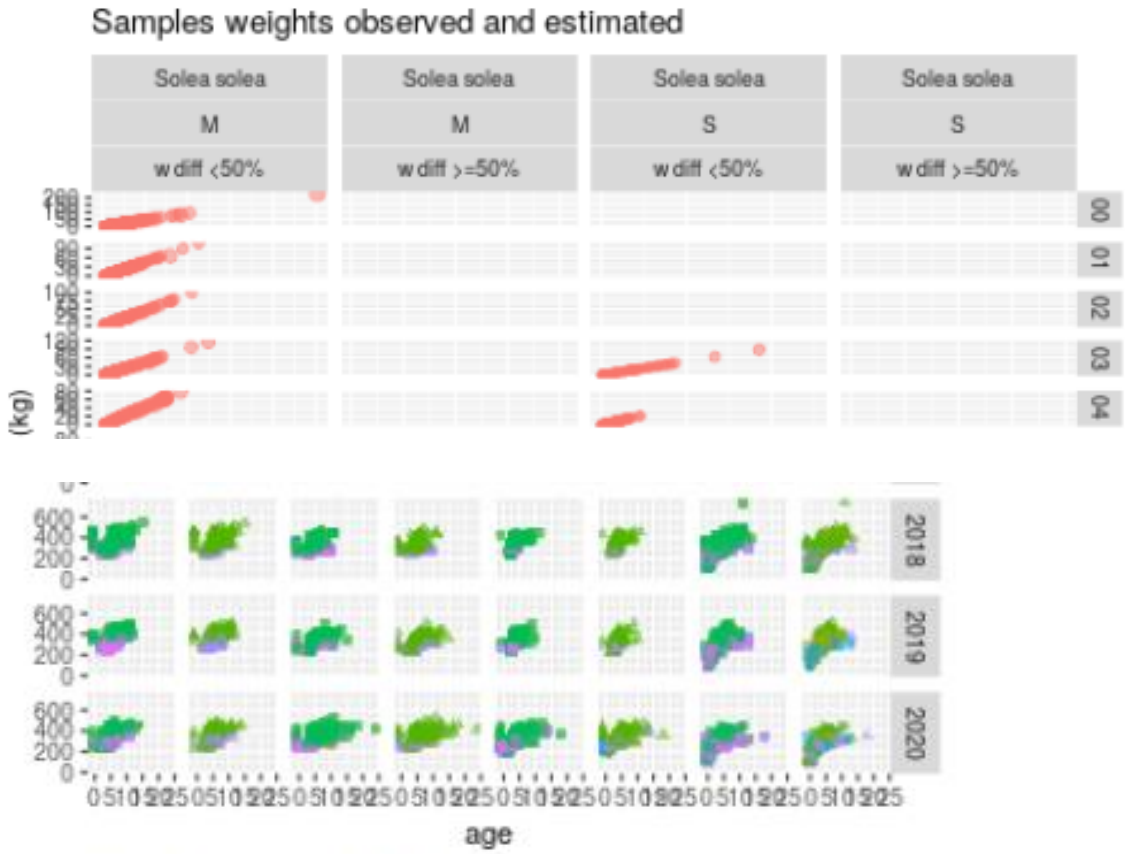


Figure 8: Length age raw data vs duplicated one

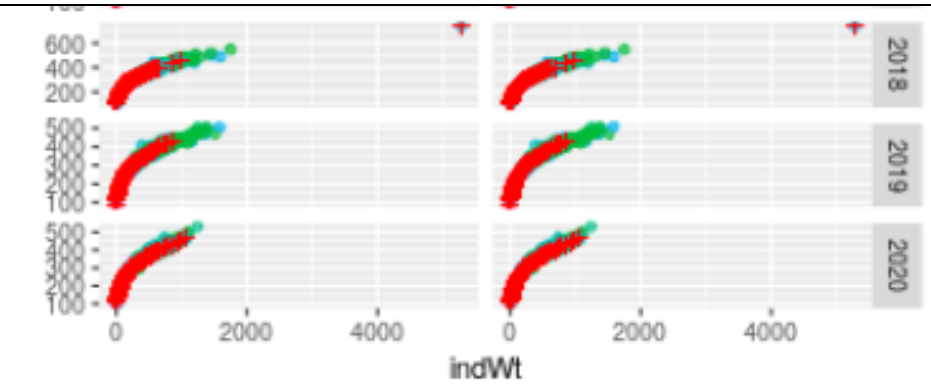


Figure 9: Length weight raw data

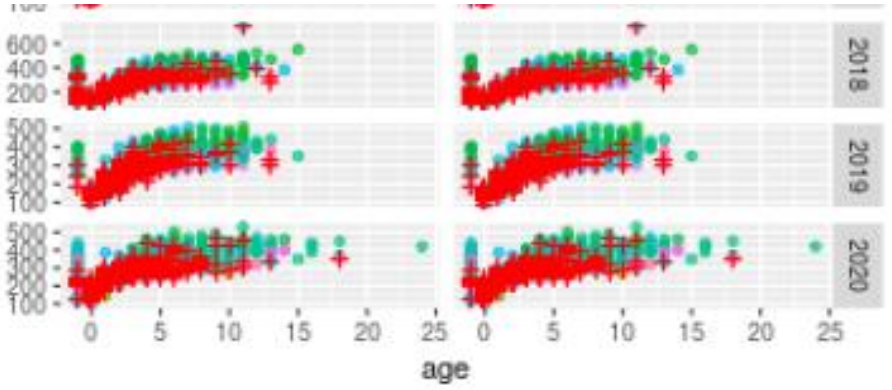


Figure 10: Length age raw data

Editing and imputation methods: Yes. In the same document as above. Metiers and areas are grouped by proximities and similarities to the main item as demanded by the end-user (see extract of the document below for metier grouping). The differing metiers and areas are left unchanged and provided without sampling if not enough samples or fish have been collected for the stratum.

Metier stratification

final	foCatEu6	wlan	nlan	ndis
GTR_DEF_100-119_0_0_all	GTN_DEF_>=100_0 GTR_CEP_>=100_0 GTR_DEF_>=100_0	2072.26 (47885.34)	285 (8134)	46 (1191)
OTB_DEF_>=70_0_0	OTB_CAT_>=70_0 OTB_CEP_>=70_0 OTB_DEF_>=70_0 PTB_DEF_>=70_0	390.26 (10579.51)	66 (2688)	3 (299)
OTT_CRU_>=70_0_0	OTT_CRU_>=70_0	124.65 (4291.91)	85 (1914)	7 (99)
GNS_DEF_100-119_0_0_all	GND_CAT_>=100_0 GND_DEF_>=100_0 GND_LPF_>=100_0 GND_SPF_>=100_0 GNS_CAT_>=100_0 GNS_DEF_>=100_0 GNS_LPF_>=100_0 GNS_SPF_>=100_0	97.16 (2944.16)	56 (551)	1 (40)
OTT_DEF_>=70_0_0	OTT_CEP_>=70_0 OTT_DEF_>=70_0 OTT_MOL_>=70_0	89.81 (3745.59)	34 (1782)	0 (115)

Quality document associated to a dataset: Yes. Same as above.

Validation of the final dataset: France sends hundreds of datasets to various end-users on a yearly basis. Only the major stocks and major data calls have a process of validation before sending. This topic is a case for concern and methods are constantly improved, workforce and tools are currently being reinforced to improve the current situation.

Commercial fishing trip - Obsventes

MS .....: FRA
Region.....: North Sea and Eastern Arctic, North-East Atlantic, Mediterranean and Black Sea
Sampling scheme identifier ....: ObsVentes
Sampling scheme type.....: Commercial fishing trip
Observation type .....: SciObsOnShore
Time period of validity.....: from July 2020 onward

Short description: ObsVentes is the name of the sampling programme on-shore in France covering all regions mainland (Corsica excluded) and in outermost regions, although this document will specifically detail the mainland sampling scheme (see Annex 1.1 Obsventes in Outermost region for specific description). ObsVentes is the acronym of 'Observation des ventes' i.e. observation of fish sold in an auction and at landing sites. The objective of the sampling scheme is to collect length samples from commercial fisheries on-shore for the principal species landed.

The sampling programme has been totally redesigned from July 2020 onward to better align with the 4S principles and for a better integration with the at-sea ObsMer programme. Both ObsVentes and ObsMer are coordinated by Ifremer under the supervision of the French Directorate for Fisheries (DPMA) and are operated on the field by subcontractors. Mainland, the programme covers all auctions and some major landing sites in the Mediterranean (excl. Corsica).

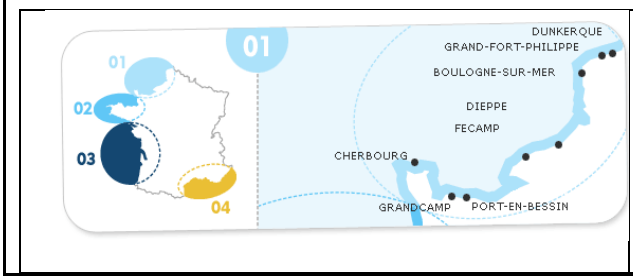
The ObsVentes programme is described in a flyer available to all stakeholders and a short description in a dedicated webpage.

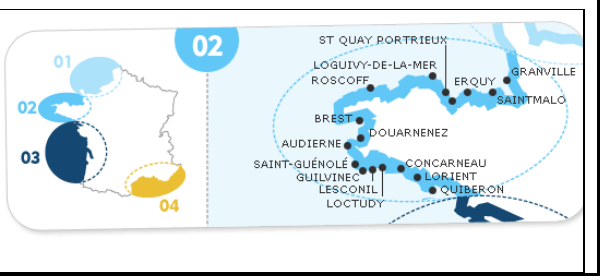
DESCRIPTION OF THE POPULATION

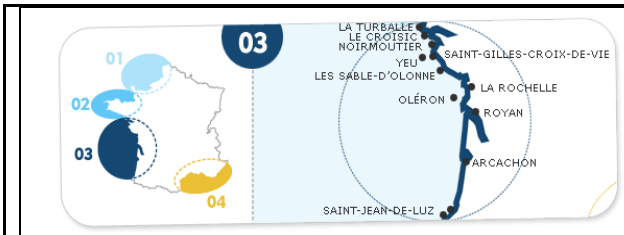
Population targeted: The population targeted is the landed fish in mainland France (excl. Corsica) of commercial fisheries catching species listed in table 2.1.

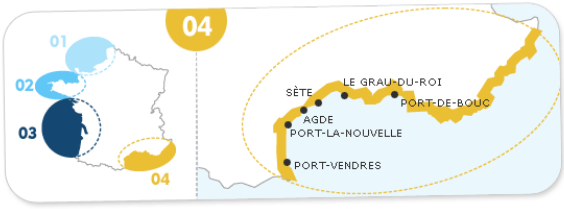
Population sampled: The population sampled is a selected list of species landed in all French auctions and major landing sites in the Mediterranean (Gulf of Lion). As out of frame the sampling scheme excludes non-auctioned landing sites, except a few major ones in the Mediterranean and does not include Corsica, where fisheries are monitored only at-sea.

Stratification: ObsVentes mainland is stratified in 4 geographical lots and then by auction/landing site and quarters as shown in the four figures below.









SAMPLING DESIGN AND PROTOCOLS

Sampling design description: Auction sales have the benefits of being easily accessible, less expensive to sample than the at-sea programme and having all fish graded by commercial categories (proxy for length structures). On the other hand, sampling the landing fraction is a restricted part of the catches and under auction it is difficult to sample all species. The new sampling design for ObsVentes capitalizes on the benefits listed above and completes the more than 500,000 fish measured on-board on average every year. The ObsVentes sampling design has been elaborated as follows:

Sampling allocation: The primary sampling units (PSU) are the auctions and major landing sites. The total envelope of visits to auction in a year (N ~ 800) is spread across all PSUs (landing sites * quarters) based on the volume of landings in each landing site. As a result, a number of visits (n_{sq}) is attributed to each landing site (s) and quarter (q). A threshold of 26 is applied for a maximum number of visits (n_{sq}) per quarter which corresponds to entering in an auction for measuring fish twice a week. The secondary sampling unit (SSU) is a species to sample from a fishing trip during a visit.

Selection of PSUs to sample: The n_{sq} visits in a landing site/quarter are left at the discretion of the operators on the field when to sample, in order to provide latitude for managing a sampling team involved in monitoring multiple landing sites in a lot and for some involved also in at-sea sampling; The protocol requires to spread the n_{sq} evenly during a quarter in the likes of a systematic sampling.

Selection of SSUs to sample: The randomness of the sampling comes with the selection of species to sample when entering a landing site. At a maximum of 3 days before visiting the landing site, the observer triggers in the WAO application the list of species to sample from a random draw with replacement. This operation is based on a reference table of species inclusion probabilities by landing site and quarter, where the probability value of each species can be modified in real time by Ifremer to account for the needs (too few or enough samples from at-sea sampling, opening/closure of a fishery, specific needs, …); When all sampling operates in full capacity, these inclusion probabilities are fixed so that there's only marginal modification of these.

When entering a landing site the observer has a list of *m* ordered species*trip to sample. *m* is usually twice the number of species*trip that is possible to sample during the available time. This is to take account that some of the selected species will not be available that day. Species*trip means that the observer must sample all categories of that species in a chosen trip. If the species*trip is listed several times in the random draw with replacement, this means the observer must sample as many vessels for that species.

Landed PETS, i.e. some sharks and rays identified by region have a special feature in ObsVentes sampling design since they are out of the random draw and must be sampled at every opportunity when visiting a landing site.

Is the sampling design compliant with the 4S principle?: Yes, the moment to visit an auction is not randomly selected for several reasons (larger auctions may be visited once or twice a week on a systematic basis, team management due to the share of the same technicians for at-sea and on-shore sampling, avoidance of visits to auctions with no or little material to sample, …) but a random draw with replacement on the list of species*trip to sample is formally put in place when going to a landing site. The sampling frame contains a weighting variable to allow a better control of the species measured depending on the needs, the season and the number of samples obtained from at-sea sampling.

Regional coordination: No regional coordination, but the sampling design has been developed following the principles suggested by the series of ICES/WKPICS workshops.

Link to sampling design documentation:

- Fish identification keys : pdf
- Measuring guide : pdf
- Quality document : Annex 1.1

Compliance to international recommendations: Yes. The sampling design is a variant of the option D of the 4S designs detailed in WKPICS3 (ICES, 2014) page 42. The collection of length measurements is in line with international good practice (high number of samples, low number of individuals measured per sample (<50)) and international standards as set up by end-users such as ICCAT, ICES and GFCM.

ICES. 2014. Report of the third Workshop on Practical Implementation of Statistical Sound Catch Sampling Programmes, 19-22 November 2013, ICES HQ, Copenhagen, Denmark. ICES CM2013/ACOM:54. 109 p

Link to sampling protocol documentation: The sampling protocol is a document on restricted access for observers on the field. Since the whole programme is subcontracted, the sampling protocol was part of the prerequisites for the public call for service and is planned to be publicly available soon.

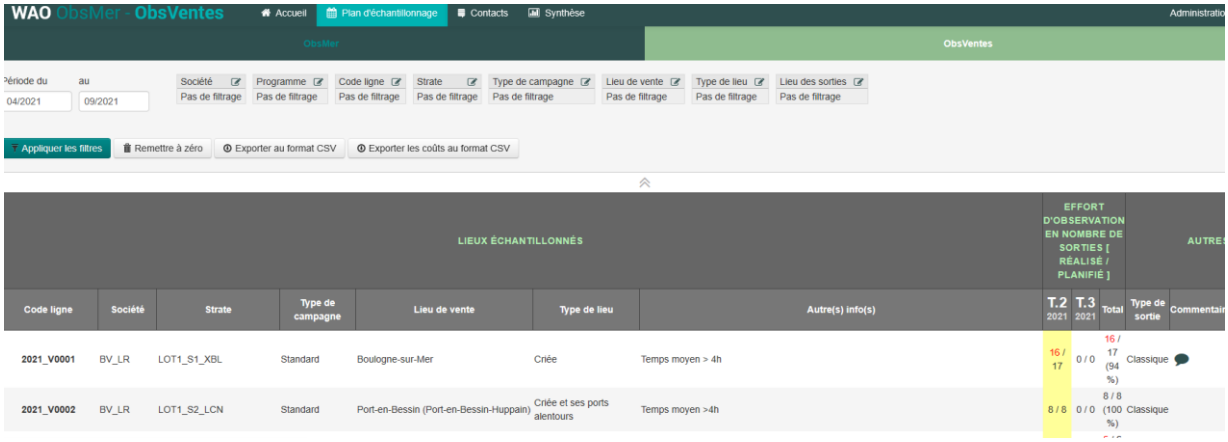
SAMPLING IMPLEMENTATION

Recording of refusal rate: No. Access to auction and to fish landed is generally accessible, and when refusals occur they are generally quickly resolved. There is an exception with an auction on the Atlantic coast which remains un-accessible since about 3 years, but continuous effort is made to eventually resolve this.

Monitoring of sampling progress within the sampling year: A Web Application for Observers (WAO[5]) has been developed for monitoring the sampling in real time and helping the observers on the field knowing the sampling allocations and generating the random draw for species to sample. In the picture below two sampling frames are displayed (Boulogne/Mer V0001 and Port-en-Bessin V0002

[5] WAO : web application for making the sampling plan available for observers, monitoring the progress of the realisation rate by daily recording of field observations.

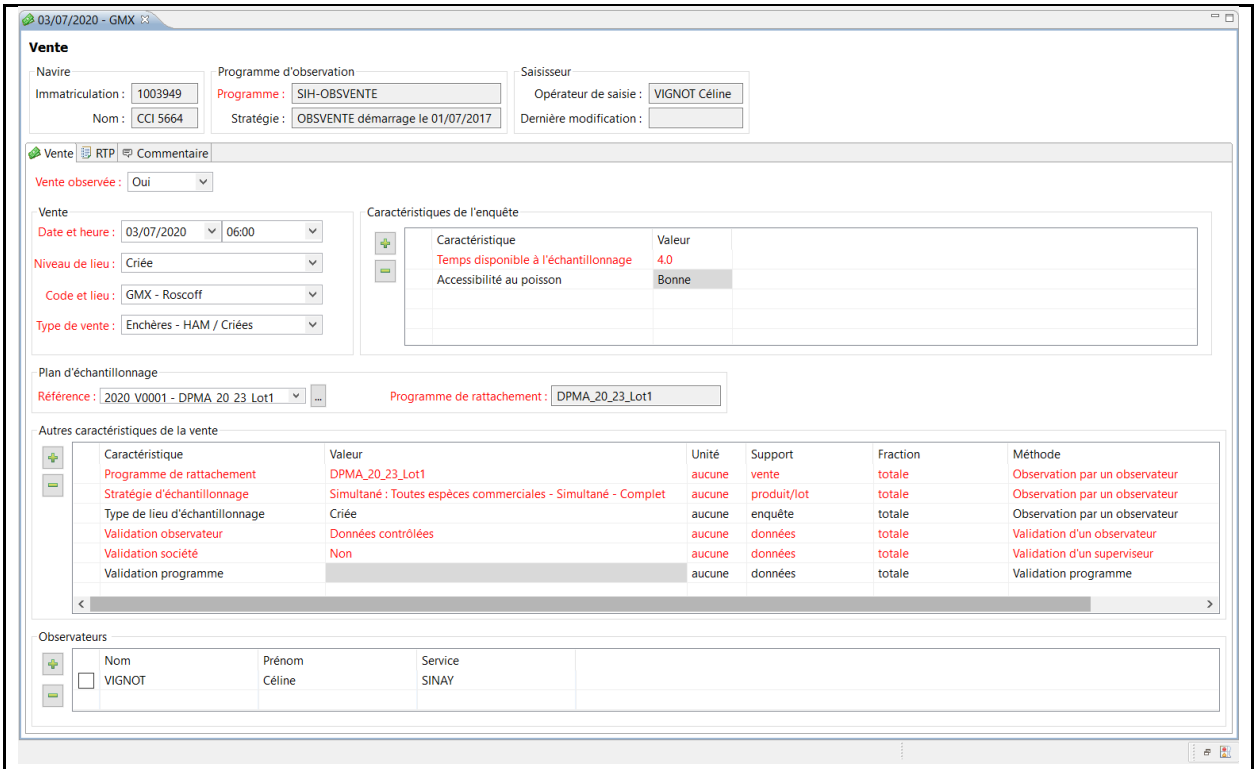
auctions) and the realisation of quarter 2 (T2) are almost completed, 16/17 for V0001 and 8/8 for V0002



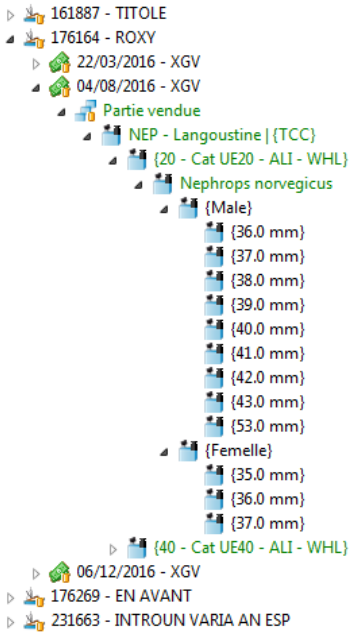
A meeting of a steering group comprising the French Directorate for Fisheries (DPMA), Ifremer, sampling companies and industry representatives is held on a quarterly basis. The mandate of the steering group is to discuss the past quarterly realisation, address the main issues encountered and prepare for the next quarterly plan. All decisions taken are documented in a steering group quarterly report.

DATA CAPTURE

Means of data capture: The data capture application developed by Ifremer/SIH for all the observers is named ALLEGRO (pictures below). Until now, there is no use of electronic measuring board, only caliper, measuring ruler and paper filling on the ground (see measuring guide with pictures on the first page and text in the document). The observer makes use of ALLEGRO when back at the lab to capture the data in the Harmonie database. It is to be noted that the scan of the papers filled during the visit to auction is included in the WAO application on the line referring to the relevant realisation.



Once noted the vessel sampled, the capture of length measurement is done using a specific screen (below)



Data capture documentation: [website]

Quality checks documentation: Not yet. Quality checks are developed at every stage of the data life cycle. At first, the data capture tool (ALLEGRO) includes basic QC, then the data storage (HARMONIE) when synchronizing with ALLEGRO. those potential errors are then dealt between Ifremer and the ObsVentes subcontractors before being formally validated by Ifremer ObsVentes team.

In order to help in this validation stage, a R script has been developed, is currently being improved and will be available through a web application in 2022. The documentation will then be prepared ahead of the implementation.

DATA STORAGE

National database: The Ifremer/SIH database is named HARMONIE. There is no link directly to HARMONIE but to its data catalogue.

International database: The French ObsVentes primary data are now uploaded the RCG RDB hosted by ICES.

Quality checks and data validation documentation: See QC documentation for data capture. Eventually, some errors may be detected when processing data for end-user purposes. Ifremer extensively uses the COST libraries and the QC as detailed in the fishPi project (EU MARE/2014/19, Annex 18 and 19)

- COST packages and quality checks library : github
- fishPi final document : pdf

SAMPLE STORAGE

Storage description: In ObsVentes programme there is no sample storage of any sort.

Sample analysis: All fish are measured on site and put back to their original box for sale.

DATA PROCESSING

Evaluation of data accuracy (bias and precision): Yes. A quality document is developed for each dataset prepared with the COST libraries. This document is available internally for experts willing to check the outputs before submission and is stored on a shared folder, together with the original datasets and the script used to generate the processed data. There is no literature on the issue, since the generic quality document is a lively document subject to permanent improvement. All elements regarding data accuracy demanded by the end-user are provided within the submitted data forms. Below the first 4 pages of such quality document for the cod VIIe-k dataset provided to ICES/WGCSE 1n 2021.

Data compilation cod.27.7e-k

ptyx 0.95

Wed Apr 14 17:45:25 2021

Framework

Generalities

This document report the results of the ICES data compilation for the stock . From the raw data, the data exploration leads to the elimination of spurious information inside the sampling data. SACROIS, OBSMER and OBSVENTE metier are roughly associated with the ICES authorized metier using using gear, species assemblage and mesh size. Then metier for wich landings less than 10% of the total are categorized in MIS, and discards and length/age distribution if available are removed from the final estimates. A stratum is a statistical unit in which estimates are computed. In general terms it is about a quarter, an ICES division and a metier. By stratum, discards are estimated using ratio estimators on landings for the stock species. For the remaining metier, estimates (discards and length/age distribution) are provided by stratum if and only if :

- (1) for the discards: the number of samples is greater than 2 (3 samples for discards) inside the stratum.
- (2) for the length/age distribution: the number of fish measured is greater than 20 for length and age distribution inside the stratum and the number of samples is in line with the condition (1).
- (3) for the length/age distribution: if the sum of product of the fish weight by the number of fish caught divided by the total quantity of the discards or landings is between 0.8 and 1.2 inside the stratum.

If one of these condistions is not meet, then the estimates are not provided.

The raw data are located in the `data` directory and the intercatch file in the `ices` directory.

Details

Random notes :

- in 2019 BMS and registered discards are now provided ! Joy ! Data were provided by the wonderful SIH, the international mother of the fishery data in Ifremer. In the Intercatch file, new SI lines with catch category B for BMS and R for registered discards are added. For these lines, CATON is set to 0 and BMS and registered discards values are reported in the OffLandings column, as recommended by the gentle 2019 ICES data call.
- age length key is completed using a black box approach (multinomial modelling without any check regargind the model convergence) for landings, and simulating young fish using a von Bertalanffy growth model for discards. This step is experimental, probably buggy, unsatisfactory but validated by ICES. For more details look into the code.

1

- in the biological parameters files (slot `ca` of the sampling object), the information on the position of the individuals fish is not very homogeneous. Consequently some ad-hoc corrections were introduced to attribute an ICES division to a fish. For positions that are too vague, (aka 8AB for the location of a fish), the individuals were removed from the data (about 13% of the 677381 processed fishes and 10% for the year 2019 - estimations done the 06/04/2020). For a data-saving solution, go back to the original biological parameters files.
- the data are sop correction free.

Disclaimer

The estimates computed here are provided to ICES by default. These estimates are formatted in Intercatch files (format definition here[1]). The intercatch files available in the `ices` directory are submitted to Intercatch[2] more or less the day of the WG deadline (usually...) (see the datacall webpage[3] for the deadline). If the estimates do not suit your needs, please compute your own estimates and the related Intercatch files before the deadline. Intercatch files that do not strickly follow the ICES specifications cannot be uploaded on the Intercatch upload facility.

The aim of this report is to document the analytical steps used to compute the ICES estimates and to support data related discussion with stock assessor. To understand these steps, the code is provided.

[1] https://www.ices.dk/marine-data/Documents/Intercatch/IC-ExchangeFormat1-0.pdf
[2] https://intercatch.ices.dk/
[3] https://www.ices.dk/marine-data/tools/Pages/Data-calls.aspx

2

Stock identity

wg	WGCSE
stock	cod.27.7e-k
commonname	Atlantic cod/Morue de l'Atlantique
species	Gadus morhua
taxon	COD
area	7.e,7.f.7.g,7.h,7.j.7.k
year	00,01,02,03,04,05,06,07,08,09,10,11,12,13,14,15,16,17,18,19,20
precatch	0
catch_t_2020	371.2411
catch_t_2019	369.5188
catch_t_2018	495.5087
sacrois	3.3.8

Table 1: General stock information.

seuilfish	20
seuilsample	2
seuilsampledis	3
seuilage	30
seuilweight	30
stepIncr	10
typestratif	Div
timestratif	Quarter
currentyear	2020
nbyear	20
groupspace	TRUE

Table 2: Data compilation parameters.

Type	Results	Tresholds	Nb_2020	Nb_2020to2000
LAN	TRUE	0	6537 rows in CL	275927 rows in CL
LAN samples	TRUE	2	88 LAN samples	25838 LAN samples
DIS samples	TRUE	3	1 DIS samples	8887 DIS samples
sizeLAN	TRUE	20	305 fishes in LAN	196360 fishes in LAN
sizeDIS	TRUE	20	7 fishes in DIS	11889 fishes in DIS
age	TRUE	30	822 ages in CA	14901 ages in CA
weight	TRUE	30	157 weight in CA	4676 weight in CA

Table 3: Data availability.

3

ICES historical data

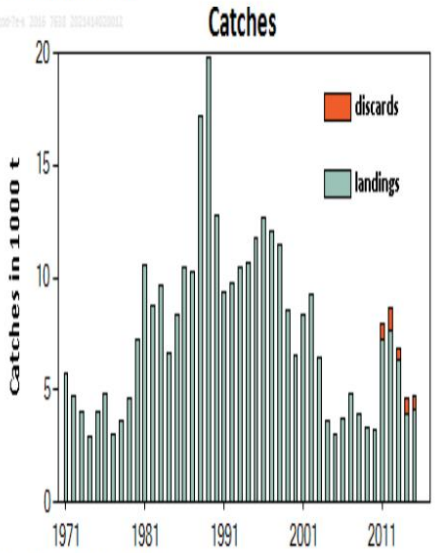


Table 4: Historical catches from ICES

Year	landings	discards	units
2000	6536	NA	tonnes
2001	8308	NA	tonnes

4

Editing and imputation methods: Yes. In the same document as above. Metiers and areas are grouped by proximities and similarities to the main item as demanded by the end-user (see extract of the document below for metier grouping). The differing metiers and areas are left unchanged and provided without sampling if not enough samples or fish have been collected for the stratum (threshold [seuil in French] are varying by stock and an example is shown in table 1 on the picture above). SOP

are estimated for all strata but no SOP correction is done, except for those not accepted by the end-user, e.g. must be in the range [0.8 – 1.2] for ICES. In these cases the SOP correction is done to 0.8 for those inferior to this value and to 1.2 for those superior. The method is thus transparent for the stock coordinator who will understand the quality of the data for all strata.

Metier stratification

final	foCatEu6	wlan	nlan	ndis
OTB_DEF_100-119_0_0	OTB_CEP_100_119_0 OTB_DEF_100_119_0 PTB_DEF_100_119_0	94.56 (29902.61)	4 (3137)	0 (355)
OTT_DEF_100-119_0_0	OTT_CEP_100_119_0 OTT_DEF_100_119_0	96.33 (9958.46)	6 (3103)	0 (198)
OTB_DEF_70-99_0_0	OTB_CEP_70_99_0 OTB_DEF_70_99_0 PTB_DEF_70_99_0	55.29 (8870.76)	38 (1195)	1 (89)
MIS_MIS_0_0_0	other	18.38 (2219.04)	2 (1883)	0 (258)
OTT_CRU_100-119_0_0	OTT_CRU_100_119_0	3.3 (4864.47)	31 (1377)	0 (151)
GTR_DEF_>=220_0_0_all	GTN_DEF_>=220_0 GTR_CEP_>=220_0 GTR_DEF_>=220_0	3.27 (380.74)	0 (416)	0 (187)
OTB_CRU_100-119_0_0_all	OTB_CRU_100_119_0 PTB_CRU_100_119_0	0.1 (2943.11)	0 (400)	0 (47)
OTB_CRU_70-99_0_0_all	OTB_CRU_70_99_0 PTB_CRU_70_99_0	0.01 (442.3)	0 (194)	0 (59)
OTM_DEF_100-119_0_0_all	OTM_DEF_100_119_0 OTM_LPF_100_119_0 PTM_DEF_100_119_0 PTM_LPF_100_119_0	0.01 (221.34)	0 (2)	0 (1)

Quality document associated to a dataset: Yes. Same as above.

Validation of the final dataset: France sends hundreds of datasets to various end-user on a yearly basis. Only the major stocks and major data calls have a process of validation before sending. This topic is a case for concern and methods are constantly improved, workforce and tools are currently being reinforced to improve the current situation.

Commercial fishing trip – Obsventes Outermost regions

MS .....: FRA
Region.....: Outermost regions
Sampling scheme identifier ....: ObsVentes Outermost regions
Sampling scheme type.....: Commercial fishing trip
Observation type .....: SciObsOnShore
Time period of validity.....: from July 2021 onward

Short description: ObsVentes Outermost regions is the name of the sampling programme on-shore in France covering specifically the sampling scheme designed for Guyane, Martinique, Guadeloupe, La Réunion and Mayotte. ObsVentes is the acronym of 'Observation des ventes' i.e. observation of fish sold in an auction and at landing sites. The objective of the sampling scheme is to collect length samples from commercial fisheries on-shore for the principal species landed.

The sampling programme in outermost regions is operated since several years, but is constantly adapting to specific context on the ground, so this version is valid from July 2021 when ObsVentes protocol was reviewed and in certain locations more closely linked to catch assessment survey (Obsdeb). ObsVentes is coordinated by Ifremer and is operated on the field either by Ifremer observers (Guyane, Martinique, la Réunion) or by subcontractors (Guadeloupe). In Mayotte ObsVentes is coordinated and operated by the Parc Naturel Marin de Mayotte (PNMM) and the help of Ifremer for using existing ObsVentes tools for sampling, monitoring and data storage.

The ObsVentes programme is described in a flyer available to all stakeholders and a short description in a dedicated webpage.

DESCRIPTION OF THE POPULATION

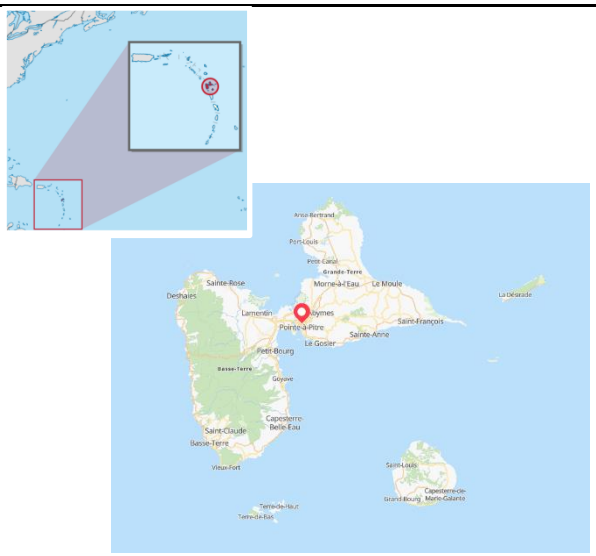
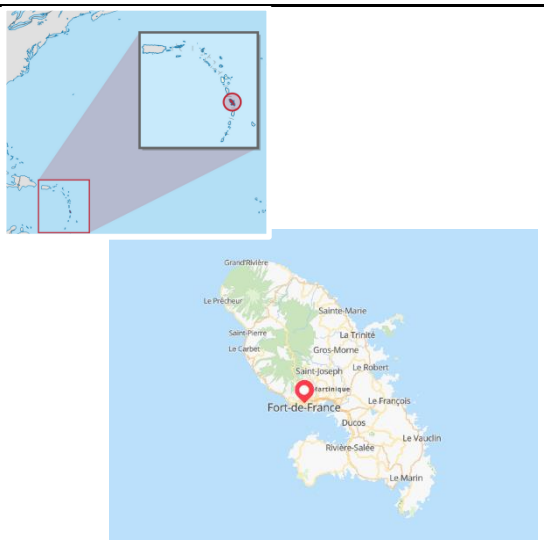
Population targeted: The population targeted is the landed fish of commercial fisheries catching species listed in table 2.1 in the listed locations.

Population sampled: The population sampled is a selected list of species landed in the main landing sites of the listed locations.

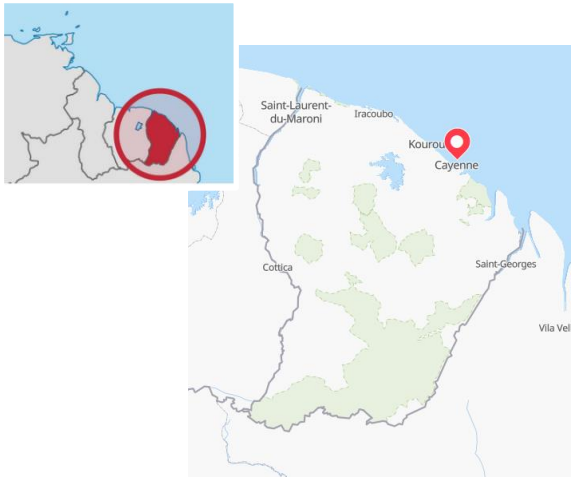
In Martinique, Guadeloupe and La Réunion, the sampling is done in parallel with the ObsDeb sampling scheme so all harbours are included in the sampling design and there is no out of frame. In Guyana and Mayotte the out of frame correspond to minor landing sites.

Stratification: ObsVentes in French Outermost regions is distinct in the 5 geographical locations as shown in the maps below and then stratified by landing site and quarters.

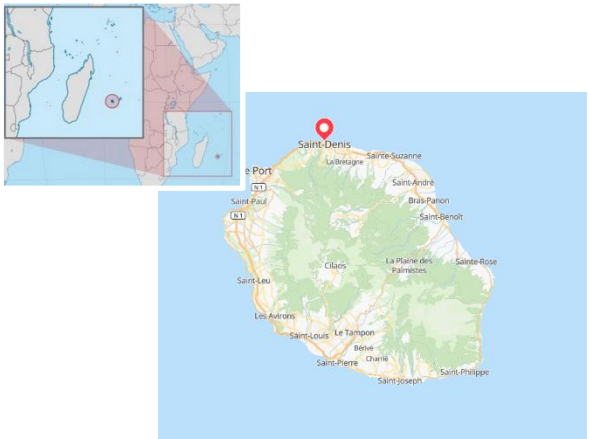
GUADELOUPE (Western Central Atlantic)	MARTINIQUE (Western Central Atlantic)

GUYANE (Western Central Atlantic)



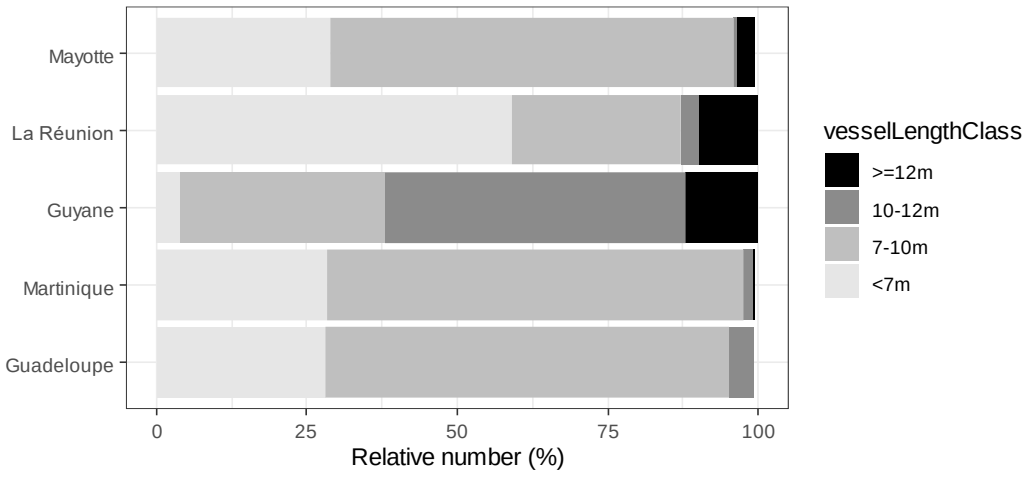
LA REUNION (Indian Ocean)



MAYOTTE (Indian Ocean)

SAMPLING DESIGN AND PROTOCOLS

Sampling design description: The specificity of the French outermost regions is the extremely scattered landing locations together with the small vessels composing the fleets and often direct sales from the vessel to clients at the arrival, making it extremely complex to take a representative sample.



Another specificity of the ObsVentes in outermost regions is the small quantity of fish landed by each fishing vessel and trip. There is thus a need to multiply the number of samples in order to get a representative length structure. To implement this, the catch assessment survey contributes also to "ObsVentes Outermost regions" sampling scheme in sampling opportunistically species in order to fulfil the planned targets. The ObsVentes sampling design has been elaborated as follows:

Sampling allocation: The primary sampling units (PSU) are the major landing sites. An envelope of visits is allocated per Outermost region based on the end-user needs. For each outermost region, the total envelope of visits to landing sites in a year is spread across all PSUs (landing sites * quarters) based on the volume of landings in each landing site. As a result, a number of visits (n_{sq}) is attributed to each landing site (s) and quarter (q). The secondary sampling unit (SSU) is a species to sample from a fishing trip during a visit.

Selection of PSUs to sample: The n_{sq} visits in a landing site/quarter are left at the discretion of the operators on the field when to sample, in order to provide latitude for managing a sampling team involved in monitoring multiple landing sites and for some involved also in the catch assessment survey (ObsDeb – see Annex 1.2). The protocol requires to spread the n_{sq} evenly during a quarter in the likes of a systematic sampling.

Selection of SSUs to sample:. When entering a landing site the observer has a list of species to sample. The observer must wait for the arrival of the fishing vessels, ask the master of the vessel the authorisation to sample and proceed with the measurements. When finished, the observer turns to another vessel on the arrival to sample. Due to the small quantities of fish landed, the observer must be present at the moment of arrival of the vessel, otherwise the fisher may sell the fish or bring it home in a matter of minutes. In Mayotte, to maximize the measurement number, all targeted fishes are systematically sampled when they are observed during the visit. Mayotte fisheries are not selective and

there is no discards at sea nor sorting during sales. Samples are supposed to be representative of the targeted population

Is the sampling design compliant with the 4S principle?: No, although the catch assessment survey (ObsDeb) is, so all fish measured within this sampling scheme are considered randomly selected.

Regional coordination: No regional coordination, but the sampling design has been developed following the principles suggested by the series of ICES/WKPICS workshops.

Link to sampling design documentation:

- Measuring guide : pdf
- Guide and protocol for sampling in Martinique: pdf
- Quality document : Annex 1.1

Compliance to international recommendations: Yes. The sampling design is a variant of the option D of the 4S designs detailed in WKPICS3 (ICES, 2014) page 42. The collection of length measurements is in line with international good practice (high number of samples, low number of individuals measured per sample (<50)) and international standards as set up by end-users such as ICCAT, IOTC and WECAFC.

ICES. 2014. Report of the third Workshop on Practical Implementation of Statistical Sound Catch Sampling Programmes, 19-22 November 2013, ICES HQ, Copenhagen, Denmark. ICES CM2013/ACOM:54. 109 p

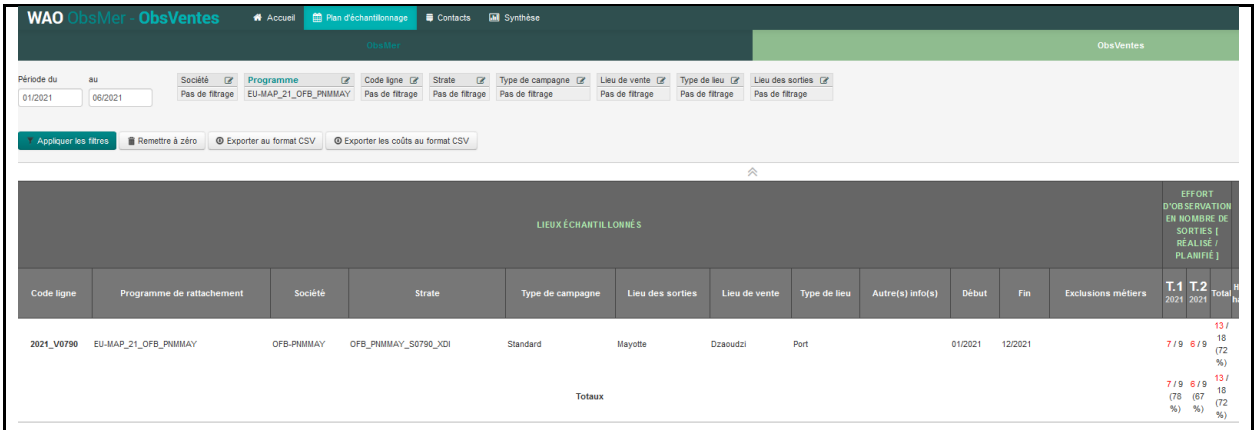
Link to sampling protocol documentation: The sampling protocol is a document on restricted access for observers on the field.

SAMPLING IMPLEMENTATION

Recording of refusal rate: No. Access to landing sites is free so all planned visits are realised but access to fish landed is conditioned to the vessel master's authorisation, which may sometimes be difficult and such refusals are not documented so far.

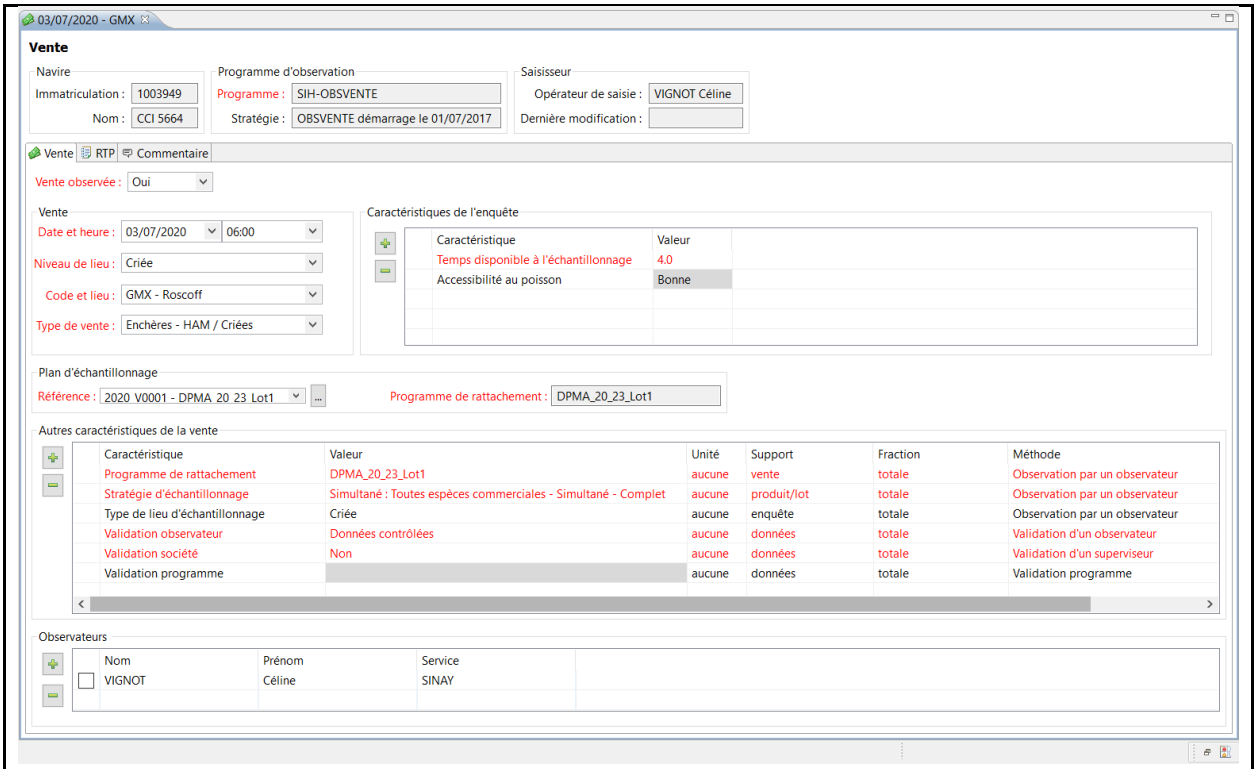
Monitoring of sampling progress within the sampling year: A Web Application for Observers (WAO[6]) has been developed for monitoring the sampling in real time and helping the observers on the field knowing the sampling allocations and generating the random draw for species to sample. In the picture below the Mayotte sampling frame is displayed (Dzaoudzi harbour V0790) and the realisation of quarter 1 (T1) and 2 (T2) are almost completed.

[6] WAO : web application for making the sampling plan available for observers, monitoring the progress of the realisation rate by daily recording of field observations.

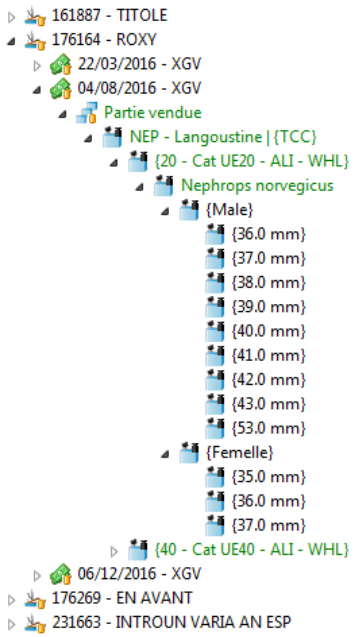


DATA CAPTURE

Means of data capture: The data capture application developed by Ifremer/SIH for all the observers is named ALLEGRO (pictures below). Until now, there is no use of electronic measuring board, only paper filling on the ground and use of ALLEGRO when back at the lab. It is to be noted that the scan of the papers filled during the visit to auction or landing site is included in the WAO application on the line referring to the relevant realisation.



Once noted the vessel sampled, the capture of length measurement is done using a specific screen (below)



Data capture documentation: [website]

Quality checks documentation: None. Quality checks are embedded in the data capture tool (Allegro) and in the importation to Harmonie database. Supplementary data checks are under development in ObsVentes mainland and will be adapted to Outermost region and documented in the second stage.

DATA STORAGE

National database: The Ifremer/SIH database is named HARMONIE. There is no link directly to HARMONIE but to its data catalogue.

International database: No.

Quality checks and data validation documentation: Quality checks are developed at every stage of the data life cycle. At first, the data capture tool (ALLEGRO) includes basic QC, then the data storage (HARMONIE) when synchronizing with ALLEGRO; those potential errors are then resolved by the observers before a resubmission of the data into Harmonie

SAMPLE STORAGE

Storage description: In ObsVentes programme there is no sample storage of any sort.

Sample analysis: All fish are measured on site and put back to their original box for sale.

DATA PROCESSING

Evaluation of data accuracy (bias and precision): Yes. A quality document is developed for each dataset prepared with the COST libraries. This document is available internally for experts willing to check the outputs before submission and is stored on a shared folder, together with the original datasets and the script used to generate the processed data. There is no literature on the issue, since the generic quality document is a lively document subject to permanent improvement. All elements regarding data accuracy demanded by the end-user are provided within the submitted data forms.

Editing and imputation methods: Yes. In the same document as above. Metiers and areas are grouped by proximities and similarities to the main item as demanded by the end-user (see extract of the document below for metier grouping). The differing metiers and areas are left unchanged and provided without sampling if not enough samples or fish have been collected for the stratum.

Quality document associated to a dataset: Yes. Same as above.

Validation of the final dataset: France sends hundreds of datasets to various end-user on a yearly basis. Only the major stocks and major data calls have a process of validation before sending. This topic is a case for concern and methods are constantly improved, workforce and tools are currently being reinforced to improve the current situation.

Commercial fishing trip – EOS (Elasmobranches on Shore)

MS: FRA

Region: North-East Atlantic, North Sea and Eastern Arctic

Sampling scheme identifier: EOS

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from January 2022 onward

Short description (max 100 words):

EOS (Elasmobranches on Shore) is the name of the sampling programme on-shore in France covering the Atlantic and the Channel main auctions. EOS is the acronym of 'Elasmobranches On-Shore' which covers samplings on elasmobranch' landings over a selected list of auctions. This list is based on the analysis of the average elasmobranch' landings based on national statistics during the reference period 2018-2020. In order to increase the sampling effort on elasmobranchs' landings, a mutualization of the sampling scheme "Obsventes" and "EOS" has been tested in 2021 and will begin in January 2022 onwards (figure 1).

The objective of the sampling scheme is to collect length samples from commercial fisheries on-shore for all elasmobranches species landed (commercial and PETS). While "EOS" sampling scheme follows all elasmobranch species within the selected auctions, "Obsventes" sampling scheme collects data only on mandatory species within another set of selected auctions.

Sampling scheme identifier: EOS / Obsventes - : Not required	Sampling frame identifier	Auctions
Obsvente	V0001	Boulogne-sur-Mer
EOS	**V0700**	Cherbourg, Audierne, Brest, Concarneau, Saint-Q Portrieux, Erquy, Le Guilvinec
Obsvente	V0003	Dieppe
Obsvente	V0005	Fécamp
-	V0006	Grandcamp (Grandcamp-Maisy)
EOS	**V0701**	Port-en-Bessin (Port-en-Bessin-Huppain)
-	V0011	Douarnenez
-	V0013	Granville
-	V0015	Lanildut
-	V0016	Loctudy
Obsvente	V0017	Lorient
-	V0018	Quiberon (Port-Maria)
-	V0019	Roscoff
-	V0020	Saint-Guénolé (Penmarch)
-	V0021	Saint-Malo
-	V0023	Arcachon
Obsventes	V0024	L'Herbaudière (Noirmoutier-en-l'Ile)
Obsvente	V0025	La Cotinière (Saint-Pierre d'Oléron)
Obsvente	V0026	La Rochelle (Chef de Baie et port Atlantique)
-	V0028	Le Croisic
EOS	**V0702**	La Turballe, Les Sables-d'Olonne
-	V0030	Royan
Obsvente	V0031	Saint-Gilles-Croi--de-Vie
Obsvente	V0032	Saint-Jean-de-Luz, Ciboure
-	V0033	Cap d'Agde
Obsvente	V0034	Le-Grau-du-Roi
-	V0035	Port-la-Nouvelle
-	V0036	Sête, tous les ports
-	V0038	Port-Vendres, tous les ports

Figure 1 : Mutualization of "EOS" and "Obventes" on-shore sampling schemes in inland France.

Description of the population

Population targeted: The population targeted is the landed elasmobranches fishes by the commercial fisheries catching these species. The primary sampling units (PSU) are the auctions (port*day).

Population sampled:

NORTH ATLANTIC: 9 auctions selected for their high landings of elasmobranches species listed in table 2.1 based on 2018-2020 average landings. No port*day samplings during week-end vessel trips to avoid sampling error (e.g. possibly 2 trips/vessel on Monday sale). Monthly planning of samplings based on auction forecasts.

NORTH SEA AND EASTERN ARCTIC: 1 auction selected for its high landings of elasmobranches species listed in table 2.1 based on 2018-2020 average landings. No port*day samplings during week-end vessel trips to avoid sampling error (e.g. possibly 2 trips/vessel on Monday sale). Monthly planning of samplings based on auction forecasts.

Since EOS is complementing ObsVentes mainland sampling scheme as shown in figure 1, the same out of frame applies (minor ports).

Stratification:

NORTH ATLANTIC: Population stratified in 2 geographical lots along the coast. Each lot is then stratified by auction or alternated auctions.

NORTH SEA AND EASTERN ARCTIC: Population stratified in 1 geographical lot.

Sampling design and protocols

Sampling design description:

EOS sampling scheme type (commercial fishing trip) is divided in 3 sampling frame identifier V0700, V0701 and V0702. Each frame covers all metiers landing elasmobranches.

NORTH SEA AND EASTERN ARCTIC:

Sampling frame identifier V0701 is composed of 1 auction (Port en Bessin) located in Normandy. Method of PSU selection is a NPJS, the auction is visited every month.

NORTH ATLANTIC:

Sampling frame identifier V0700 is composed of 3 auctions located from Normandy to north Brittany and 4 in south Brittany. Method of PSU selection is NPJS; 4 auctions (Erquy/Saint Quay Portrieux; Audierne/Concarneau) from north and south Brittany are alternately visited; the 3 others (Cherbourg, Brest, Le Guilvinec) are visited each month.

Sampling frame identifier V0702 is composed of 2 auctions (La Turballe, Les Sables d'Olonne) located in the Bay of Biscay. Method of PSU selection is NPJS, each auction visited every month.

Each auction or alternated auctions are sampled every month. During sampling, all vessel/metiers can be targeted. If the number of vessels is too high, observers must select vessels with the highest tonnage and diversity from the list of elasmobranches species selected for sampling of biological variables in table 2.1 (fig.2). For this species, only the HUC fraction is sampled. For the biggest commercial sizes (10 and 20), 20 individuals must be observed while the number is 35 for the other commercial sizes. Selected specimen must come from boxes selected randomly. Sex and length (total or specific) are recorded on each individual.

In addition, all elasmobranches defined as PETS (fig.3) by EU-MAP regulation and known as potentially present in landings (MNHN sources) are systematically sampled on all vessels registered on sales.

Region	Species selected for sampling of biological variables
North Sea and Eastern Arctic	Mustelus spp.
North Sea and Eastern Arctic	Raja clavata
North Sea and Eastern Arctic	Scyliorhinus canicula
North-East Atlantic	Galeorhinus galeus
North-East Atlantic	Leucoraja naevus
North-East Atlantic	Mustelus spp.
North-East Atlantic	Raja brachyura
North-East Atlantic	Raja clavata
North-East Atlantic	Raja montagui
North-East Atlantic	Scyliorhinus canicula
North-East Atlantic	Scyliorhinus stellaris

Figure 2 : List of species selected for sampling of biological variables

Species listed in reference to EU-MAP 2022-2027 table 1		Species listed in international conventions and RFMO in reference to EU-MAP 2022-2027 table 2				
Species	**RFMO/RFO/IO and Area**	**OSPAR (NEAFC) updated june 2008**	**UNEP (GFCM) updated september**	**ICCAT updated july 2010**	**NA&NSEA**	**MED**
Alopias superciliosus	all areas ICCAT, CTOI, WCPFC			✓	✓	✓
Alopias vulpinus	all areas ICCAT, WCPFC			✓	✓	✓
*Dipturus batis, Dipturus intermedius**	6, 7a, 7e-k; 8, 9a	✓	✓		✓	✓**
*Dipturus nidarosiensis**	none				✓	✓
*Dipturus oxyrhinchus**	none				✓	✓
Galeorhinus galeus	1, 2, 3, 4, 7d, 5-10, 12		✓	✓	✓	✓
Isurus oxyrinchus	all areas ICCAT, CTOI, WCPFC		✓	✓	✓	✓
Lamna nasus	all areas ICCAT, CTOI, WCPFC	✓	✓	✓	✓	✓
Prionace Glauca	all areas ICCAT, CTOI, WCPFC			✓	✓	✓
Rostroraja alba	5, 6, 7 (excl. 7d), 8, 9, 12 and 14	✓	✓		✓	✓**
Squatina squatina	none	✓	✓		✓	✓**
Squalus acanthias	1, 2, 3a, 4 and 7d, 5, 6, 7 (excl. 7d), 8, 9, 12 and 14, GSAs 28-29	✓			✓	
Leucoraja circularis	6, 7		✓			✓**

* Dipturus sp. : 3 species followed as often mislabeled in landings
** only through SciObsAtSea samplings

Figure 3 : List of elasmobranches listed as PETS and known as potentially present in landings (MNHN sources) in reference with EU-MAP 2022-2027 table 1 and 2.

Is the sampling design compliant with the 4S principle?: ~~Y/N/~~NA (NA for e.g. surveys and diadromous and recreational sampling schemes)
NA, the moment to visit an auction is not randomly selected within each month for several reasons such as observer's availability or avoidance of visits to auctions with no or little elasmobranches to sample. If time allow, all vessels must be sampled. Otherwise a selection is done among the vessels but this selection is not done randomly. Selected vessels are the ones with the highest tonnage and diversity from the list of elasmobranches species. For each vessel, all species must be measured.
Regional coordination: No regional coordination

Link to sampling design documentation: No documentation exist, see short description of the sampling scheme name.

Compliance to international recommendations: Yes. The sampling design is a variant of the option D of the 4S designs detailed in WKPICS3 (ICES, 2014) page 42. The collection of length measurements is in line with international good practice (high number of samples, low number of individuals measured per sample (<50)) and international standards as set up by end-users such as ICCAT, ICES and GFCM.
ICES. 2014. Report of the third Workshop on Practical Implementation of Statistical Sound Catch Sampling Programmes, 19-22 November 2013, ICES HQ, Copenhagen, Denmark. ICES CM2013/ACOM:54. 109 p

Link to sampling protocol documentation: https://borea.mnhn.fr/fr/programme-recherche/feamp-eos

Compliance to international recommendations: The collection of length measurements is in line with international good practice (high number of samples, low number of individuals measured per sample (<50)) and international standards as set up by end-users such as ICCAT, ICES and GFCM.

Sampling implementation

Recording of refusal rate: No. Access to auction and to fish landed is generally accessible, and when refusals occur they are generally quickly resolved.

Monitoring of sampling progress within the sampling year: Monitoring from MNHN and subcontractors' visits are followed using an Excel dynamic table. If an auction cannot be visited within a month for any reasons (sanitary crises, insufficient forecasting, auction closed to scientific observers), sampling effort is postponed the next month.

Data capture

Means of data capture: Data capture (HUC fraction) and PETS are entered via an input client (see screenshot) developed under Microsoft Access software. It is a digital replica of a sample sheet used to collect all commercial and biological information of a fishing trip.

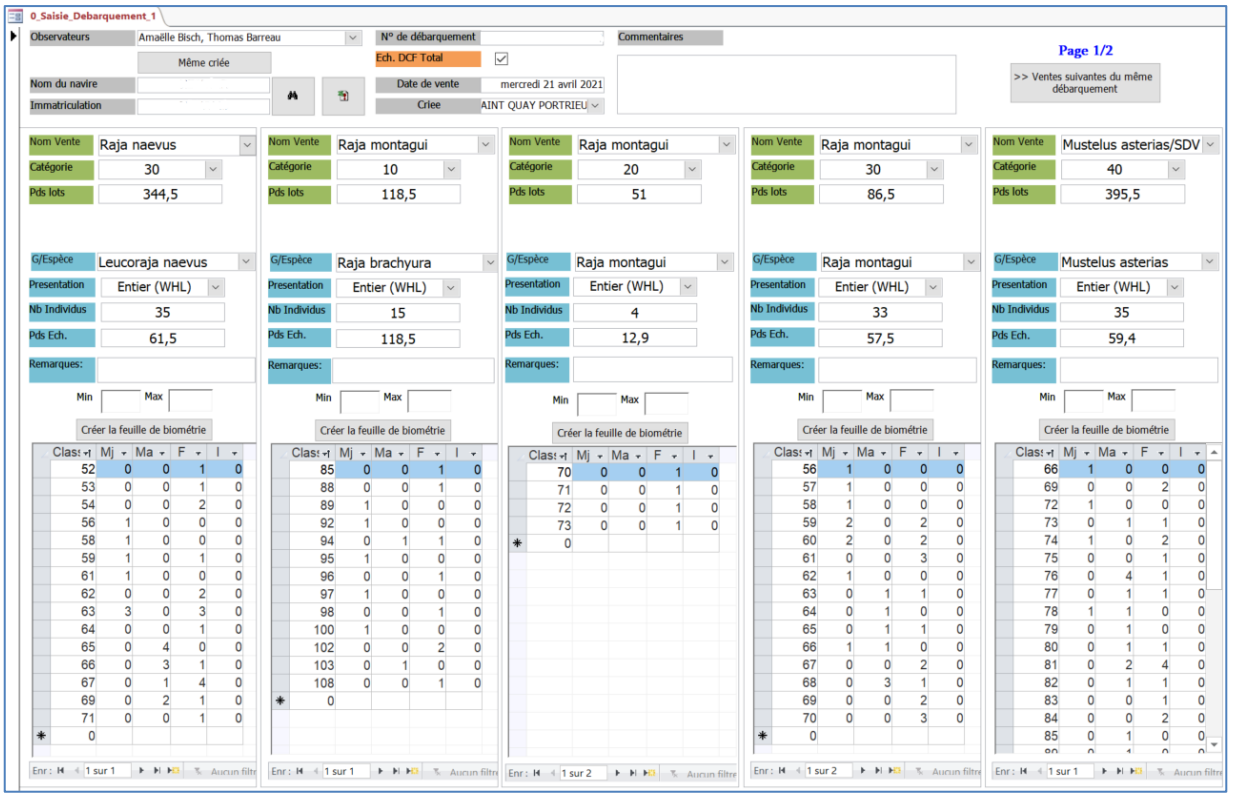


Figure 4: Screenshot of the MNHN data capture entry form

Data capture documentation : Internal documention available on request (English translation in progress). The documentation is accessible only to MNHN agent working on the DCF regulation. It describes the structure of the data base, tables and fields as well as the procedures of data entry, checking and validating procedures. Before data entry, all commercial data are cross check with official documents provided by the management of an auction sampled. All commercial documents related to a visit are archived into pdf format.

Quality checks documentation:

Same document as data capture documentation. Once data capture are validated by official commercial documents and transcript in the MNHN DB through input client, a series of queries are applied to each table to identify errors in the input rows: consistency checks with reference tables; commercial names (FAO)/latin species sampled; total/sampled weights and numbers. Length outlier detection is done by taxa, sex and maturity for male see figure 5. Weight outlier detection is done in the same way through length-weight diagnostic by taxa, sex and commercial presentation (whole or gutted), see figure 6.

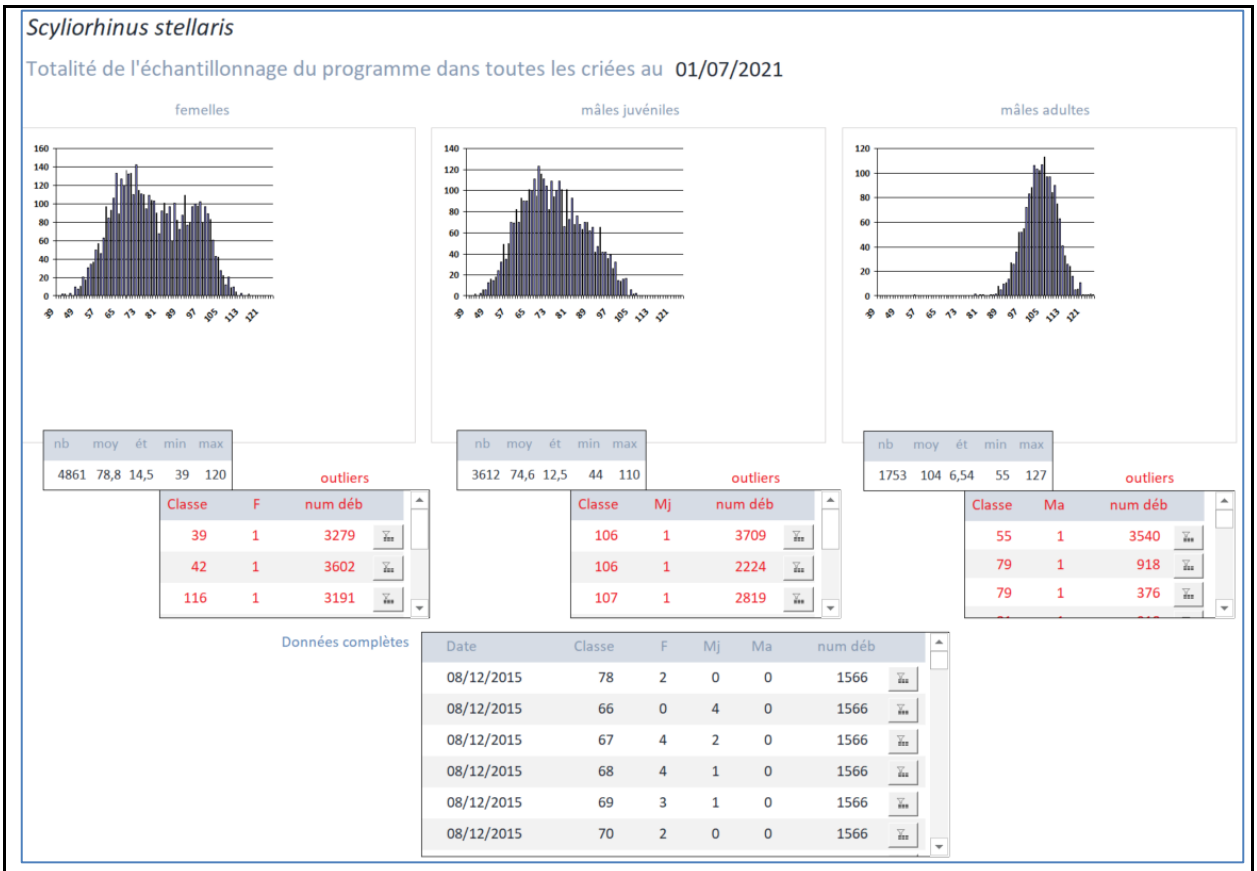


Figure 5: Screenshot of the diagnostic for length outlier detection.

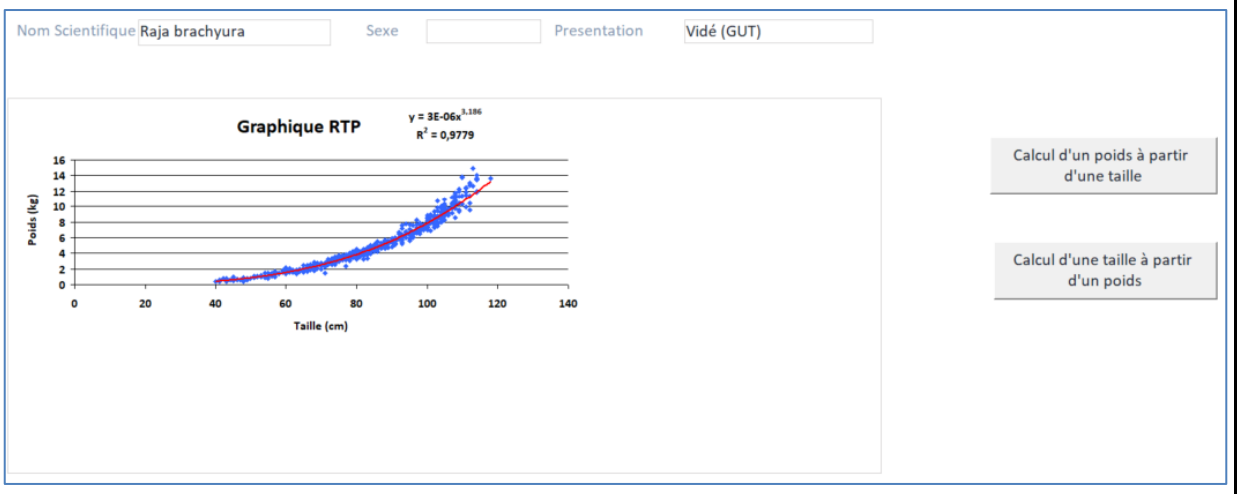


Figure 6: Screenshot of the diagnostic for weight outlier detection.

Biological parameters specific – Tunabio

MS: FRA

Region: Other regions

Sampling scheme identifier: Tunabio

Sampling scheme type: Biological parameters specific

Observation type: SciObsOnShore

Time period of validity: from 2012 onward

The sampling scheme aiming at collecting biological features (length, weight, sex ratio and sexual maturity) from commercial landings on foreign shores of purse seiner for major tuna species and by-catch, listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers two regions which are governs by tuna RFMOs: IOTC and ICCAT.

The sampling is coordinated by IRD and is operated on the field by subcontractors.

Description of the population

Population targeted:

The population targeted are the major tropical tuna and bycatch stocks of Atlantic and Indian ocean exploited by the European purse seine fishery.

Population sampled:

The sampled population are the three target tropical tuna species of Atlantic and Indian ocean exploited by the European purse seine fishery landed in major ports. Major tropical tuna species targeted are yellowfin tuna (*Thunnus albacares*), bigeye tuna (*Thunnus obesus*) and skipjack tuna (*Katsuwonus pelamis*). In the Atlantic Ocean, six bycatch species are also sampled: bullet tuna (*Auxis rochei*), common dolphinfish (*Coryphaena hippurus*), frigate tuna (*Auxis thazard*), little tunny *(Euthynnus alletteratus*), rainbow runner (*Elagatis bipinnulata*) and wahoo (*Acanthocybium solandri*).

Only two major ports are covered by the sampling scheme: Abidjan (Ivory Coast) and Victoria (Seychelles). All other harbours are out of frame.

The production of the factories concerns the three major species. Damaged or too small individuals are not accepted by the factories and are therefore sent to the local market. Bycatch species are not purchased by the factories and cannot be sampled via the production lines.

Stratification:

Population is stratified according to the following features:

- the species
- the sex
- the size classes
- the quarter
- the fishing area

Sampling design and protocols

Sampling design description:

The objective of the sampling plan is to have a number of fish representative of the population exploited by the purse seiners throughout the year. The plan is stratified by quarter and size classes. It is desirable

that the samplings be spread out during each quarter rather than concentrated over a few days as this makes it possible to have fish from different schools, areas and fishing periods.
The main objective of stratification is to sample the maximum range of sizes for tuna and bycatch species and complete the sampling plan for each quarter based on the availability of fish at the factory. Additional purchases should be made if necessary to comply with the sampling plan.

Is the sampling design compliant with the 4S principle?:
Y - In Abidjan, only yellowfin tuna is available at the factory. Bigeye and skipjack tunas must be purchased from French shipowners. In Victoria, only fish under 100 cm for the three major species are available at the factory. Large yellowfin and bigeye tunas must be purchased from French purse seiners landing in the Seychelles.
Logbooks are collected before each landing and analysed to identify the species and commercial categories that can be purchased. Depending on the objectives (number of fish per size class and fishing months sampled) and previous sampling, sizes per species are selected to fill in the gaps.

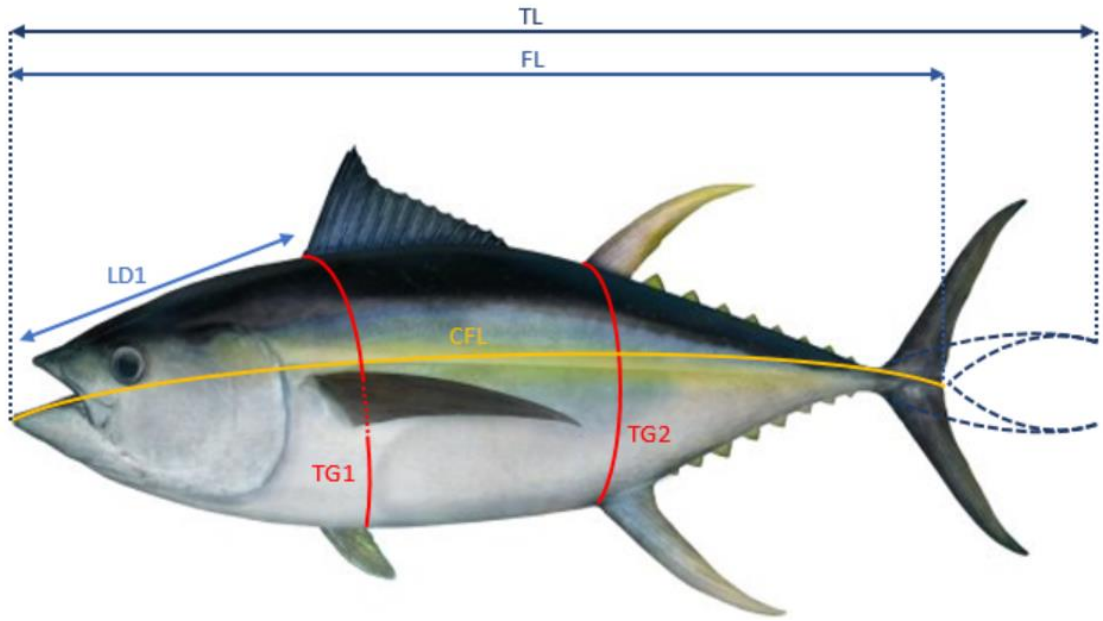
The same procedure is followed for bycatch species.

Regional coordination:
N, the sampling design and protocols were not developed as part of a regional or multi-lateral agreement.

Link to sampling design documentation:
See “sampling design description”.

Compliance with international recommendations:
N

Link to sampling protocol documentation:
Measurements on the whole thawed fish are taken:
(a) TL: total length
(b) FL: fork length
(c) LD1; pre-dorsal length
(d) CFL: curve fork length
(e) TG1 and TG2: thorax girths
(f) whole fish weight



An incision of the fish from the anus to the operculum is made and the various organs are extracted to be weighed. The gutted fish weight is measured. The gonads are weighed. Sex and maturity stage are identified by macroscopic examination. The liver weight is measured taking care to detach its different lobes from the rest of the organs. The full stomach is extracted by cutting off the initial end of the oesophagus (at the level of the mouth) and weighed, then its contents completely emptied by severing. The chyme can be washed out by washing the inside of the stomach. The empty stomach is weighed. An identification of the main taxonomic groups of the prey present in the stomach is carried out. The rest of the viscera (heart, pyloric cecum, intestine, spleen, gall bladder, etc.) is grouped together and weighed.

Compliance with international recommendations:
Y – ICCAT manual: https://www.iccat.int/Documents/SCRS/Manual/CH4/CH4-FRA.pdf
FAO : https://www.fao.org/3/f0752f/f0752f03.htm

Sampling implementation

Recording of refusal rate:
Y

Monitoring of sampling progress within the sampling year:
In order to guarantee the quality of the collection and the achievement of the objectives, the data are sent every month to the IRD's Exploited Tropical Pelagic Ecosystems Observatory (Ob7) for control. The main objective of this team is the collection, validation, archiving and analysis of data from the French tropical tuna fishery in the Indian and Atlantic oceans. The sampling days and the sizes sampled for each species are monitored. A quarterly report is carried out with the service providers to adjust the sampling plan.

Data capture

Means of data capture:
Samplings are done with the following equipment:

1. a scale 4 kg (0.1 gram accurate, for weight measurements)
2. a scale 6 kg (1 gram accurate, for weight measurements)

3. a scale 15 kg (1 gram accurate, for weight measurements)
4. a scale 150 kg (50 gram accurate, for weight measurements)
5. a fish ruler (for size measurements)
6. a tape measure (for size measurements)
7. a calliper (for size measurements)
8. a maturity scale according:
    a. for tunas: Collect. Vol. Sci. Pap. ICCAT, 76(7): 111-148 (2019), https://www.iccat.int/Documents/CVSP/CV076_2019/n_7/CV76007111.pdf
    b. for elasmobranches: Wkmsel Report 2010, ICES CM 2010/ACOM: 48, https://www.ices.dk/sites/pub/Publication%20Reports/Expert%20Group%20Report/acom/2010/WKMSEL/WKMSEL%202010.pdf.

Data are entered in the Tunabio excel file, which is also used for entering environmental data extracted from logbook and well plans.

Data capture documentation:
Biological data: all biological data are entered in the Excel file Tunabio_OI, in the SPECIMEN sheet. There are control and validation points (reference lists, cell format, type of data, etc.). A blank file must be used for each month of collection, to facilitate tracking of collection and corrections. Any element on the sampling that cannot be entered in the columns of the different variables must be entered in the comment column (fish not thawed, incomplete stomach content, etc.).

Environmental data: the vessel and the well(s) are noted after going through the factory or on the boat for purchases. The idea is to find the corresponding data. In a well, there may be several sets, and therefore several dates and fishing positions. It is necessary to seize all the possibilities of the wells of origin for each fish. It is often impossible to know the well. In this case, all dates and fishing positions must be entered (in MULTIPOINT format). The same position should only appear once. All environmental data are entered in the ENVIRONMENT sheet. There are also control and validation points. Any item on the fishing trip that cannot be entered in the columns of the various variables must be entered in the comment column. The METADATA sheet, present in this same file, summarizes all the data entered and the checkpoints. Although the data is entered by computer, it is essential to keep the paper sheets on which the data is recorded (always keep the first source of information), and to scan them. A fish identifier is unique in the SPECIMEN sheet but can be multiple in the ENVIRONMENT sheet. The absence of data is indicated by the code "na".

Quality checks documentation:
N, no quality check documentation exists. The validation is done manually by checking the validity ranges of the data.

Data storage

National database:
N – Data are stored in Tunabio excel file.

International database:
NA

Quality checks and data validation documentation:

N, no quality check documentation exists. The validation is done manually by checking the validity ranges of the data. A R script for more demanding data control is also being written and should be ready in 2022, as well as the documentation.

Sample storage

Storage description: N. No biological material collected through this scheme.

Sample analysis: N. No biological material collected through this scheme.

Data processing

Evaluation of data accuracy (bias and precision):
The data collected are raw. No evaluation of data accuracy is done and planned.

Editing and imputation methods:
No editing and imputation methods are planned.

Quality document associated to a dataset:
A data paper for biological data is being drafted and a DOI will be associated on SEANOE (https://www.seanoe.org/). New data will be integrated annually.

Validation of the final dataset:
All data are validated during the data capture in Tunabio by an expert.

Commercial fishing trip – TunaSamplingOnShore

MS : FRA

Region: Other regions

Sampling scheme identifier: TunaSamplingOnShore

Sampling scheme type: Commercial fishing trip

Observation type: SciObsOnShore

Time period of validity: from 1998 onward

Short description (max 100 words):
The sampling scheme aiming at collecting length samples and species composition from commercial landings on foreign shores of purse seiner and baitboat for all tuna species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers two other regions which are governs by tunaRFMOs: IOTC and ICCAT.

The sampling is coordinated by IRD under the supervision of the French Directorate for Fisheries (DPMA) and is operated on the field by subcontractors.

Description of the population

Population targeted:
The population targeted are the major tropical tuna stocks of Atlantic and Indian ocean exploited by the French purse seine and baitboat fishery. The primary sampling unit is the vessel, purse seiners and baitboats of the corresponding fleet.

Population sampled:
The sampled population are the major tropical tuna stocks of Atlantic and Indian ocean exploited by the French purse seine and baitboat fishery landed in major ports. Only major ports are covered by the sampling scheme: Dakar (Senegal), Abidjan (Côte d'Ivoire) and Victoria (Seychelles). As out of frame, the sample design excludes landings in minor ports: Port-Louis (Mauritius), Diego (Madagascar), Tema (Ghana), where the french purse seiner lands sometimes
Major tropical tuna species targeted are Yellowfin tuna (i), bigeye tuna (Thunnus obesus), skipjack tuna (Katsuwonus pelamis) and albacore tuna (Thunnus alalunga).

Stratification:
Population is stratified according to four features:

- Population stratified in 2 geographical lots: "Atlantic Ocean Central East and West" (FAO areas 34, 41 and 47) and "Indian Ocean" (FAO areas 51 and 57). Each lot is governed by a dedicated tuna RFMO: ICCAT and IOTC, respectively.
- The fisheries are the PS/BB. Each fisheries have his own organisation and his dedicated catches.
- Port
- Vessel

Sampling design and protocols

Sampling design description:

In the case of tropical tuna fisheries, it is imperative to estimate the species composition of landings insofar as these are weighted according to commercial categories based more on length size than on

species, which is a major source of bias. The catch for each species can be estimated by crossing information from fishing logbooks, VMS data and information about landings provided by the producer organisation, as well as from the scientific sampling of species composition at the landing site. Sampling is carried out concurrently in major ports. All vessels (PSU) and almost every landings (SSU) are covered and wells (TSU) within landings are selected according quality criteria (fishing mode, homogeneity in species composition). Finally simple random sampling is performed on selected wells. The aim of such hierarchical design is to cover spatial and temporal dimension of the catch by the fisheries. This involves a minimum number of samples for each stratum and a predetermined population of individuals for each sample. Adherence to these procedures results in an important number of sampled and measured individuals, this arises from the fact that to achieve a reasonable level of precision for the estimation of the species composition necessary to examine many individuals for each sample (500 for log sets, 200 for free school sets).

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

Regional coordination:
The sampling scheme is analysed in joint workshops (T3 sub-ISSG) in the frame of RCG Large Pelagic, with other scientific institutes using the same methodology (IEO (Spain), SFA (Seychelles))

Link to sampling design documentation:
Pianet R., P. Pallares and Ch. Petit, 2000. New sampling and data processing strategy for estimating the composition of catches by species and sizes in the European purse seine tropical tuna fisheries. IOTC-WPDCS/2000/10
Duparc, A., P. Cauquil, M. Depetris, P. Dewals, D. Gaertner, A. Hervé, J. Lebranchu, F. Marsac, and P. Bach. 2018. Assessment of accuracy in processing purse seine tropical tuna catches with the T3 methodology using French fleet data. Case of the French fleet in Indian Ocean. Pages 1–19 Report of the 20th session of the IOTC Working Party on Tropical Tunas. IOTC, Victoria, Seychelles
10.5281/zenodo.3255565

Compliance with international recommendations:
Yes, the sampling design and protocols follow the RFMOs guidelines of sampling.

Link to sampling protocol documentation:
Pascal Bach et al., « Sampling on-shore procedures for tropical tuna landed by purse seiner in the Atlantic and Indian oceans » (septembre 2018), fdi:010075957

Compliance with international recommendations: Yes, the sampling design and protocols follow the RFMOs guidelines of sampling.

Sampling implementation

Recording of refusal rate:
Y

Monitoring of sampling progress within the sampling year:
For onshore on foreign shores, the sampling design and protocols follow the RFMOs guidelines of sampling. Outliers and anomalous registrations have been detected using statistical techniques and routinely applications which avoid their input.
A meeting of a steering group comprising IRD and sampling companies is held on a semester basis. The mandate of the steering group is to discuss the realisation, address the main issues encountered and

prepare for the next semester.

Data capture

Means of data capture:
IRD has developed a fully-fledged software for capturing the fisheries landings and sampling data on foreign shores, named AVDTH. This software offers scientists and technicians the complete palette of forms required for the entry of all types of data to be collected as part of EU-MAP and during fieldwork in general.

Data capture documentation:
Dewals Patrice, Damiano Alain, Floch Laurent, Cauquil Pascal. (2017). AVDTH : Acquisition Validation des Données Thon : Manuel de l'utilisateur (màj 27/07/2017). Sète : IRD, 75 p. multigr. fdi:010082886

Quality checks documentation:
Y. All quality checks are detailed on the AKaDo website (https://git.outils-is.ird.fr/ob7/akado2/-/wikis/home) which is the software dedicated to these tasks.

Data storage

National database:
T3 database is designed to store the raw data collected from logbook, landings and sampling onshore on foreign shores, and the corrected data after T3 processing. There is no link directly to T3 but in 2022 the metadata will be accessible to a data catalogue.

International database:
NA

Quality checks and data validation documentation:
The data validation documentation is still in development. The latest version is available online : https://ob7-ird.github.io/t3/

Sample storage

Storage description: NA

Sample analysis: NA

Data processing

Evaluation of data accuracy (bias and precision):
See documentation below

Editing and imputation methods:
Articles:
Duparc, A., P. Cauquil, M. Depetris, P. Dewals, D. Gaertner, A. Hervé, J. Lebranchu, F. Marsac, and P. Bach. 2018. Assessment of accuracy in processing purse seine tropical tuna catches with the T3 methodology using French fleet data. Case of the French fleet in Indian Ocean. Pages 1–19 Report of the 20th session of the IOTC Working Party on Tropical Tunas. IOTC, Victoria, Seychelles
Duparc, A., V. Aragno, M. Depetris, L. Floch, P. Cauquil, J. Lebranchu, D. Gaertner, F. Marsac, and P. Bach. 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 21st session of the IOTC Working Party on Tropical Tunas. IOTC, San Sabastián, Spain.
Duparc, A., M. Depetris, P. Cauquil, and J. Lebranchu. 2020a. Improved version of the Tropical Tuna

Treatment process: new perspectives for catch estimates of tropical purse seine fishery. Pages 1–21 Report of the 22nd session of the IOTC Working Party on Tropical Tunas - Stock Assessment Meeting. Virtual Meeting.
Duparc, A., M. Depetris, L. Floch, P. Cauquil, P. Bach, and J. Lebranchu. 2020b. Development status of the new Tropical Tunas Treatment (T3) software. Pages 1–5 Report of the 22nd session of the IOTC Working Party on Tropical Tunas - Data preparatory meeting. Online/virtual.

Software:
Depetris, M., A. Duparc, L. Floch, P. Cauquil, and J. Lebranchu. 2020. OB7-IRD/t3: Beta version of T3 software. Zenodo. Url - https://doi.org/10.5281/zenodo.3878125. -

The online documentation:
https://ob7-ird.github.io/t3/

Quality document associated to a dataset:
There is no quality document. However, the estimation process followed are described in the report of RCG LP's Tropical Tuna ISSG.
Validation of the final dataset:
N

Commercial fishing trip – LocalMarketSamplingOnShore

MS : FRA

Region: Others regions

Sampling scheme identifier: LocalMarketSamplingOnShore

Sampling scheme type: Commercial fishing trip

Observation type: SCiObsOnShore

Time period of validity: from 1998 onward

Short description (max 100 words):

Local market sampling scheme aims at collecting data onshore of the landed part of the purse seiner and baitboat catch destined to the local market, i.e. not sold the canneries for all species listed in Table 1 of the EU MAP Delegated Decision annex. The scheme covers the convention area of ICCAT. The objective of this sampling scheme is the estimations of the catch by species landed toward the local market using length and weight samplings paired with survey approaches.

The sampling is coordinated by IRD and is operated on the field by subcontractors.

Description of the population

Population targeted:

The population targeted are the fish populations of Atlantic exploited by the French purse seine (PS) and baitboat (BB) fishery.

Population sampled:

The sampled population are the fish populations of Atlantic exploited by the French purse seine and baitboat fishery landed in major ports. Only major ports are covered by the sampling scheme: Dakar (Senegal), Abidjan (Côte d'Ivoire). As out of frame, the sample design excludes landings in minor ports. The primary sampling unit is the vessel*trip of purse seiners and bait boats of the corresponding fleet. Sampling coverage is exhaustive.

Stratification:

Population is stratified according to three features:

- The fisheries are the PS/BB. Each fisheries have his own organisation and his dedicated catches.
- Port
- Vessel

Sampling design and protocols

Sampling design description:

Part of the catch of purse seiners, not sold to the canneries, is landed towards another commercial flow, names local market. The local market is composed of bycatch species* but also tuna species targeted by the fishery, mainly small or damaged individuals who are not accounted for in the species composition and in catch at size estimates from main sampling (Large pelagic sizes on foreign shores). The catch landed toward the local market represent a non negligible part of the catch and so required an estimation of its composition.

Fish destined to the local market are separated from the fish destined to the cannery when they go out

of the well onboard. All fish are piled up, losing the fine information of the set (location, date, catch size). All vessel*trip (PSU) are covered by the sampling. Some of the species are sorted and some not, as the tuna species. Thus, the species composition of the tuna mix of each trip is estimated measuring and identifying 300 individuals onboard, where fish are manipulable. Then fish are landed in lots, mono or multi-specific, with varied packaging (e.g., drop on converters, tarpaulins or bags). The data collection in the local market involves estimating the weight and the species composition of every lot. Fishes unloaded at quay cannot be handled. Operator estimates species composition in percent by visual estimation for the multi-specific lots. In mono specific lot, the species is identified. Finally, most of the lot pass through a weighted bridge before leaving the port area. Their weight is collected to the port technician. Remaining lots have a reference weight estimated from experimental data.

*The few PETS landed in the local market are exhaustively counted and identified at quay.

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

Regional coordination:
Y. No agreement is put in place, but the sampling scheme is jointly developed and applied by EU-FR and EU-SP fleet in the frame of RCG Large Pelagic, with other scientific institutes using the same methodology (IEO (Spain)).

Link to sampling design documentation:

Chavance, P., J. B. Amon Kothias, P. Dewals, R. Pianet, M. J. Amandè, A. Delgado de Molina, and A. Djoh. 2010. Statistic on tuna surface fishery"s bycatch landed in abidjan, côte d'Ivoire, for the 1982-2009 period. Collect. Vol. Sci. Pap. ICCAT 66:2104–2112.

Duparc, A., M. J. Amandé, M. Lesage, P. Cauquil, D. Gaertner, P. Pascual Alayon, and P. Bach. 2019. Local market of the tropical purse seine fishery: update and perspective for its assessment in Abidjan. Col.Vol.Sci.Pap. ICCAT 76:983–991.

Duparc, A., M. J. Amandé, P. Cauquil, L. Floch, P. Pascual Alayon, V. Rojo and D. Yala. 2021. Methodology for the estimation of tuna's catch in local market for the EU purse seine fishery in the Atlantic Ocean. Col.Vol.Sci.Pap. ICCAT (*submitted*).

Kothias Amon, J. B., F. X. Bard, and A. Hervé. 1996. Mise à jour des quantités de Faux poissons débarquées par les senneurs à Abidjan. Collect. Vol. Sci. Pap. ICCAT 45:227–228.

Compliance with international recommendations:
Yes, the sampling design and protocols follow the RFMOs guidelines of sampling.

Link to sampling protocol documentation:
IRD-Ob7. 2011. Manuel d'échantillonnage au port – Faux poisson. Internal Document

Compliance with international recommendations:
Yes, the sampling design and protocols follow the RFMOs guidelines of sampling.

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year:

For onshore on foreign shores, the sampling design and protocols follow the RFMOs guidelines of sampling. Outliers and anomalous registrations have been detected using statistical.
A meeting of a steering group comprising IRD and sampling companies is held on a semester basis. The mandate of the steering group is to discuss the realisation, address the main issues encountered and prepare for the next semester.

Data capture

Means of data capture:
IRD has developed a fully-fledged software for capturing the fisheries landings and sampling data on foreign shores, named AVDTH. This software offers scientists and technicians the complete palette of forms required for the entry of all types of data to be collected as part of EU-MAP and during fieldwork in general.
Data capture documentation : Dewals Patrice, Damiano Alain, Floch Laurent, Cauquil Pascal. (2017). AVDTH : Acquisition Validation des Données Thon : Manuel de l'utilisateur (màj 27/07/2017). Sète : IRD, 75 p. multigr. fdi:010082886

Quality checks documentation: No quality checks are done until now.

Data storage

National database:
The database containing the collected data is AVDTH

International database:
NA

Quality checks and data validation documentation:
No quality checks are done until now.

Sample storage

Storage description: NA – no biological material taken through this scheme.

Sample analysis: NA – no biological material taken through this scheme.

Data processing

Evaluation of data accuracy (bias and precision): Y
Recent studies investigate the data collection process and its possible way of improvement.

Duparc, A., M. J. Amandé, M. Lesage, P. Cauquil, D. Gaertner, P. Pascual Alayon, and P. Bach. 2019. Local market of the tropical purse seine fishery: update and perspective for its assessment in Abidjan. Col.Vol.Sci.Pap. ICCAT 76:983–991.

Duparc, A., M. J. Amandé, P. Cauquil, L. Floch, P. Pascual Alayon, V. Rojo and D. Yala. 2021. Methodology for the estimation of tuna's catch in local market for the EU purse seine fishery in the Atlantic Ocean. Col.Vol.Sci.Pap. ICCAT (*submitted*).

Editing and imputation methods: Y

Duparc, A., M. J. Amandé, P. Cauquil, L. Floch, P. Pascual Alayon, V. Rojo and D. Yala. 2021. Methodology for the estimation of tuna's catch in local market for the EU purse seine fishery in the Atlantic Ocean. Col.Vol.Sci.Pap. ICCAT (*submitted*).

Quality document associated to a dataset:
No

Validation of the final dataset: N

Recreational (off site surveys) – Off-site survey on recreational fisheries through online panel

MS : France
Region: North Sea and Eastern Artic, North-East Atlantic, Mediterranean and Black Sea
Sampling scheme identifier : Off-site survey on recreational fisheries through online panel
Sampling scheme type: recreational (off site surveys)
Observation type: self-sampling at sea
Time period of validity: 2021-2023
Short description (max 100 words): Panel of recreational fishers are followed for the 3 years from 2021 to 2023. This panel of recreative fishermen report their catches and biological data through a phone application. Catches at national level are then estimated based on the results of a framing survey conducted in 2021 to estimate the penetration rate of recreational fishing within the French population.
Description of the population
Population targeted: - Framing survey : Recreational fishers in metropolitan France including Corsica. - Panel survey : Recreational fishers in metropolitan France including Corsica. **Population sampled:** - Framing survey : Framing survey is required as no licence or authorization system is set yet in France for recreational marine fishermen (authorization are limited to a reduced number of species or areas). The study leverages online panel techniques to obtain a sample of 10 042 respondents, representative of the French population aged 15 and over. This sample was constructed on the basis of quotas for the aggregated socio-professional categories, geographic zone of residence (French department, size of agglomeration, and distance from the coast), age and gender of the respondents. The quotas were based on the data structures and census data published by INSEE. - Panel survey : 500 recreational fishermen are targeted, with a minimum required of 200 and 1,039 registered at the beginning of the survey. These fishermen are recruited through the framing survey, the application FishFriender community, among fishing associations and also with the help of social networks. The sample has to comply with quotas (by fishing mode, fishing zone and fishing avidity) and is adjusted with social and demographic categories defined by INSEE. **Stratification:** - Framing survey : a questionnaire was filled out by each member of the sample. The survey results were adjusted on the basis of the quota variables to correct any remaining differences with the data set from INSEE and confirm that the results are representative of the target population. The secondary objective of the phase 1 framing study is to estimate the profiles and the socio-economic characteristics of the population of French recreational fishers. Concerning the logbook study, a second questionnaire was filled out by a representative sample of 2 646 French recreational fishers. As the first questionnaire was filled out by a representative sample of the French population, quotas for fishing area, annual number of fishing trips and fishing techniques were implemented based on its results in order to specify an enlarge the sample of fishers. Increasing the number of responses from fishers strengthens the results for questions related to the activity. This larger sample includes fishers from the initial sample, fishers recruited via social networks, and fishers from recreational fishers' associations. The

results were adjusted for the percentage of respondents who are members of recreational fishers' associations.

- Panel survey : an online logbook has to be filled in by fishermen during 12 months in order to have an annual estimation of catches by species. Panelists are regularly contacted to make sure they have well filled in their logbook.

Sampling design and protocols

Sampling design description:

- Framing survey : In the screening survey, the quota sampling method is used to ensure sample representativeness. Quotas are based on census data published by INSEE and encompass age, sex, socio-professional category, education and region of residence. Respondents are selected from an online panel tool where hundreds of thousands of people are registered.
- Panel survey : Fishermen filling in online logbooks are volunteers and are recruited through the different ways already defined. Fishers with the most important level of avidity are not many. That is why, those who practice the most are overweighed in order to make the estimations of catches more precise. Data collected in the logbook are the date, the duration and the location of fishing session, the species collected, the size and the weight of catches, the destination of catches (kept or released) and the fishing gear. Concerning non responses, imputation method called hot deck (Sarndal et Lundstrom 2005) is used: with the help of panelists having the same characteristics, data of catches are reassessed on the basis of fishing trips declared. Catches declared by fishermen are compared with IFREMER campaigns (EVHOE) and if there is a doubt, fishers are contacted again to make sure it is correct. If data is unusable, they are removed from the analysis.

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

Regional coordination:
N

Link to sampling design documentation:
FranceAgriMer, 2021, internal report awaiting public publication.

Compliance to international recommendations:
Y
Although the methodology follows recommendations with screening and follow-up surveys, the use of an online panel and social media has been scarcely documented. The ICES – WGRFS recommendations were taken into account to pursue data collection. Further work will be carried out to improve data collection for future surveys.

Link to sampling protocol documentation:
FranceAgriMer, 2021, internal report awaiting public publication.

Compliance to international recommendations:
Y

Sampling implementation

Recording of refusal rate:

- Framing survey: N, documentation will not be available because refusal rate was not recorded.
- Panel survey : reporting rate and panel erosion will be followed up during the survey to ensure a minimum number of panellists reporting their catches.

Monitoring of sampling progress within the sampling year:

- Framing survey : NA – one-shot survey in 2021.
- Panel survey : Every month, data is collected from the panel survey and the FishFriender app., drop-out rates are registered and work is carried out to recruit new volunteers according to their profile. Moreover, panelists are rewarded with access to premium functionalities of the Fish-friender app, which should prevent panel erosion.

Data capture

Means of data capture:

- Framing survey : Data for the screening survey, is collected online with the online panel tool from the GECE institute, individuals answer a short questionnaire 3 min, for the additional questionnaire, volunteers are redirected to a 10 min online questionnaire.
- Panel survey : Data in the panel survey is collected through the FishFriender mobile/web application: https://www.fishfriender.com/?_locale=fr

Data capture documentation: In the FishFriender application used by the fishermen panelists, an automatic system of species recognition through photo of catches is integrated. Besides, an information letter is added to inform fishermen how to measure the catches.

Quality checks documentation:
Y. Pictures of the catch can be uploaded on the smartphone app, and species identification can be corrected.

Data storage

National database:
NA. Data is stored in excel sheets.

International database:
NA

Quality checks and data validation documentation:
If outliers are recorded (ex: unrealistic size of a catch), panelists are contacted to confirm the data entered in the application, if not corrected by the panelist, they are removed from the analysis.

Sample storage

Storage description: NA – no biological material is collected through this sampling scheme – only length and weight are sampled.

Sample analysis: NA

Data processing

Evaluation of data accuracy (bias and precision):
Y. Bias not evaluated, however results are compared to previous surveys. Precision estimated with the confidence interval.

Editing and imputation methods:
Rocklin et al., 2014. https://doi.org/10.1371/journal.pone.0087271.

Quality document associated to a dataset:
No quality document associated.

Validation of the final dataset:
Quality of the estimations is established by the width of the confidence interval, if the confidence interval is larger than the volume estimated, then the data is considered unsound.

Recreational (off site surveys) – CRFDCF

MS : FRA

Region: Mediterranean and Black Sea

Sampling scheme identifier: CRFDCF (Corsican Recreational Fisheries Data Collection Framework)

Sampling scheme type: recreational (off site surveys)

Observation type: SelfAtSea

Time period of validity: 2022-2024

Short description (max 100 words):

Self-sampling scheme (2022-24):

The methodology used for the recreational data collection aims to evaluate length and weight samples from each species captured and recorded in the catch logbooks returned by licensed recreational fishermen. All species listed in Table 1 of the EU MAP Delegated Decision annex captured will be collected (opportunistic collect) but the most caught species in this area are *Seriola dumerili and Dentex dentex*.

At-sea sampling scheme (one year in the period):

During NWP period (2022-2024), the RNBB's (natural reserve of the Strait of Bonifacio) manager is investigating the possibility of sampling at sea the total 80,000 ha of the RNBB for recreational fisheries in 2023 to expand the study area and the species sampled (Rowing surveys methodology used on the RNBB in 2010 to 2014).

Description of the population

Population targeted:

The natural reserve of the Strait of Bonifacio (RNBB) is managed by the Office of the Environment of Corsica (OEC). It is the biggest marine natural reserve of the north-western Mediterranean Sea (80 000 ha). Recreational fishing is regulated on the Natural Reserve since 1999 by ministerial decree. To this regulation is added since 2012 a prefectural order (Arrêté N°R20-2018-03-02-001 DU 02 MARS 2018) limiting the capture of the recreational fishing to a quota of 5kg/fisherman/day with an obligatory declaration of fishing delivered by the manager. In a 10 000 ha area classified as a reinforced protection zone, submarine hunting is prohibited and recreational fishing with a hook is limited to 400 fishermen per year. Each fisherman is obliged to submit a catch report in order to renew his authorization.

For the self-sampling, the primary sampling units are Fisherman*Trip. For each fishing trip carried out in reinforced protection zone (see green area in maps below), the fisherman records length and weight of the species caught. He also records, the fishing technique, the duration of the fishing trip and the location of the catches. Each authorized fisherman can make as many trips as he wishes during the year, provided he respects the limit of 5kg of fish per day and per fisherman applicable to the whole of the RNBB.

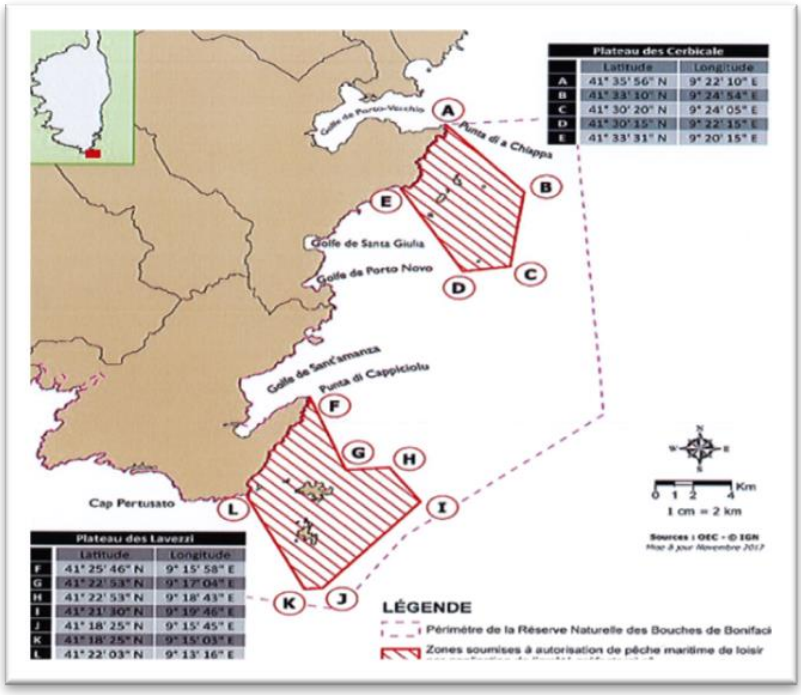
For the sampling at-sea, the primary sampling units are Fisherman*Trip. For each fishing trip carried out in the all RNBB area (see light blue area in maps below), the at-sea observer collects length and weight of all the species caught. He also records, the fishing technique, the duration of the fishing trip and the location of the catches (limit of 5kg of fish per day and per fisherman). Data of all samples realised alive or dead are collected at sea.

Population sampled:

For the self-sampling (10 000 ha – green area), only trips returned by authorized fishermen using their mandatory catch books are sampled. Trips with incomplete or unusable information are excluded (around of 1000 trips sampled in 2018)

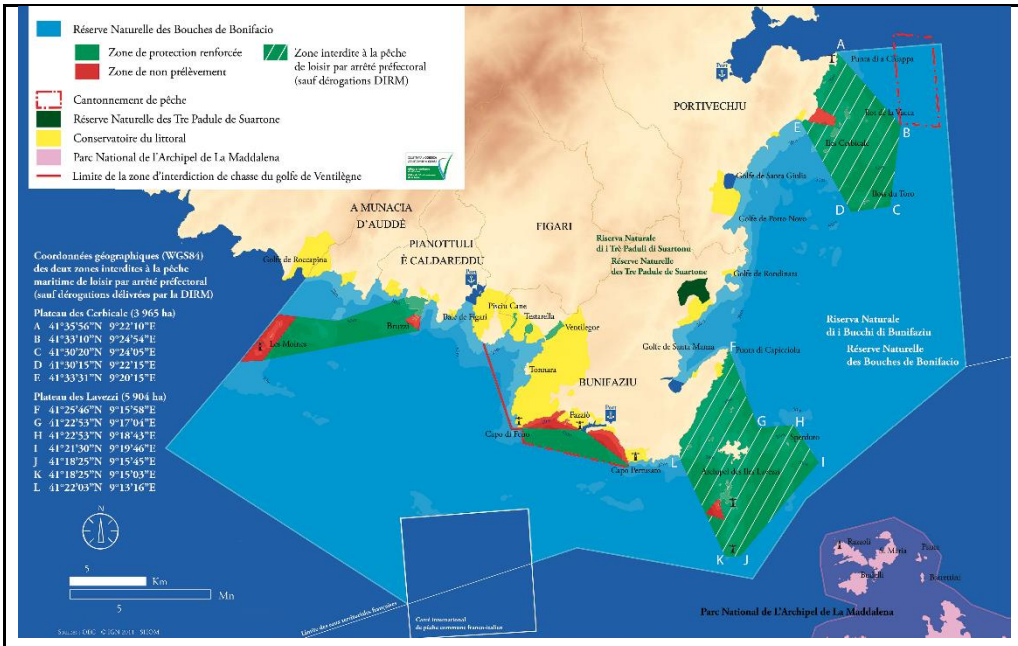
For the sampling at-sea (80 000 ha), data collection is carried out randomly over the entire RNBB, with the exception of no take areas. The at-sea observer goes to meet the recreational fishermen at sea to collect the data on the boat (rowing-surveys). The at-sea observer will join several times a month the surveillance and control missions carried out daily by the RNBB rangers. They go directly to meet the recreational fishermen in fishing action. At each control, the scientific observer will record the lengths and weights of the species caught (and associated fishing parameters).

Stratification:
For self-sampling at sea (10 000 ha – green area): There are two areas subject to authorization by prefectural decree: ABCDE zone (Cerbicale archipelago) and FGHIJKL zone (Lavezzi archipelago). The data will be grouped together to have only one geographical stratum and by month for the temporal stratum.



Map linked to the prefectural order regulating recreational fishing in the RNBB. Representation of the areas concerned by self-sampling.

For at-sea sampling (80 000 ha – light blue area): the data will be collected one 3 stratums (differentiating areas according to their protection status). For the Annual report the data will be grouped together to have only one geographical stratum (RNBB) and by month for the temporal stratum.



Map of natural reserve of Strait of Bonifacio.

Sampling design and protocols

Sampling design description:

For self-sampling sampling scheme: The sampling concerns the catches made by recreational fishermen with a fishing authorization for two specific areas of the RNBB. These authorizations are issued by the DIRM under the prefectural decree n ° R20-2018-03-02-001. In 2018 the OEC collected around of 1000 PSU (trips).

For sampling at sea by an observer (80 000 ha): Sampling is carried out on average 3 times a week depending on the weather. As the whole RNBB cannot be scaled in one day, the sampling of the sectors is carried out over the week. The sampling is carried out in an opportunistic way throughout the day of surveillance of the rangers of the natural reserve.

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

For self-sampling sampling scheme: N/A – mandatory reporting by recreative fishermen in the reinforced protection area.

For sampling at sea by an observer (80 000 ha) : Y – no random draw from a list, but recreational fishermen are met randomly during control trips.

Regional coordination:

No regional coordination.

Link to sampling design documentation:

Self-sampling:

http://www.dirm.mediterranee.developpement-durable.gouv.fr/reglementation-de-la-peche-maritime-de-loisir-dans-a2840.html

Sampling at-sea: Available upon request

Compliance with international recommendations:

Y

The CRF-DCF sampling plan and the data collected on Corsica respond to the Measures and sub-measures of the DCSMM monitoring programme as well as to the objectives and indicators of the Strategic Facade Document for France (DSF). The data collected on small-scale coastal fishing responds to the GFCM's Regional Action Plan for small-scale fishing in the Mediterranean and Black Sea (RPOA-SSF). This data collection is also integrated into the management plan of the Strait of Bonifacio nature reserve for the next 10 years.

Link to sampling protocol documentation:

Self-sampling scheme:

Recreational fishermen have to apply for an authorization to get permission to fish in restricted areas (https://www.oec.corsica/Mise-en-place-d-une-teledeclaration-pour-la-peche-maritime-de-loisir-dans-la-RNBB-Saison-2021_a2947.html).

Once their authorization has been obtained, they must fill in the length and / or weight of the catches in a catch book according to the model available in Annex 4 of the prefectoral order (http://www.dirm.mediterranee.developpement-durable.gouv.fr/IMG/pdf/arrete_reglementation_rnbb.pdf).

At sea sampling scheme:

The protocol will be available on www.oec.corsica.

Compliance with international recommendations:

Y (RCG Med& BS - recreative Fisheries in Mediterranean Sea)

Sampling implementation

Recording of refusal rate:

Yes, the proportion of book not returned is calculated for self-sampling. It is a non-response bias.

For sampling-at sea, the sampling is carried-out with the rangers. The control of the captures is obligatory within the context of the prefectural order on the RNBB, so recording of refusal rate for this scheme is irrelevant.

Monitoring of sampling progress within the sampling year:

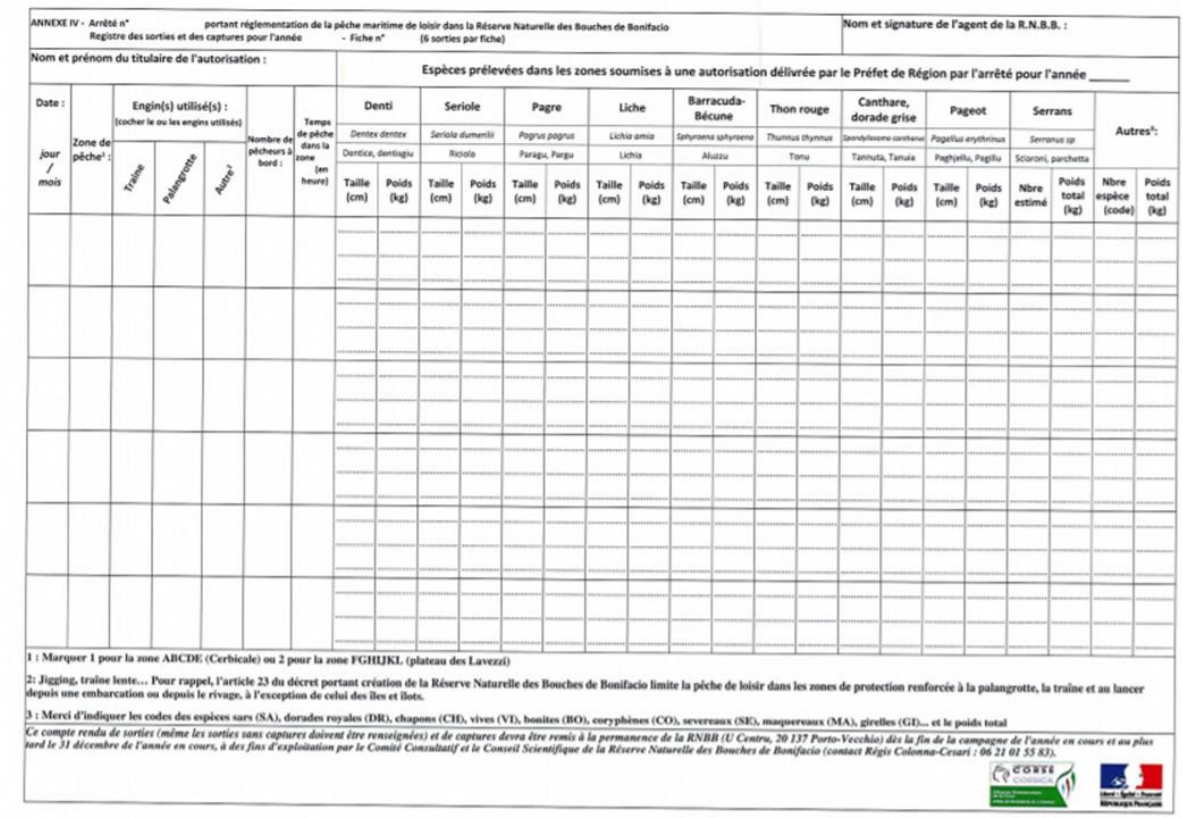
For self-sampling: N/A. There is no sampling adjustment in the sampling year. 400 authorizations are issued each year. The fishermen returning their books have priority the following year in order to have over the years a more important base of assiduous fishermen.

For sampling at sea: the sampling will follow up during the year (recreational data base) and will be adjusted if needed, in order to ensure that the different fishing technologies used in the RNBB are well represented.

Data capture

Means of data capture:

Length and weight are taken by recreational fishers themselves. the data are entered in a notebook in the format of Annex 4 of decree no. R20-2018-03-02-001 – length and weight per species must be recorded.



ANNEXE IV - Arrêté n° portant réglementation de la pêche maritime de loisir dans la Réserve Naturelle des Bouches de Bonifacio

Registre des sorties et des captures pour l'année - Fiche n° (6 sorties par fiche)

Nom et signature de l'agent de la R.N.B.B. :

Nom et prénom du titulaire de l'autorisation :

Espèces prélevées dans les zones soumises à une autorisation délivrée par le Préfet de Région par l'arrêté pour l'année _____

Date : jour / mois	Zone de pêche[1] :	Engin(s) utilisé(s) : (cocher le ou les engins utilisés) Traîne	Palangrotte	Autre[2]	Nombre de pêcheurs à bord :	Temps de pêche dans la zone (en heure)	Denti *Dentex dentex* Dentice, dentisgiu Taille (cm)	Denti Poids (kg)	Seriole *Seriola dumerili* Ricciola Taille (cm)	Seriole Poids (kg)	Pagre *Pagrus pagrus* Paragu, Pargu Taille (cm)	Pagre Poids (kg)	Liche *Lichia amia* Lichia Taille (cm)	Liche Poids (kg)	Barracuda-Bécune *Sphyraena sphyraena* Aluzzu Taille (cm)	Barracuda-Bécune Poids (kg)	Thon rouge *Thunnus thynnus* Tonu Taille (cm)	Thon rouge Poids (kg)	Canthare, dorade grise *Spondyliosoma cantharus* Tannuta, Tanuia Taille (cm)	Canthare, dorade grise Poids (kg)	Pageot *Pagellus erythrinus* Paghjellu, Pagiddu Taille (cm)	Pageot Poids (kg)	Serrans *Serranus sp* Sciaroni, parchetta Nbre estimé	Serrans Poids total (kg)	Autres[3] : Nbre espèce (code)	Autres[3] : Poids total (kg)

1 : Marquer 1 pour la zone ABCDE (Cerbicale) ou 2 pour la zone FGHIJKL (plateau des Lavezzi)

2: Jigging, traîne lente… Pour rappel, l'article 23 du décret portant création de la Réserve Naturelle des Bouches de Bonifacio limite la pêche de loisir dans les zones de protection renforcée à la palangrotte, la traîne et au lancer depuis une embarcation ou depuis le rivage, à l'exception de celui des îlen et îlots.

3 : Merci d'indiquer les codes des espèces sars (SA), dorades royales (DR), chapons (CH), vives (VI), bonites (BO), coryphènes (CO), severeaux (SE), maquereaux (MA), girelles (GI)... et le poids total

Ce compte rendu de sorties (même les sorties sans captures doivent être renseignées) et de captures devra être remis à la permanence de la RNBB (U Centru, 20 137 Porto-Vecchio) dès la fin de la campagne de l'année en cours et au plus tard le 31 décembre de l'année en cours, à des fins d'exploitation par le Comité Consultatif et le Conseil Scientifique de la Réserve Naturelle des Bouches de Bonifacio (contact Régis Colonna-Cesari : 06 21 01 55 83).

Data capture documentation:

http://www.dirm.mediterranee.developpement-durable.gouv.fr/IMG/pdf/arrete_reglementation_rnbb.pdf

https://www.oec.corsica/Declarations-de-peche-de-loisir-2021_a3932.html

https://www.facebook.com/ReserveNaturelleDesBouchesDeBonifacio/posts/2643125572467902

Marengo M., Culioli J.-M, Santoni M.-C, B Marchand and E.-D.-H Durieux (2015). Comparative analysis of artisanal and recreational fisheries for Dentex dentex in a Marine Protected Area. Fisheries Management and Ecology, 22 (3) 249-260.

Vesperini A, 2016. Vers une gestion de la ressource halieutique optimisée : analyse des informations issues de la pêche récréative et de la pêche artisanale dans la Réserve naturelle des Bouches de Bonifacio. Master 2 Gestion Intégrée du Littoral et des Ecosystème. Università di Corsica, 24.

Culioli JM, Santoni MC, 2017. Etat synthetique des connaissances sur la gestion de la resource halieutique dans les Bucchi di Bunifaziu. OEC, 16.

Quality checks documentation:

Y – The data returned by the recreational fishermen are verified by the RNBB agents who are in charge of entering data into the OEC database. They are compared to the length/weight relationships calculated by allometric coefficient and exclude outliers. A comparative analysis between the average length declared by species and the average length measured taken directly in the field by scientific staff during roving surveys is also carried out.

Data storage

National database:
NA (only RNBB is concerned) The at sea sampling and self-sampling data of recreational fishing are stored in a recreational database (Excel file). Each year the scientific team of the RNBB takes charge of the verification of the n-1 data and the input of the self-sampling paper forms in Excel format. This database is called "RNBB recreational data base". Over the period 2022-2024, the OEC will work on the implementation of an online data entry file for self-sampling data and on a more efficient database adapted to the response to European calls for data including self-sampling and at sea sampling data.

International database:
NA (only RNBB is concerned)

Quality checks and data validation documentation:
The data is verified by OEC staff. Incomplete, aberrant or unusable data are discarded.

Sample storage

Storage description:

NA. No biological samples collected. Only length and weight measurements collected at sea by roving survey and self-sampling by recreational fishermen.

Sample analysis:
NA. No biological samples collected. Only length and weight measurements collected at sea by roving survey and self-sampling by recreational fishermen.

Data processing

Evaluation of data accuracy (bias and precision):
Y. The various biases such as non-response biases, aberrant, incomplete or unusable data are identified by OEC staff.

Editing and imputation methods:
Marengo M., Culioli J.-M, Santoni M.-C, B Marchand and E.-D.-H Durieux (2015). Comparative analysis of artisanal and recreational fisheries for Dentex dentex in a Marine Protected Area. Fisheries Management and Ecology, 22 (3) 249-260.

Vesperini A, 2016. Vers une gestion de la ressource halieutique optimisée : analyse des informations issues de la pêche récréative et de la pêche artisanale dans la Réserve naturelle des Bouches de Bonifacio. Master 2 Gestion Intégrée du Littoral et des Ecosystème. Università di Corsica, 24.

Culioli JM, Santoni MC, 2017. Etat synthetique des connaissances sur la gestion de la resource halieutique dans les Bucchi di Bunifaziu. OEC, 16.

http://www.dirm.mediterranee.developpement-durable.gouv.fr/IMG/pdf/arrete_reglementation_rnbb.pdf
https://www.oec.corsica/Declarations-de-peche-de-loisir-2021_a3932.html
https://www.facebook.com/ReserveNaturelleDesBouchesDeBonifacio/posts/2643125572467902

Quality document associated to a dataset:
No quality document associated.

Validation of the final dataset:
The data is verified by OEC staff.

Recreational (off site surveys) – Mandatory reports of recreational catches of bluefin tuna

MS : FRA

Region: North-East Atlantic, Mediterranean and Black Sea

Sampling scheme identifier: Mandatory reports of recreational catches of bluefin tuna

Sampling scheme type: recreational (off site surveys)

Observation type: Self-sampling at sea

Time period of validity: 2022-2024

Short description (max 100 words):

This scheme uses data collected through mandatory forms that have to be filled by recreational fishermen when fishing Bluefin tuna in North East Atlantic and Mediterranean Sea (Corsica included). Data collected are : number of bluefin tuna caught, weight and length.

Description of the population

Population targeted:

This scheme targets all catches of bluefin tuna performed by all recreational fishermen fishing for Bluefin tuna in North East Atlantic and Mediterranean Sea (Corsica included). As this scheme is based on mandatory forms, this scheme is exhaustive, no sampling unit applies.

Population sampled:

The population sampled is all declared catches of bluefin tuna performed by recreational fishermen with a legal right to catch and retain bluefin tunas. Before fishing bluefin tuna, recreational fishermen must ask for a specie-specific licence, then, when catch occur, they must report their catch through a dedicated mandatory form. Undeclared fishing of Bluefin tuna is illegal and not estimated. The form includes data on weight and length.

Stratification:

NA – sampling is exhaustive as reporting is mandatory.

Sampling design and protocols

Sampling design description:

No selection applies as reporting is mandatory – sampling is supposed to be exhaustive (except for illegal undeclared catches).

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

NA

Regional coordination:

No regional coordination applies.

Link to sampling design documentation:

NA. No selection applies as reporting is mandatory – sampling is supposed to be exhaustive (except for illegal undeclared catches).

Compliance with international recommendations:
Y. This scheme is part of the multi-annual management plan for Bluefin tuna in Atlantic and Mediterranean Sea.

Link to sampling protocol documentation:
Recreational fishermen have to apply for an authorization in order to be permitted to catch bluefin tuna (https://www.legifrance.gouv.fr/jorf/id/JORFTEXT000043268606). They have to declare all retained catches through a specific form (https://www.formulaires.service-public.fr/gf/cerfa_14938.do), which includes length (cm – measurement should be done according to (CE) n° 520/2007) and weight (kg) of the animal. Measurements are done by recreational fishermen themselves – thus considered as self-sampling.

Compliance with international recommendations:
Y - length measurement are done according to (CE) n° 520/2007.

Sampling implementation

Recording of refusal rate:
NA. All undeclared catches of Bluefin tuna are illegal.

Monitoring of sampling progress within the sampling year:
NA. Scheme is exhaustive, so sampling progress is irrelevant.

Data capture

Means of data capture:
Length and weight are taken by recreational fishers themselves, through their own means.
One form should be filled per animal. Form is sent to FranceAgriMer within 48 hours after landing.

Data capture documentation:
See above. Form is available here : https://www.formulaires.service-public.fr/gf/cerfa_14938.do

Quality checks documentation:
Check for completeness of fishermen reports is performed by FranceAgriMer.

Data storage

National database:
Data are reported by FranceAgrimer in a excel file.

International database:
NA

Quality checks and data validation documentation:
Check for consistency is performed by FranceAgriMer.

Sample storage

Storage description:

NA. No biological sample taken.

Sample analysis:

NA. No biological sample taken.

Data processing

Evaluation of data accuracy (bias and precision):
N. No correction methods are put in place. All declared catches are summed.

Editing and imputation methods:
N. No imputation and editing methods put in place.

Quality document associated to a dataset:
NA. The number and total weight of declared bluefin tuna landings are available for scientific use.

Validation of the final dataset:
Dataset is transmitted to French Directorate of Fisheries and made available for scientific use.

Diadromous (recreational) – Mandatory reports recreational salmo salar

MS: FRA

Region: North-East Atlantic and North Sea and Eastern Arctic

Sampling scheme identifier : Mandatory reports recreational salmo salar

Sampling scheme type: Diadromous (recreational)

Observation type: SelfOnShore

Time period of validity: 2022-2024

Short description (max 100 words):

Monitoring of recreational salmon fishing in freshwater (French rivers) is based on mandatory reporting. The aim is to collect data on abundances, size, weight, age and sex of fish caught by anglers.

Description of the population

Population targeted:

2 regions are monitored, the other regions are not monitored because there are no salmon in the Mediterranean Sea.

All salmon caught in freshwater by anglers.

Population sampled:

Only the adult stage whose total length is greater than 0.50m (legal catch size - Articles R436-62 to R436-65) is monitored with recreational fishing. Except for the Adour basin, mandatory reporting is subject to year-class quotas for adult salmon.

Stratification:

Regulations concerning all catch declarations apply to all rivers where salmon fishing is permitted (see table 1 below). They may vary from one river to another. This makes it possible to obtain data on the majority of French rivers. This also means there is as many strata generated as there are rivers where regulations apply.

Sampling design and protocols

Sampling design description:

Recreational freshwater salmon fishing is subject to compliance with the Order of 16 October 1996 laying down special requirements. Freshwater fishing is regulated by opening and closing dates which rules the fishing season. These dates are updated each year. In addition, quotas are set for most rivers (except for Adour basin) and fishing is closed once the quota is getting close or above 80%, considering the fact that there are possibly non-declared catches (fraud or fish yet to be declared). Those quotas are also subject to changes from year to year considering the number of catches on the previous year. (See example for 2021 in table 1).

Table 1: Rivers authorised for salmon fishing, quotas, opening and closing dates in 2021

TOPONYME	TAC PHM nb SAT PHM	TAC global Nombre d'œufs	Taux de déclaration PHM (lorsqu'il a pu être estimé)	Taux de déclaration 1HM (lorsqu'il a pu être estimé)	Période d'ouverture (varie selon les parties des cours d'eau et les modalités de pêche autorisées (cf. Arrêtés préfectoraux))			
					Ouverture des PHM	Fermeture des PHM	Ouverture 1HM	Fermeture globale
CANCHE	0	18261			24-avr			31-oct
AUTHIE	0	18261			24-avr			31-oct
Artois-Picardie	**0**	**36522**						
BRESLE	2	18261			24-avr	09-juin		31-oct
ARQUES	2	26172			24-avr	09-juin		31-oct
Haute-Normandie	**4**	**44433**						
TOUQUES	2	25381			01-mai	09-juin		25-oct
ORNE	Pas de TAC						Pêche interdite	
VIRE	10	127642			01-mai	09-juin	11-juil.	25-oct
SAIRE	Pas de TAC						Pêche interdite	
SIENNE	52	689568			13-mars	09-juin	11-juil.	19-sept
SEE SELUNE	105	1236365			13-mars	09-juin	11-juil.	19-sept
Basse-Normandie	**169**	**2078956**						
Seine-Normandie	**173**	**2123389**						
COUESNON	10	191674			13-mars	09-juin	11-juil.	01-oct
GOUET	2	27745			13-mars			31-juil
LEFF	10	189439			13-mars	31-juil	01-sept	06-oct
TRIEUX	31	568530			13-mars	31-juil	01-sept	06-oct
JAUDY	8	137927			13-mars	31-juil	01-sept	06-oct
LEGUER	49	911447			13-mars	31-juil	01-sept	06-oct
YAR	Pas de TAC							
DOURON	15	281580			13-mars	15-juin	16-juin	15-oct
QUEFFLEUTH	22	416553			13-mars	15-juin	16-juin	15-oct
PENZE	35	657488			13-mars	15-juin	16-juin	15-oct
DOURDUFF	6	109141			13-mars	15-juin	16-juin	15-oct
JARLOT	13	240859			13-mars	15-juin	16-juin	15-oct
FLECHE	6	119203			13-mars	31-mai	01-juil	15-oct
ABER ILDUT	8	145614			13-mars	31-mai	01-juil	19-sept
ABER BENOIT	6	106626			13-mars	31-mai	01-juil	15-oct
ABER WRACH	7	136810			13-mars	31-mai	01-juil	15-oct
ELORN	50	932196			13-mars	15-juin	16-juin	15-oct
RIVIERE DAOULAS	13	230029			13-mars	15-juin	16-juin	31-juil
AULNE	13	240026			13-mars	15-juin	16-juin	15-oct
Bretagne Nord	**304**	**5642887**						
GOYEN	13	233173			13-mars	15-juin	16-juin	19-sept
ODET + AFFL	61	1125701			13-mars	31-mai	01-juil	19-sept
BELON	5	86503			13-mars	31-mai	01-juil	19-sept
AVEN	22	408082			13-mars	31-mai	01-juil	19-sept
ELLE + AFFL	121	2254624			13-mars	31-mai	01-juil	15-oct
SCORFF	42	776402			13-mars	31-mai	01-juil	19-sept
BLAVET	33	603586			13-mars	31-mai	01-juil	19-sept
PONT DU ROC'H	Pas de TAC							
KERGROIX	Pas de TAC							
LOCH	Pas de TAC							
Bretagne Sud	**297**	**5488071**						
Loire-Bretagne	**601**	**##########**						
GAVE OLORON	Pas de TAC				13-mars	31-juil	02-sept	15-sept
GAVE MAULEON					13-mars	31-juil	02-sept	15-sept
GAVES REUNIS							Pêche interdite	
GAVE PAU					13-mars	31-juil	02-sept	15-sept
NIVE					13-mars	31-juil	02-sept	15-sept
ADOUR								
NIVELLE					13-mars	31-juil	01-sept	15-oct
Adour-Garonne	Pas de TAC							

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

Regional coordination:
No regional coordination.

Link to sampling design documentation:
The management of the declarations is ensured by the National Centre for the Interpretation of Migratory Salmonid Catches (CNICS). Documentation is available on the CNICS webpage

Compliance to international recommendations:
Y - Working Group on North Atlantic Salmon (WGNAS)
Link to sampling protocol documentation:
Guide for online declaration of catches of migratory salmonids for the fisherman edited by the National Federation of Fishing in France.
Procedure for ageing: A guide for age estimation of salmon is currently being drafted and should be published in early 2022.
For genetic sexing the protocol will be published in 2022.

Sampling implementation

Recording of refusal rate:
Y
Estimations of catch declarations are made, when possible, by the OFB agents (template) and taken into account during the season and in the final balance sheets.

Monitoring of sampling progress within the sampling year:
Fishing quotas are set by river and sea age (except Adour), so it is possible that fishing is prohibited for a part of the season (see Table 1 above) and/or only for a specific population of fish (above 70cm length).

Data capture

Means of data capture:
Anglers have an online declaration tool. They collect scales themselves following a national guide that they can found on that same website they use for declaration.
The age determination is carried out by 3 experts within the framework of Colisa Biological Resources Center (https://doi.org/10.15454/D3ODJM).
The sex of the fish is obtained by PCR (*Polymerase Chain Reaction)*.

Data capture documentation:
CNICS web page

Quality checks documentation:
The measurements made by anglers can't be verified. Only a consistency check is made when the data are inserted into the database for the size and the weight. In case of inconsistency, the information is entered into the database with a "warning" of potential error.
The ageing of salmon is carried out from the scales. Competence checks are regularly carried out during intercalibration seminars (3 or 4 times a year) within the framework of Colisa Biological Resources Center (https://doi.org/10.15454/D3ODJM).
Molecular sexing is verified by adding known sexed fish to the analysis.

Data storage

National database:
After declaration to the national fishing federation, the catch data, excluding nominative data, are integrated into the "Capture" database. This database is not accessible online.
International database:
NA
Quality checks and data validation documentation:

Coherence checks are carried out in order to respect the national and international reference systems and to make the database interoperable.

Sample storage

Storage description:

Scales are stored in the INRAE-U3E unit. As soon as they are received, they are put in a pouch where information is recorded. One or two scales are stored in 1.5 ml microtubes filled with 99.9% ethanol to sex each individual. Biological samples is managed by the Colisa Biological Resource Centre (ISO9001 certified), which is responsible for samples from a large number of fish in France. The samples are described in an online catalogue https://colisa.fr/ and available on request (depending on rarity).

Sample analysis :
The age interpretation is carried out according to the method described by Baglinière et al (1985). A new guide for age estimation of salmon is currently being drafted and should be published in early 2022.
For genetic sexing the protocol will be published in 2022.

Data processing

Evaluation of data accuracy (bias and precision):
Estimations of catch declarations are made, when possible, by the OFB agents (template) and taken into account during the season and in the final balance sheets. These estimations are sent to the CNICS every 15 days during the MSW season, and then once a month for 1SW.

Editing and imputation methods:
Each declaration received is registered in the database then extracted in this Excel file where they are automatically sorted as 1SW or MSW depending on their size and/or date of catch. This file is updated multiple times per year as opening/closing dates and quotas are subject to regular changes. We share this file with OFB agents and other partners.

Quality document associated to a dataset:
No DOI
Gestion du CNICS

Validation of the final dataset:
At the end of the year final report is sent to all OFB agent involved to check with them on the concordance of the reported catches numbers in each river.

Diadromous (commercial) – Mandatory reports commercial salmo salar and salmo trutta

MS: FRA
Region: North-East Atlantic
Sampling scheme identifier : Mandatory reports commercial salmo salar and salmo trutta
Sampling scheme type: Diadromous (commercial)
Observation type: SelfOnShore
Time period of validity: 2022-2024
Short description (max 100 words): Monitoring of professional salmon and sea trout catches in freshwater is based on mandatory reporting. The aim is to collect data on the size, weight, age and sex of fish caught by anglers.
Description of the population
Population targeted: All salmon and sea trout caught in freshwater by professional fisheries. **Population sampled:** Only the adult stage is monitored with professional fishing. Only the Adour river is used by professional freshwater fishermen for salmon and sea trout. **Stratification:** Only the Adour river is used by professional freshwater fishermen for adult salmon and sea trout.
Sampling design and protocols
Sampling design description: Commercial freshwater salmon fishing is subject to compliance with the management plan defined in the Adour PLAGEPOMI. It is regulated by opening and closing dates that govern the fishing season (March to July). The exact dates are updated every year Professional fishermen must hold a licence issued by the Comité National des Pêches Maritimes et des Élevages Marins (CNPMEM) and are obliged to declare all their catches of salmon and sea trout. With the declarations, scales are sent in the majority of cases. All those scales are read to determine fish's life history and a PCR (*Polymerase Chain Reaction)* is used for precise sexing. **Is the sampling design compliant with the 4S principle?:** NA – mandatory reports **Regional coordination:** No regional coordination **Link to sampling design documentation:** The management of the declarations is ensured by the National Centre for the Interpretation of Migratory Salmonid Catches (CNICS). Documentation is available on the CNICS webpage **Compliance to international recommendations:** Y, Working Group on North Atlantic Salmon (WGNAS) **Link to sampling protocol documentation:** Documentation is available on the CNICS webpage
Sampling implementation

Recording of refusal rate:
N

Monitoring of sampling progress within the sampling year:
Declaration and samples are sent by the fishermen every month.

Data capture

Means of data capture:
The fishermen measure and weigh their catches with their own equipment (scale and balance). They take a few scales and insert them in the paper declaration provided to them on which they have indicated the characteristics of the fish. They then send the declaration with the scales to the Centre National d'Interpretation des Captures de Salmonidés (CNICS).
The sex of the fish is obtained by PCR (*Polymerase Chain Reaction)*.

Data capture documentation:
Documentation is available on the CNICS webpage
Procedure for ageing: We have produced a guide (Bagliniere et al 2020) to age estimation for trout. The same guide for salmon is currently being drafted and should be published in 2022.
For genetic sexing the protocol will be published in 2022.

Quality checks documentation:
The measurements made by professionals can't be verified on field. Only a consistency check is made when the data are inserted into the database for the size and the weight. In case of inconsistency, the information is entered into the database with a "warning" of potential error.
The ageing of salmon is carried out from the scales. Competence checks are regularly carried out during intercalibration seminars (3 or 4 times a year) within the framework of Colisa Biological Resources Center (https://doi.org/10.15454/D3ODJM).
Molecular sexing is verified by adding known sexed fish to the analysis.

Data storage

National database:
For professional fishermen, data are entered from paper declarations in the national database "Capture". This database is not freely accessible. Requests for data must be addressed to the CNICS.
International database:
NA

Quality checks and data validation documentation:
Coherence checks are carried out in order to respect the national and international reference systems and to make the database interoperable.

Sample storage

Storage description:

Scales are stored in the INRAE-U3E unit. As soon as they are received, they are put in a pouch where information is recorded. Samples are managed by the Colisa Biological Resource Centre (ISO9001

certified), which is responsible for samples from a large number of fish in France. The samples are described in an online catalogue https://colisa.fr/ and available on request (depending on rarity).

Sample analysis :
The age interpretation for sea trout is carried out according to the method described by Baglinière et al (1985). A new guide for age estimation of salmon is currently being drafted and should be published in early 2022.
For genetic sexing the protocol will be published in 2022.

Data processing

Evaluation of data accuracy (bias and precision):
Controls have been done over the past years regarding declaration rates of profesionnal fisheries. Quality control of declarations by Relais Adour SNPE indicates that we have an approximate declaration rate of 99% to 100%.
Editing and imputation methods:
No documentation available yet. Documentation will be available in 2022
Quality document associated to a dataset:
No DOI
Documentation will be available in 2022
Validation of the final dataset: At the end of the year final report are sent to all OFB agent involved to check with them on the concordance of the reported catches numbers.

Biological parameters specific – Sea trout sampling purchase

MS: FRA

Region: North-East Atlantic

Sampling scheme identifier : Sea trout sampling purchase

Sampling scheme type: Biological parameters specific

Observation type: SciObsOnShore

Time period of validity: 2022-2024

Short description (max 100 words):

Sampling scheme aiming at collecting biological samples from estuary and marine commercial landings for sea trout (size, weight, age). The scheme cover only Saint Jean de Luz auction.

Description of the population

Population targeted:

Adult sea trout caught in estuaries or on the coast by professional fishermen.

Population sampled:

The sampled population corresponds to the individuals observed in the St Jean de Luz fish auction because it represents 99% of the tonnages of sea trout caught by professional fishermen.

Stratification:

A single geographical lot corresponding to the south-west region where fishermen have applied for a diadromous catch licence.

Sampling design and protocols

Sampling design description:

- Visits to the auction once or twice a week to take measurements and samples of the fish in the auction.
- Measurements: size (total length) and weight
- Sampling of about fifteen scales. These operations will be carried out in accordance with the protocols in force, as transmitted by INRAE.

Sampling plan number of trips per week

Weeks n° 9-12	Weeks n° 13-30	Total number of outputs
1	2	40

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

N

Regional coordination:

N

Link to sampling design documentation:

New monitoring, there is no dedicated documentation for the moment, it is planned for 2022.

Compliance to international recommendations:

N

New monitoring, there is no request from end users.

Link to sampling protocol documentation:

Documentation will be available in 2023

Sampling implementation

Recording of refusal rate:

Y

Monitoring of sampling progress within the sampling year:

As the period of this NWP corresponds to the first years of collection, we may have to adjust the sampling.

Data capture

Means of data capture:

Fish are measured to an accuracy of 1 cm and weighed to an accuracy of 1 gram. About 15 scales are taken for age interpretation and sexing. Information on the origin of the fish (fishing area or batch, date of capture) and on the measurements taken are recorded in a file provided by INRAE to the service provider.

The age determination is carried out by 3 experts within the framework of Colisa Biological Resources Center (https://doi.org/10.15454/D3ODJM).

The sex of the fish is obtained by PCR (*Polymerase Chain Reaction)*.

Data capture documentation:

New monitoring, there is no dedicated documentation for the moment, it is planned for 2022.

Quality checks documentation:

Y

Procedure for measuring (size, weight) and collecting scales.

Procedure for ageing: We have produced a guide (Bagliniere et al 2020) to age estimation for trout.

For genetic sexing the protocol is being published.

Data storage

National database:

The data are integrated from the template file provided to the provider into the national database "Capture". This database is not freely accessible, only on request.

International database:

NA

Quality checks and data validation documentation

Coherence checks are carried out in order to respect the national and international reference systems and to make the database interoperable.

The ageing of salmon is carried out from the scales. Competence checks are regularly carried out during intercalibration seminars (3 or 4 times a year) within the framework of Colisa Biological Resources Center.

Molecular sexing is verified by adding known sexed fish to the analysis.

Sample storage

Storage description: The scales are packaged with the material and according to the protocol provided by INRAE and sent to Rennes under the conditions specified by INRAE (periodicity and packaging) accompanied by the relevant file.

Scales are stored in the INRAE-U3E unit and managed by the Colisa Biological Resource Centre (ISO9001 certified), which is responsible for samples from a large number of fish in France. The samples are described in an online catalogue https://colisa.fr/ and available on request (depending on rarity).

Sample analysis :

The age interpretation is carried out according to the method described by Bagliniere et al 2020. For genetic sexing the protocol will be published in 2022.
Data processing
Evaluation of data accuracy (bias and precision): This sampling scheme will be carried out for the first time in 2022. The results obtained and any problems encountered will make it possible to respond in 2023 **Editing and imputation methods:** N documentation will be available in 2023 **Quality document associated to a dataset:** Documentation will be available in 2023 **Validation of the final dataset:** New sampling scheme, no data collected yet.

Diadromous (scientific) – Salmon and sea trout scientific surveys

MS: FRA
Region: North-East Atlantic and North Sea and Eastern Arctic
Sampling scheme identifier : Salmon and sea trout scientific surveys
Sampling scheme type: Diadromous (scientific)
Observation type: SciObs water body
Time period of validity: 2022-2024
Short description (max 100 words): The sampling plan for salmon and sea trout in freshwater is based on the scientific monitoring carried out within the framework of the Environmental Research Observatory on diadromous fish in coastal rivers (ORE DiaPFC) on rivers on the Atlantic and Channel coast. Its objective is to collect data on abundance, size, weight, age and sex ratio at different life stage (parr, smolt and adult).
Description of the population
Population targeted: 2 regions are monitored, the other regions are not monitored because there are no salmon and sea trout in the Mediterranean. Survey on salmon and sea trout (river*stage*day) **Population sampled:** Trap: For each river, daily monitoring of salmon and sea trout catches during the entire migration period. This period may vary from one river to another. Only on the Nivelle river, the monitoring of smolts is not carried out because the configuration of the control station for migratory fish does not allow the installation of a downstream trap. Electrofishing: On each river, a network of stations spread over the catchment area is monitored each year in September-October. The Scorff is not an index river for sea trout and therefore does not appear in this work plan. **Stratification:** For salmon, these are the 4 ICES salmon index rivers, the Bresle (Normandy, Seine-Maritime), the Oir (Normandy, Manche), the Scorff (Brittany, Morbihan) and the Nivelle (Nouvelle-Aquitaine, Pyrénées-Atlantiques). For sea trout, these are the 2 index rivers proposed by WGTRUTTA, the Bresle (Normandy, Seine-Maritime), the Oir (Normandy, Manche). The Nivelle (Nouvelle-Aquitaine, Pyrénées-Atlantiques_) should become an index river soon.

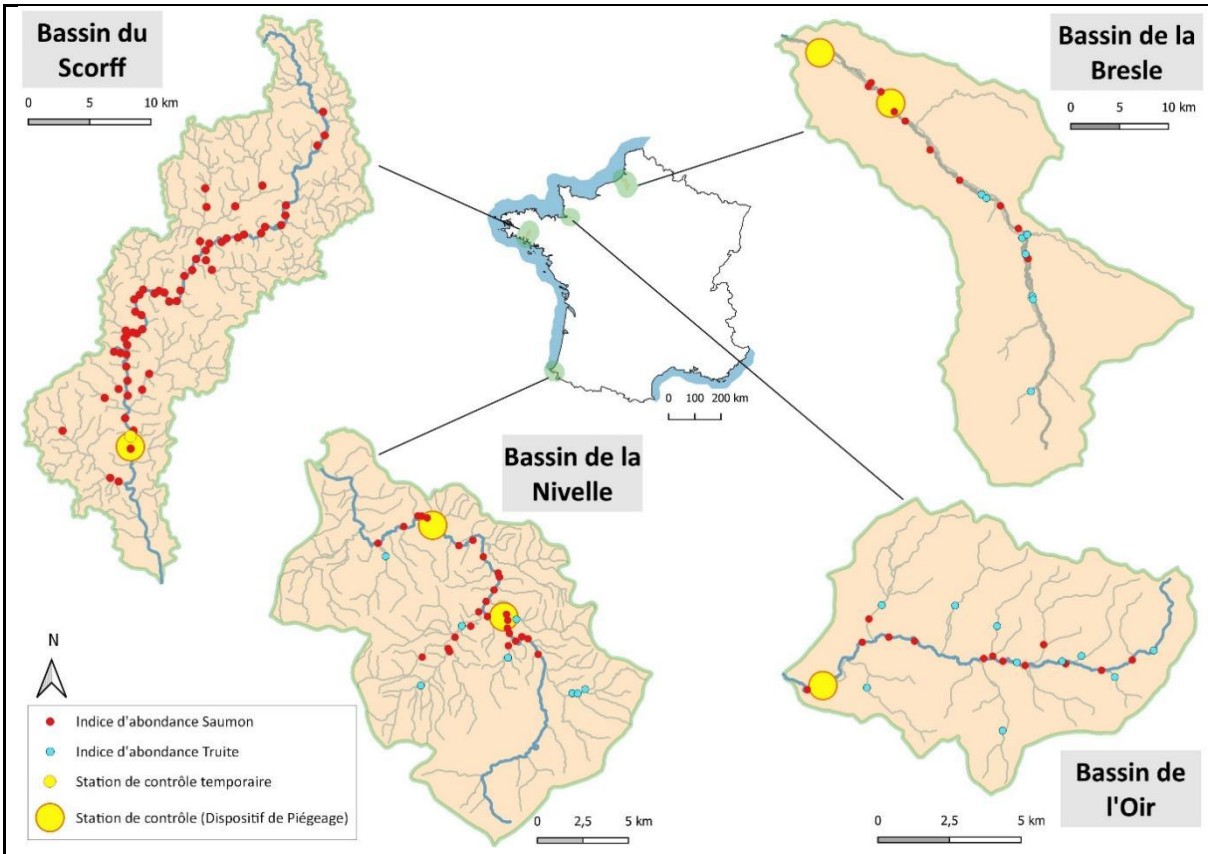


Figure 7 Location of diadromous fish monitoring sites and stations

Sampling design and protocols

Sampling design description:

Smolts and adults of both species are monitored by trapping (except on the Nivelle where the current configuration does not allow the installation of a descent trap). The period and number of days of trapping per river is adapted to the phenology of these species and to cover period of migration.

Monitoring of the juvenile stage (parr) is carried out by electrofishing. The stations are spread over the entire catchment area (Figure 1). For salmon, most of the effort is made on the main river. Apart from the Bresle, trout are monitored more particularly on the tributaries

Site	Number of stations sampled per year	
	Salmon	Trout
Bresle	10	8
Oir	13	10
Scorff	52	NA (no sea trout population)
Nivelle	22	10

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

NA – scientific survey.

Regional coordination:

No regional coordination.

Link to sampling design documentation:
Salmon and sea trout scientific surveys.pdf
Compliance to international recommendations:
Y - ICES index river for salmon and sea trout except for the moment for sea trout on the Nivelle.

Link to sampling protocol documentation:
Research Observatory on Diadromous Fish in Coastal Streams (ERO DiaPFC) web :
Procedure for salmon abundance indices
Procedure for trout abundance indices ®Vigitruite
Procedure for ageing: We have produced a guide (Bagliniere et al 2020) to age estimation for trout. The same guide for salmon should be published in early 2022.
For genetic sexing the protocol will be published in 2022.

Sampling implementation

Recording of refusal rate:
NA – scientific survey.

Monitoring of sampling progress within the sampling year:
Sampling frame is not adjusted on data collected within the sampling year. Continuous monitoring for trapping, depends on the biological rhythm and phenology of the species.

Data capture

Means of data capture:
Once the fish have been caught, measurements are taken using a measuring board and scales connected to a software program that allows the acquisition of measurement data, tagging and the input of additional information. The sex of the fish is obtained by observation during the reproduction period, as the morphological characteristics leave no doubt at this time. Outside this period, sexing is carried out by PCR (*Polymerase Chain Reaction).*

Data capture documentation:
Salmon and sea trout scientific surveys.pdf
Research Observatory on Diadromous Fish in Coastal Streams (ERO DiaPFC) web.

Quality checks documentation:
Salmon and sea trout scientific surveys.pdf
During the capture, a consistency check of the data entered is performed automatically. If they are not in the range >1 and <99%, a warning message appears but does not prohibit the capture. The verification is carried out on the size, the weight, the condition coefficient, all by species and by stage.
Weekly verification of scales by weighing known working masses (mass versus weight of target species). The ageing of salmon or trout is carried out from the scales. Competence checks are regularly carried out during intercalibration seminars (3 or 4 times a year) within the framework of Colisa Biological Resources Center (https://doi.org/10.15454/D3ODJM).
Molecular sexing is controlled by adding known sexed fish to the analysis.

Data storage

National database:

Database “Poissons”. This database is not accessible online.

International database:

Much of the data is available in the Global Biodiversity Information Facility (GBIF) database.

Quality checks and data validation documentation:

A web interface allows the integration in the database ‘Poissons’. On this occasion, coherence checks are again carried out in order to respect the national and international reference systems and to make the database interoperable. It also allows to avoid duplicate samples.

Sample storage

Storage description:

Scales are stored in a pouch where information is recorded. Tissues used for genetics (except scales) are stored in 1.5 ml microtubes filled with 99.9% ethanol. Biological samples are managed at the sites where they were collected.

The entire process is managed by the Colisa Biological Resource Centre (ISO9001 certified), which is responsible for samples from a large number of fish in France. The samples are described in an online catalogue https://colisa.fr/ and available on request (depending on rarity).

Sample analysis:

Guide (Bagliniere et al 2020) to age estimation for trout. The same guide for salmon should be published in early 2022.

For genetic sexing the protocol will be published in 2022.

Data processing

Evaluation of data accuracy (bias and precision):

Documentation is available on the ERO DiaPFC github for salmon.

The documentation is to be put in place for sea trout in 2023.

Editing and imputation methods:

Documentation is available on the ERO DiaPFC github for salmon.

The documentation is to be put in place for sea trout in 2023.

Quality document associated to a dataset:

Phenology and biological traits of migrating salmon (Salmo salar) sampled by trapping on GBIF: Oir, Scorff and Nivelle. The same dataset will be published soon for salmon on the Bresle and for sea trout on all sites.

Abundances and biological traits of the juveniles salmon published on GBIF, Oir, Scorff, Bresle and Nivelle. The publication of the trout datasets will be finalised by the end of 2022.

Estimation process documentation is available on the ERO DiaPFC github for salmon.

Validation of the final dataset:

Documentation is available on the ERO DiaPFC github for salmon.

The documentation is to be put in place for sea trout in 2023.

Diadromous (commercial) – Eel sampling purchase

MS : France

Region: All regions

Sampling scheme identifier: eel sampling purchase

Sampling scheme type: Diadromous (commercial)

Observation type: SciObsOnShore

Time period of validity: 2022-2023

Short description (max 100 words):

"Eel sampling purchase" sampling scheme is aiming at collecting biological samples from marine and freshwater commercial landings for glass eel (size, weight and pigment stage) and from freshwater commercial landings for yellow and silver eel (size, weight, age, eye diameter, sexe when possible). The scheme covers all the regions where commercial landings took place. Sampling will take place after 2023 but the sampling plan may change as tests are still underway for the sampling frequency.

Description of the population

Population targeted:

For glass eel: all marine and freshwater commercial fishermen targeting glass eel by EMU during fishing season (EMU*fishermen)

For yellow and silver eel: all freshwater commercial fishermen targeting yellow and/or silver eel by EMU during fishing season (EMU*fishermen)

Population sampled:

For glass eel: all vessels targeting glass eel in the EMU: Artois-Picardie, Seine-Normandie, Bretagne, Loire et Côtiers vendéens, Garonne-Dordonne-Charente-Seudre, Adour. Glass eel fishing is not allowed in the EMU Rhone Méditerranée Corse. There are no more commercial fisheries on the EMU Rhin and Meuse so it was decided to stop sampling these areas.

For yellow eel: All freshwater vessels targeting yellow eels in the EMU: Loire et Côtiers vendéens, Garonne-Dordonne-Charente-Seudre, Adour. Too few freshwater fishermen target yellow and/or silver eels in the EMU Rhine, Meuse, Artois-Picardie, Seine-Normandie, Bretagne, Rhone-Méditerranée-Corse for perennial sampling to be implemented.

For silver eel: All freshwater vessels targeting silver eels in the EMU Loire et Côtiers vendéens

Stratification:

For glass eel: Population stratified in 6 geographical lots (EMU). Each lot represents an eel management unit in which there is a quota and a specific fishing season. Each lot is then stratified by river, area (freshwater and marine water) and period of the fishing session.

For yellow eel: Population stratified in 3 geographical lots (EMU). Each lot represents an eel management unit in which there is a specific fishing season and period of the fishing session.

For silver eel: Only one geographical lot is sampled (EMU Loire et Côtiers vendéens). This lot is then stratified by period of fishing season

Sampling design and protocols

Sampling design description:

Sampling effort is proportional to the commercial landings in each EMU and is spread over the whole fishing season. Vessels are randomly drawn in a list by EMU. The sampling design for the glass eel monitoring is presented in the following table :

EMU	River	Type of fisherman	Beginning of the season	End of the season	date of first collection	date of second collection	date of third collection	nb
Artois-Picardie	Somme	marine	10-jan	25-may	15-feb	15-mar	15-apr	150
Seine-Normandie	Côtiers normands	marine	10-jan	25-may	15-feb	15-mar	15-apr	150
Bretagne	Vilaine	marine	01-dec	30-apr	20- dec	15-févr	30-mar	150
Loire	Loire	marine	01-dec	30-apr	20- dec	15-febr	30-mar	150
Loire	Loire	freshwater	01-dec	30-apr	20- dec	15-febr	30-mar	150
Loire	Côtiers vendéens	marine	01-dec	30-apr	20- dec	15- febr	30-mar	150
Garonne	Garonne	marine	15-nov	15-apr	10- dec	15-janv	01-mar	150
Garonne	Garonne	freshwater	15-nov	15-apr	15- dec	01- febr	15-mar	150
Garonne	Charente	freshwater	15-nov	15-apr	15- dec	01- febr	15-mar	150
Garonne	Charente	marine	15-nov	15-apr	10- dec	15-jan	01-mar	150
Adour	Adour	marine	01-nov	31-mar	20-nov	01-jan	01-mar	150
Adour	Adour	freshwater	01-nov	31-mar	01- dec	01-jan	01-mar	150
Adour	côtiers landais	freshwater	01-nov	31-mar	01- dec	01-jan	01-mar	150

The sampling design for the yellow and silver eel monitoring is presented in the following table:

EMU	Stage	Nb April-May	Nb June-July	Nb August-September	Nb October-November	Nb December-January-February	total
Loire	Yellow	55	65	65	65	0	250
Loire	Silver	0	0	0	25	25	50

Garonne	Yellow	50	75	75	0	0	200
Adour	Yellow	40	40	20	0	0	100

Is the sampling design compliant with the 4S principle?: NA
Regional coordination: No regional coordination.

Link to sampling design documentation:
For the glass eel, the protocol consists of collecting 50 individuals per area (sampling/purchase) three times during the fishing season (so 150 individuals per year per strata). The Rivers were chosen according to the distribution of known catches to be the best representatives of the fishery. See the table above for more details.
For the yellow and silver eel, the protocol consists of collecting yellow and silver eels (sampling/purchase) during all the fishing season in all the EMU where there are professional river fishermen. The following table shows the sampling plan.

Compliance to international recommendations: N

Link to sampling protocol documentation:
For glass eel:
The service provider collects the glass eels from the fishermen the same day as the fishing. They are then euthanized and for each individual the size, weight and pigment stage are recorded according to a defined protocol. The glass eels are then individually banked in a bank of biological samples of the INRAE to allow future analyses.
The protocol (Bardonnet A., Coste-Heinricj P. & Bolliet V., 2020, internal report) can be transmitted on request.
For yellow and silver eel:
The service provider collects the eels from the fishermen the same day as the fishing. They are then euthanized and for each individual the size, weight and eye diameter are recorded according to a defined protocol (Beaulaton L. & Pénil C., 2009, internal report). The individuals are then dissected to remove the otoliths (which will allow ageing) and to determine the sex for the individuals between 30 and 45 cm. The otoliths were send to expert from Ifremer and the age is determined by a protocol made by Ifremer (Dussuel and al., 2021, internal report)

Compliance to international recommendations: N

Sampling implementation

Recording of refusal rate: Y

Monitoring of sampling progress within the sampling year:
For glass eel: Each week, a review is carried out with the ministries to assess whether the quotas have been reached. Feedback is then given to the service providers to bring forward the collections when the quota is close to being reached. Providers are in contact with several fishermen per EMU to manage quota hits and meet the dates provided.

For yellow and silver eel: Regular telephone meetings are held with the service provider to check the progress of the collection. The service provider is in contact with several fishermen in order to ensure the collection.

Data capture

Means of data capture:

For glass eel:

- Precision scale to the mg
- binocular magnifying glass for the pigmentary stages.
- agents with experience in determination of elver pigmentary stage or with training.
- freezers (-20°C) allowing the storage of glass eels until they are sent
- benzocaine for euthanasia
- a standard excel file to fill in with the measurements

For yellow and silver eel:

- Precision scales to the g
- calipers for eye diameter,
- Ichtyometer (or meter) to the cm
- a standard excel file to fill in with the measurements

Data capture documentation:

For glass eel: The protocol (Bardonnet A., Coste-Heinricj P. & Bolliet V., 2020, internal report) can be transmitted upon request

For yellow and silver eel: The protocols (Beaulaton L. & Pénil C., 2009, internal report and Dussuel and al., 2021, internal report can be transmitted upon request

Quality checks documentation:

No documentation available yet, a documentation will be available in 2024

Data storage

National database:

National postgreSQL database: db_captures_marins_amphihalins

International database:

NA

Quality checks and data validation documentation:

Referential tables have been created and foreign keys linked to these tables have been created to avoid inconsistent data entry

Sample storage

Storage description:

For glass eels: whole individuals are kept in the freezer in individual numbered bags in the St Pée sur Nivelle INRAE lab. It is expected that the samples will be managed by the Colisa Biological Resource Centre (ISO9001 certified), which is responsible for samples from a large number of fish in France. The samples will then be described in an online catalogue https://colisa.fr/and available on request (depending on rarity).

For yellow and silver eel: All the otoliths are kept in the Boulogne sur Mer Ifremer lab. Each pair of otoliths is associated with biological data (size, weight, sex, etc.) and catch data (location, date, etc.) provided by the collectors. The experts of the Sclerochronology Unit will add an image reference, the estimated age and the preparation method. This will allow the name of the expert, the associated annotations and inter-ring measurements to be retrieved if necessary. All these data are currently managed in the national database for archiving and management of calcified developed by IFREMER under WinDev. The slides as well as the second otoliths of eels are stored in boxes of 100 slides in an archive room dedicated to Sclerochronology for an indefinite period.

Sample analysis:
For glass eel: The protocol (Bardonnet A., Coste-Heinricj P. & Bolliet V., 2020, internal report) can be transmitted upon request
For yellow and silver eel: The protocols Beaulaton L. & Pénil C., 2009, and Dussuel and al., 2021, internal report can be transmitted upon request

Data processing

Evaluation of data accuracy (bias and precision):
NA. Raw data sent to end-user upon request.

Editing and imputation methods:
NA. Raw data sent to end-user upon request.

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:
N because the data is not currently requested by end user.

Diadromous (scientific) – Eel scientific surveys

MS : France

Region: All regions

Sampling scheme identifier: eel scientifc surveys

Sampling scheme type: Diadromous (scientific)

Observation type: SciObsOnShore

Time period of validity: 2022-2026

Short description (max 100 words):

Sampling scheme aiming at estimating abundance indicators by river and collecting biological information (size, weight and stages) thanks to scientific electrofishing surveys and migration control stations. It was constructed within the French eel management plan (EMP). The scheme covers all the EMU except the Corse EMU.

Description of the population

Population targeted:

Survey of yellow eels (stock in place) (station*year) by electrofishing and survey of recruits and silver eels (migrating stages) thanks to the migration control stations in different French rivers.

Population sampled:

Recruits: glass eel and yellow eel (recruits) are sampled in 9 rivers in France in the EMU: Rhin-Meuse, Artois-Picardie, Seine-Normandie, Bretagne, Loire, Garonne-Dordogne, Adour and Rhone-Mediterranée

Yellow eels: yellow eels (stock in place) are sampled in 9 rivers in France in the EMU: Artois-Picardie, Seine-Normandie, Bretagne, Loire, Garonne-Dordogne and Adour

Silver eels: silver eel (adults) are sampled in 6 rivers in France in the EMU: Artois-Picardie, Seine-Normandie, Bretagne, Loire, Garonne-Dordogne, Adour

Stratification:

Population stratified into stages*Index rivers*year. The sampled rivers are the one selected in the French EMP as index river (see sampling design below)

Sampling design and protocols

Sampling design description:

For recruits: The surveys are done every year during the months when the fish migrations take place. The sampling design is presented in the following table

EMU	River	stage	times	Method
Rhin-Meuse	**Rhin**	**Yellow eel**	**12 months**	**Counter**
Artois-Picardie	**Somme**	**Yellow eel**	**8 months**	**Trap**
Seine-Normandie	**Bresle**	**Yellow eel**	**6 months**	**Trap**
Bretagne	**Frémur**	**Yellow eel**	**12 months**	**Trap**

Bretagne	**Vilaine**	**Yellow eel**	**12 months**	**Trap**
Bretagne	**Vilaine**	**Glass eel**	**12 months**	**Trap**
Loire	**Sèvre niortaise**	**Glass eel**	**4 months**	**Trap**
Garonne-Dordogne	**Dronne**	**Yellow eel**	**6 months**	**counter**
Garonne-Dordogne	**Dronne**	**Yellow eel**	**5 nights**	**Trap**
Adour	**Soustons**	**Yellow eel**	**12 months**	**Trap**
Rhône-Méditerranée	**Rhône**	**Glass eel**	**7 months**	**Trap**
Rhône-Méditerranée	**Rhône**	**Yellow eel**	**8 months**	**Trap**

For yellow eel: Several stations are sampled by year, the number of stations per river is defined according to the size of the river and the diversity of habitats. The sampling design is presented in the following table

EMU	River	Nb of stations	Type of survey
Seine-Normandie	Bresle	10	annual
Artois-Picardie	Somme	50	3 year electrofishing alternated sampling network
Seine-Normandie	Seine	30	Annual
Bretagne	Fremur	35	Annual
Bretagne	Vilaine	20	Annual
Loire, Côtiers vendéens et Sèvre niortaise	Sèvre Niortaise	30	Annual
Garonne-Dordogne-Charente-Seudre	Garonne	60	2 year electrofishing alternated sampling network
Adour	Adour	45	3 year electrofishing alternated sampling network
Adour	Soustons	11	Annual

For silver eel: The surveys are done every year during the months when the fish migrations take place. The sampling design is presented in the following table

EMU	River	times	Method
Artois-Picardie	**Somme**	**40 nights**	**Trap**
Seine-Normandie	**Bresle**	**6 months**	**Trap**
Bretagne	**Vilaine**	**8 months**	**Sonar**
Loire, Côtiers vendéens et Sèvre niortaise	**Sèvre niortaise**	**2 months**	**Trap**

Garonne-Dordogne-Charente-Seudre	**Dronne**	**30 nights**	**Trap**
Adour	**Soustons**	**80 nights**	**Trap**

Is the sampling design compliant with the 4S principle?: NA (scientific surveys)

Regional coordination: No regional coordination

Link to sampling design documentation:
https://professionnels.ofb.fr/sites/default/files/pdf/RapportPGA2018.pdf
see p. 8-13

Compliance to international recommendations: N

Link to sampling protocol documentation:
For scientific electrofishing sampling (yellow eel):
https://professionnels.ofb.fr/sites/default/files/pdf/guide_de_peches_a_lelectricite.pdf

For traps and counters survey (recruits and silver eel): Each migration control station has its own protocol for counting the number of individuals. The station managers have drawn up explanation sheets which will be made available on the new version of the ponapomi website at the end of 2022-beginning of 2023

For yellow and silver eel biometry: https://hal.archives-ouvertes.fr/hal-03263143/

Compliance to international recommendations: N

Sampling implementation

Recording of refusal rate: NA (scientific surveys)

Monitoring of sampling progress within the sampling year:
Sampling frame is not adjusted on data collected within the sampling year. Continuous monitoring for trapping, depends on the biological rhythm and phenology of the species.

Data capture

Means of data capture:

Scientific electrofishing sampling:

- Electrofishing device
- Landing nets
- Buckets
- GPS
- Depending on the data provider the data is entered on a standard paper file or an excel file then entered in the database

Traps and counters:

- Monitoring device (trap, videocounting device, sonar, …)
- Depending on the data provider the data is entered on a standard paper file or an excel file then entered in the database

Biometry:

For glass eel:

- Precision scale to the mg
- agents with experience in determination of elver pigmentary stage or with training.
- a standard excel file to fill in with the measurements

For yellow and silver eel:

- Precision scales to the g
- calipers for eye diameter,
- Ichtyometer (or meter) to the cm
- a standard excel file to fill in with the measurements

Data capture documentation:
For glass eel: The protocol (Bardonnet A., Coste-Heinricj P. & Bolliet V., 2020, internal report) can be transmitted on request
For yellow and silver eel: https://hal.archives-ouvertes.fr/hal-03263143/

Quality checks documentation:
No, a documentation will be available in 2024

Data storage

National database:

- National postgreSQL databases for the electrofishing data: RSA/ASPE (not openaccess databases)
- National postgreSQL databases for the traps and counters data: STACOMI (not openaccess databases)

International database: NA

Quality checks and data validation documentation:
Referential tables have been created and foreign keys linked to these tables have been created to avoid inconsistent data entry.

Sample storage

Storage description: NA

Sample analysis: NA

Data processing

Evaluation of data accuracy (bias and precision): Y
For electrofishing data: http://www.eptb-vilaine.fr/_doc/MIG/Briand_et_al_2018_Eel_density_analysis_eda2.2.1.pdf

For traps and counters data: https://www.rdocumentation.org/packages/stacomiR/versions/0.5.4.3

Editing and imputation methods: Y
For electrofishing data: http://www.eptb-vilaine.fr/_doc/MIG/Briand_et_al_2018_Eel_density_analysis_eda2.2.1.pdf

For traps and counters data: https://www.rdocumentation.org/packages/stacomiR/versions/0.5.4.3

Quality document associated to a dataset: N

Validation of the final dataset: N because the data is not currently requested by end user
Quality checks before the data integration are made and a scientific group validate the data before providing to end-user.

Diadromous (commercial) – Eel mandatory report CESMIA

MS : France

Region: All regions

Sampling scheme identifier: eel mandatory report CESMIA

Sampling scheme type: Diadromous (commercial)

Observation type: Self water body

Time period of validity: 2022-2024

Short description (max 100 words):
Monitoring scheme aiming at collecting gear catches data (weight and/or number) from freshwater for glass (w.), yellow (w. / n.) and silver (w. / n.) eel. The scheme which collects mandatory reports covers all the regions where gear fishery takes place (river public and transferred domain).

Description of the population

Population targeted:
For all stages of eel: recreational and commercial fishermen by EMU in freshwater during fishing season.

Population sampled:
For glass eel: all commercial fishermen in the EMU: Adour, Garonne – Dordogne - Charente-Seudre, Loire – Côtiers vendéens in freshwater. Glass eel fishing is not allowed in the EMU Rhône Méditerranée Corse for commercial fishermen and in all EMU for recreational fishermen
For silver eel: all commercial fishermen in the EMU: Loire – Côtiers vendéens, Rhône Méditerranée in freshwater. Silver eel fishing is not allowed in the other EMU for commercial fishermen and in all EMU for recreational fishermen.
For yellow eel: all commercial and recreational fishermen where the practice is allowed. A priori in all EMU but the allotment commissions have not taken place yet.

Stratification:
Not relevant. Reporting gear catches data (weight and/or number) from freshwater is mandatory where fishery is allowed.

Sampling design and protocols

Sampling design description:

Not relevant. Reporting gear catches data (weight and/or number) from freshwater is mandatory where fishery is allowed. All catches data reported are collected.

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

Regional coordination: No regional coordination.

Link to sampling design documentation:
https://professionnels.ofb.fr/fr/node/356

Compliance to international recommendations:

N

Link to sampling protocol documentation:
https://professionnels.ofb.fr/fr/node/356

Compliance to international recommendations:.
N

Sampling implementation

Recording of refusal rate: NA – mandatory reports.

Monitoring of sampling progress within the sampling year:
With the implementation of the remote reporting, the management services can more precisely adjust their reaction in case of non-declaration in time since they will have easy access to the data via the web application Cesmia.

Data capture

Means of data capture:
For all eel stages, remote reporting is mandatory for professional fishermen. They registered their catches in Cesmia.
For recreational fishermen, reporting take place via standard paper forms (or remote reporting if they feel able). Forms are mailed and data are registered in Cesmia.

Data capture documentation:
https://ponapomi.afbiodiversite.fr/
https://professionnels.ofb.fr/fr/node/356

Quality checks documentation:
No documentation available yet, a documentation will be available in 2022

Data storage

National database:
Two work environments exist:

- "Cesmia Production": it's the reporting environment, data are not anonymised and a collecting year is kept five years. Authorized users are: fishermen, management services, environmental inspectors, data administrators, entry operators. Different profiles have different rights. This is an online environment; the web site is only accessible via login and password.
- "Cesmia Decisionnel": it's the data-analysis environment, data are anonymised. Authorized users are referenced: data analysts and data administrators.

The data gestion is RGPD compatible.

International database:
NA

Quality checks and data validation documentation:

Referential tables have been created and foreign keys linked to these tables have been created to avoid inconsistent data entry
Data processing
Evaluation of data accuracy (bias and precision): NA. Mandatory reports, thus all catches should be reported through this plateform. **Editing and imputation methods:** NA. Mandatory reports, thus all catches should be reported through this plateform. **Quality document associated to a dataset:** No quality document available. **Validation of the final dataset:** For the moment, done by hand by the database administrator who is also a qualified person.

ANNEX 1.2 - QUALITY REPORT FOR SOCIOECONOMIC DATA SAMPLING SCHEME

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.

Annual fishing activity calendar census survey

Survey Specifications
Annual fishing activity calendar census survey
Sector name(s): Fishing activity variables and Fleet segmentation
Sampling scheme: Census survey
Variables: • **Fishing activity variables** *(Marine waters: Capacity, Effort and Landings) (Table 6).* • **Fleet economic variables** *(Income, Employment, Fleet, Effort) (Table 7).* • **Fleet segmentation** *(Table 8).*
Supra region(s): All supra regions
Survey planning
Annual fishing activity calendar survey **covers the whole of the reference population** in all the supra-regions where French vessels operated *(French fishing fleet register' vessels (FPC) including overseas fisheries, small-scale coastal fleets also vessels not covered by available control regulation declarative data).*
Survey design and strategy

Annual fishing activity calendar survey is conducted by fishing observers *(observers' network of the Ifremer Fisheries Information System)* yearly in France on the basis of preliminary documentation provided by available control regulation declarative data *(fleet register, logbooks, monthly declarative forms, sales note data, geolocalisation data)* and take place every year in the first month of the year on the previous year. Face to face interviews are conducted with fishermen to fill a detailed monthly fishing activity calendar (see Annex 1 - *https://www.ices.dk/sites/pub/CM%20Doccuments/CM-2008/K/K1208.pdf).* No sample size applies as the survey covers the whole reference population. It is particularly instructive for the small-scale coastal fisheries, where catches and effort data are often incomplete. It aims at characterizing each year the inactivity or activity of all the vessels each month of the year and, in the latter case, the metiers practiced *(metier is defined as the use of a gear to target one or several species)* and the main fishing areas with the corresponding range of operation *(distance to the coast of the fishing operation)*. In addition, fishing activity calendar identified each month the main port of exploitation, the number of fishermen on board and the number of days at sea and fishing days. The aim of collecting data about the activity of each vessel is to have a minimum but exhaustive information on the vessels, to have a complete picture of the whole fleet in terms of gears used and fishing activity, at least at a monthly scale.

Estimation design

NA. Census survey. The whole of the reference population is covered by the survey. For fishermen refusing to answer face to face interviews or not available, their annual fishing activity calendar survey is completed by indirect surveys (to fisheries regional committees, producers' or fishermen' organization and/or fishermen from the same area or landings site). Fishing observers' expert knowledge and analysis of their preliminary documentation provided by available control regulation declarative data are also used. In the end annual fishing activity calendar survey are provided for all the vessels of the reference population.

Error checks

Quality procedures are applied continuously on the fishing activity calendar surveys to detect potential errors by cross checking the data surveyed with all the other available fishing data and with expert' knowledges especially of the fishing observers FIS networks involved in the fishing activity calendars data collection.

Data storage and documentation

Data is stored in the Ifremer data base Harmonie.

Detailed information about the survey could be found in the following document:
ICES CM 2008/K:12 "From fleet census to sampling schemes: an original collection of data on fishing activity for the assessment of the French fisheries." - Patrick BERTHOU, Olivier GUYADER, Emilie LEBLOND, Sébastien DEMANECHE, Fabienne DAURES, Claude MERRIEN, Patrick LESPAGNOL - https://www.ices.dk/sites/pub/CM%20Doccuments/CM-2008/K/K1208.pdf.

Information about the survey are also available on the following Ifremer webpage *(in French)*: *https://sih.ifremer.fr/Activite-socio-economie/Activite-des-navires*.

Revision

NA. Census survey.

Confidentiality

Collected data' confidentiality rules are precised in the conventions and protocols. Work performed do not allow to identify directly or indirectly natural or legal persons. Consequently no individual or nominative estimates are calculated by Ifremer. Only anonymised and aggregated data *(concentrating more than 3 fishing enterprises)* are calculated and published by Ifremer.

Complementary on-site sampling of fishing trips (ObsDEB, catch assessment survey)

Survey Specifications
Complementary on-site sampling of fishing trips *(ObsDEB, catch assessment survey).*
Sector name(s): Fishing activity variables
Sampling scheme: Random sampling The fishing trips landings observation programme is based on a sampling plan adapted to each monitored region *(Weiss et al., 2018)* and based on the frame survey *(Annual fishing activity calendar survey, see above)* useful to optimise the strategy of the spatio-temporal on-site sampling plan. This sampling plan sets out for each observer the schedule of landing sites (group of ports) to be visited and the fleets to be surveyed. The principle of the protocol is as follows: each observer is in charge of a portfolio of ports, which are grouped into observation units. The sampling plan is based on a random selection of "days × observation units", emphasising the sampling effort in the most active and diversified observation units. This is thus a **cluster weighted sampling of the fishing trips of the vessels**, where each observer monitors all trip returns of the day for the selected observation unit. The ObsDEB protocol elaborated for each monitoring region/fleet define the number of observers and the number of on-site observations per observer and week to apply with the aim to cover at least about 5% of the total fishing activity of the fleets covered *(e.g. 4 fishing observers are allocated to monitor the fishing fleet less than 12m operating in Guadeloupe with an objective of 4 on-site observation per observer and week)*. It aims also to cover at best and regarding the aimed estimates accuracies, the variability of catches and fishing effort between "metiers", "fishing areas" or "seasonality" by optimising the expendable sampling effort. In order to optimise the accuracy of the ObsDEB estimates, a random stratified *(vessels are stratified into fleets)* telephone survey is also conducted in parallel *(when it is appropriate, i.e. in Martinique and Guadeloupe)* aimed at estimating the fishing activity calendar at a finer scale. During these telephone interviews, only the metiers practised and the number of days at sea during the last week are collected. This allows a better allocation of sampling effort and a better allocation of fishing vessels in the strata. In Guadeloupe, exhaustive fuel consumption per vessel is also used to consolidate total fishing effort estimation.
Variables: • **Fishing activity variables** *(Marine waters: Capacity, Effort and Landings) (Table 6).* • **Fleet economic variables** *(Income, Employment, Fleet, Effort) (Table 7).*
Supra region(s): Other regions *(Outermost regions)*
Survey planning
The sampling scheme applies to the **French fishing small scale coastal fishing fleet** (i.e. fishing fleet less than 12 meters length) **operating in the Outermost regions (French Guiana, Guadeloupe and Martinique, La Réunion and Mayotte)** for which the coverage and precision of their available control regulation declarative data is evaluated as insufficient/incomplete to meet the end-users data needs (e.g.

DCF requirements) and are judged insufficient and unreliable to estimate their fishing activity data.

Survey design and strategy

Complementary on-site sampling of fishing trips is conducted by fishing observers *(observers' network of the Ifremer Fisheries Information System in the Outermost regions)* throughout the year following the sampling scheme described above. For each fishing trip sampled directly on-site *(when the fishers come back to the harbour)*, the observer reconstructs with the fishers through face to face interview the course of the trip *(fishing effort, gear used and fishing ground location, landings by species and associated costs)*, and the number of fishing trips per gear/metier for the past week *(weekly activity calendar to estimate fishing effort i.e. number of fishing trips operating during the year by metier)*. The monitoring of the statistical protocol applied guarantees the statistical representativeness of the samples of fishing trips obtained and allow the statistical theory of sampling to be applied to the calculation of effort and landings estimators and their associated accuracies. The sampling rate aims to cover 5% *(in order to guarantee the calculation of confidence interval estimates with an acceptable sampling error)* of all the fishing trips of the fleets monitored with the exception of the fleets operating in French Guiana *(regarding their specificities)* where the protocol is slightly different and globally almost 50% of the fishing trips are surveyed.

Comparison with the few control regulation declarative data *(i.e. logbooks and coastal logbooks)* are regularly done and the long time series available now for all the fleets monitored allow to detect in good time eventual fishing observers deviation in the data collection and to rectify it as soon as possible.

Estimation design

Complementary on-site samples of fishing trips are then used to estimate the fishing activity variables estimates of the vessels surveyed *(total estimates of weight and value of landings by species and fishing effort (number of trips, days at sea, fishing days and hours at sea), fishing area, metier)*. The raising method is based on the statistical theory and a post-stratification of the fishing trips and weekly calendar sampled by group of metier. Percentile bootstrap methodology is used to calculate the associated estimates accuracies. McCarthy and Snowden method is applied to define the size of the bootstrap samples in order to take into account the "finite population correction".

Error checks

Quality procedures are applied continuously on the fishing trips samples available to detect potential errors by cross checking the data surveyed with all the other available fishing data and with expert' knowledges especially of the fishing observers FIS networks involved in the on-site sampling of fishing trips data collection.

Data storage and documentation

Data is stored in the Ifremer data base Harmonie.

Detailed information about the survey could be found in the following document:
Demanèche, S., Berthou, P., Blanchard, F., Cornou, A.S., Daures, F., Deporte, N., Guyader, O., Lespagnol, P., Reynal, L. 2013. Methodological issues to estimate catches and fishing effort of small-scale fisheries by sampling fishing trips on-site. Proceedings of the 7th International Fisheries Observer & Monitoring Conference, 8-12 April 2013, Viña del Mar, Chile (p°60–62). https://ifomcvigo.com/wp-content/uploads/2017/03/7th-ifomc-proceedings-vina-del-mar.pdf

Information about the survey are also available on the following Ifremer webpage *(in French)*:

https://sih.ifremer.fr/Debarquements-effort-de-peche/Obsdeb.

The last public report about the fishing activity estimates calculated could be found in the following document *(more recent year of the document could be provided on demand)*:
Weiss, J., Demanèche, S., Evano , H., Guyader, O., Bourjea, J., Derridj, O., Reynal, L., Mansuy, E., Berthou, P., Leonardi, S., Rostiaux, E., Leblond, E., Leblond, S. 2018a. Synthèse 2017 de l'observation des efforts et débarquements des pêcheries côtières. Estimation des efforts de pêche et des productions dans les régions Méditerranée continentale, La Réunion, Martinique, Guadeloupe et Guyane pour les navires de moins de 12m. Rapport annuel Convention socle halieutique DPMA-Ifremer 2018. https://archimer.ifremer.fr/doc/00478/58970/.

Finally the full details of the sampling scheme and the calculation used for the estimates are given in Weiss et al. (2018b). Weiss, J., Demanèche, S., Guyader, O. 2018b. Méthodologie de collecte de données et d'estimation des efforts et débarquements des pêcheries côtières. Rapport SIH-Ifremer 2018. https://archimer.ifremer.fr/doc/00471/58281/73227.pdf

Revision

Sampling and estimation strategy are continuously improved taking into account the feedbacks of the fishing observers and the evolution of the fishing practices of the vessels surveyed.

Furthermore, the coverage and precision of the available control regulation declarative data (i.e. logbooks and coastal logbooks) of these fleets is regularly analysed and during the scope of the present working plan it is planned to better integrate this auxiliary information for the calculation of the fishing activity data estimates. Furthermore, for some fleets well covered by control regulation declarative data *(it is the case for example for the less than 12 meters longline fleet operating in La Réunion)* ; alternative methodology could be applied, during the period in which the present working plan will be applied, if they are judged sufficient and reliable to estimate the transversal variables. In this case, they could be eventually re-evaluated on the basis of the exhaustive activity calendar survey *(see above methodology currently applied for less than 12 meters vessels operating in Mediterranean)*.

Confidentiality

Collected data' confidentiality rules are precised in the conventions and protocols. Work performed do not allow to identify directly or indirectly natural or legal persons. Consequently no individual or nominative estimates are calculated by Ifremer. Only anonymised and aggregated data *(concentrating more than 3 fishing enterprises)* are calculated and published by Ifremer.

Tropical tuna fishing activity survey

Survey Specifications
Tropical tuna fishing activity survey
Sector name(s): Fishing activity variables and Fleet segmentation
Sampling scheme: Census survey
Variables: • **Fishing activity variables** *(Marine waters: Capacity, Effort and Landings) (Table 6).* • **Fleet economic variables** *(Fleet, Effort) (Table 7).* • **Fleet segmentation** *(Table 8)* o *Using 'active' gears – Purse seiners* o *Using 'passive' gears - Vessels using hooks.*
Supra region(s): Other regions • Indian Ocean (FAO area 51 and 57) • Atlantic Ocean and adjacent seas (FAO areas 21, 27, 31, 37, 41, 47, 34, 48)
Survey planning
Tropical tuna fishing activity survey covers **the whole reference population** for the targeted segments (purse seiners and vessels using hooks) in all the ICCAT and IOTC regions where French vessels operated. This survey is conducted yearly, and all vessels is the specified segments and regions are interviewed.
Survey design and strategy
Tropical tuna fishing activity survey is conducted based on documentation provided by available control regulation declarative data *(fleet register, logbooks, geolocalisation data)* and takes place throughout the year. It aims at characterizing each year the inactivity or activity of all the vessels targeting tropical tuna. They are no interviews of vessel owner, we analyse the data with a cross cheking of logbooks and VMS. The aim of collecting data about the activity of each vessel is to have the exhaustive information on the vessels, even if they are landing in the harbour which are not in the sampling scheme of the large pelagic sizes on foreign shores (Senegal, Ivory Coast and Seychelles – see Annex 1.1). In addition, fishing activity calendar identified the port of exploitation, the number of days at sea, the number of fishing days and the number of FAD deployed.
Estimation design
NA. Census survey. The vessels monitored are over 40m long and are equipped with ERS and VMS, so we have all the data available for monitoring activities.
Error checks
Quality procedures are applied continuously on the **tropical tuna fishing activity survey** to detect potential errors by cross checking the data with all the other available fishing data and with expert' knowledges.
Data storage and documentation

Data is stored in the IRD information system.
Revision
NA. Census survey.
Confidentiality
Documented data and programs are stored on secure IRD servers. The data is anonymized, and aggregated if needed, to ensure confidentiality when it's delivered to an external user. Data are available to partners who request it, via a data form which is analysed by expert' and processed to ensure the confidentiality.

Socio-economic data on fisheries from logbooks, sales notes, VMS and administrative documents

Survey specifications

Socio-economic data on fisheries from logbooks, sales notes, VMS and administrative documents

Sector name(s): socio economic data on fisheries

Sampling scheme: census

Variables :

- Days at sea
- Employment by age
- Employment by employment status
- Employment by gender
- Employment by level of education
- Employment by nationality
- FTE by gender
- Full-time Equivalent (FTE)
- Gross value of landings
- Mean age of vessels
- Mean LOA of vessels
- Number of fishing enterprises/units
- Number of vessels
- Total hours worked per year (optional)
- Total vessel's power
- Total vessel's tonnage
- Subsidies on investments
- Paid labour

Supra region(s): All supra regions

Survey planning

Fleet register, Logbooks, Sales notes data, VMS data and Administrative documents provide these variables for all supra regions and all vessels.

Moreover, for the following segments and variables, data collection is also done by census, :

over 40m in the Atlantic (2 segments) and

over 40m tropical purse seiners, which catch tuna in the South Atlantic and the Indian Ocean

and **vessels over 12 meters in Reunion** (12-18 and 18-24m),

For them, these variables are provided directly by companies through data collection via accounting

companies. For the 3 segments over 40m, variables are provided exhaustively at segment level. For over 12m in La Reunion, variables are provided for all vessels exhaustively. Thus, specifically for these segments and variables below, sampling scheme is also considered as census :

- Energy consumption
- Energy costs
- Other income
- Other non-variable costs
- Other variable costs
- Personnel costs
- Repair and maintenance costs
- Total value of assets
- Gross debt
- Operating subsidies

Survey design and strategy

Variables are collected from fleet register, logbooks, sales notes data, VMS data and administrative documents.

Variables are collected by census, so the whole reference population is sampled and no sample size applies.

Estimation design

Raw data are computed directly to provide variable by segment. As data are collected through census, no estimation is required. No derived data. No non-response as variables are collected from mandatory declarative informations. However, if there was non-response (partial), the imputation would be to use the average value over the last 3 years, for each vessel.

Error checks

Quality and error check is performed at different stages : by administrative authority, by IFREMER, and finally by SSP through comparison with variables from the previous years.

Data storage and documentation

Data are stored by IFREMER (Harmonie database) and administration in secured server.

No specific methodology applied as raw exhaustive data are directly computed to provide variables at segment level – no documentation available. Variables are calculated following guidelines of JRC datacall : https://datacollection.jrc.ec.europa.eu/guidelines/socioeco/fleet

Revision

Methodology review is performed by JRC.

Confidentiality
Documented data and programs are stored on a secure Department of Agriculture site. Data are available to partners who request it, via the secure data access center created by the French National Institute of Statistics and Economic Studies. The center's teams have designed secure equipment, allowing remote access, while ensuring strong user authentication and file containment.

Socio-economic data on fisheries from economic survey and accounts bookkeeping

Survey specifications

Socio-economic data on fisheries from economic survey and accounts bookkeeping

Sector name(s): socio economic data on fisheries

Sampling scheme: Probability Sample Survey

Variables:

- Energy consumption
- Energy costs
- Other income
- Other non-variable costs
- Other variable costs
- Personnel costs
- Repair and maintenance costs
- Total value of assets
- Gross debt
- Operating subsidies

The following variables cannot be collected due to specificities of French reglementation :

- Unpaid labour / Unpaid labour by gender / Value of unpaid labour : Unpaid labour at sea is illegal in France, even the revenue of one owner alone on his boat is considered a salary, and included in variable "personnel cost". Thus unpaid labour at sea is equal to zero for this segment, and there is not need for sampling.
- Value of quota and other fishing rights/ Income from leasing out quota or other fishing rights/ Lease/rental payments for quota or other fishing rights : fishing rights are not transferable in France.

Supra region(s):

- Baltic Sea; North Sea; Eastern Arctic; NAFO; extended North Western waters (ICES areas 5, 6 and 7) and extended South Western waters (ICES areas 10, 12 and 14)
- Mediterranean Sea and Black Sea

Survey planning

A stratified sampling scheme (STR sampling, 3.6 in the Methodology Handbook) is carried annually out on the two separate populations (vessels registered in the supra regions FAO area 27 (Baltic Sea, North Sea and Eastern Arctic, and North Atlantic) and FAO area 37 (Mediterranean Sea and Black Sea) respectively. The exceptions are the segments over 40 meters operating in area 27 for which no sampling is performed. In that case, exhaustive aggregated data supplied by the companies is provided (see Annex 1.2 for census above).

Strata are given by fleet segments defined according to EU rules. A sampling target (number of vessels to be surveyed) for each fleet segment is computed in two steps. First, a precision target, correlated to turnover, is set for each fleet segment based on an auxiliary variable. Second, Neyman allocations are used to compute optimal sampling targets. A list of target vessels (i.e. vessels to be be surveyed) is then obtained by a random draw within each sampling frame. The data collection approach is based on two complementary sources of information :

- accounts and bookkeeping information
- field survey using a face to face questionnaire for vessels for which accounts and bookkeeping information are not available.

Variables related to capital (Value of physical capital, Consumption of fixed capital) are calculated by the PIM method, for all vessels.

Survey design and strategy

Data sources : Accounts-bookkeeping, field survey and additional sources

The procedure used to collect economic data for fleet segments in France mainland has recently been updated and certified by the National Council for Statistical Information (CNIS) to obtain the status of "Survey of general interest and of statistical quality" for the period 2021-2025[7]. The reference document presenting the framework and procedures is available here[8]. Data collection is supervised by the statistical service of the Ministry of Agriculture (SSP)[9].

The data collection approach is based on two complementary sources of information :

1) Accounts and bookkeeping information
2) Field survey using a face to face questionnaire for vessels for which accounts and bookkeeping information are not available

Economic data collection is carried each year by the following three partners:

- The Laboratoire d'Economie et de Management de l'Université de Nantes (LEMNA) in charge of collecting Accounts and bookkeeping information and also additional data (i.e. data not directly available in the accounts). LEMNA use a network of management and accounting operators located throughout the French coastline to collect these required information.

- PriceWaterhouseCoopers provides exhaustive data for the vessels over 40 m operating in FAO area 27. The information aggregated is based on Accounts and bookkeeping information (see Annex 1.2 on census above).

- The Fisheries Information System and the Marine Economic Unit of IFREMER (Institut Français de Recherche pour l'Exploitation de la Mer) carries out a field survey to collect economic data for vessels for which accounts and bookkeeping information are not available. The field survey is mainly based on face-to-face interviews between data collectors and vessel-company operators. A questionnaire is used to collect economic data at vessel level and additional local information (fuel, gear prices, etc.) is also collected. Other sources available at vessel level for the field survey are: sales notes, log-books or fishing forms, sales notes, administrative information about the registered crew coming from the fishers' social security system. A training system of data collectors is organized each year. (see Spagnol C. et al. for details)[10]

Stratified sampling (STR sampling), described in 3.6 in the Methodology Handbook

Two separate populations are considered: the populations of vessels registered in the supra regions FAO area 27 (Baltic Sea, North Sea and Eastern Arctic, and North Atlantic) and FAO area 37 (Mediterranean Sea and Black Sea) respectively. The population is then stratified according to the length and segment categories required by the EU regulation. The population includes all active vessels that have not changed owner-operator during the course of the year. Sampling target (number of vessels to be surveyed) for each fleet segment is computed in two steps. First, a precision target, correlated to turnover, is set for each fleet segment. Second, Neyman allocations are used to compute optimal sampling targets. The sample size per stratum is determined according to a precision objective (coefficient of 0.1 each year) on an auxiliary variable defined as the product of three variables available for the whole population: vessel length, number of months of activity during the year, the average crew size over the year. A log-log regression was carried out over the historical data and the auxiliary variable called FILEMO was considered as the best estimates to explain vessel turnover (see sampling description[2])

The calculation of optimal allocations by stratum is then carried out using the Neyman allocation program with local constraints. A response rates are introduced per input stratum and differentiated according to vessel length categories, based on the response rates observed in the previous two years. Local constraints were defined as precision targets (CVs) of the FILEMO variable by segment (which are both the segment (which are both the survey and dissemination strata). For the two supra-regions, the constitution of the

sample of vessels is then carried out by systematic random selection. The sampling frame is sorted within each stratum: by maritime district of registration (from North to South of the Channel and Atlantic (Bay of Biscay) coastline, and from west to east for the Mediterranean including Corsica) in order to ensure good geographical coverage, and by length.

Within the identified vessels sample, the vessels with available accounts-bookeeping are first identified, the remaining vessels being allocated to the field survey.

Estimation design

Population estimate from sample and method of calculating derived data

The calculation method for estimating the population data from the sample estimate is margin calibration. It allows to calculate the weight for each segment.

Margin calibration ensures that a number of totals are consistent between the sampling frame and the survey results.

For the economic data on fishing, the auxiliary information contained in the sampling frame is rich (length class of vessels, fishing gear, duration of activity, maritime district). Some data are derived from the combination of these variables: the population segmentation for the European call for data (DCF segment), the turnover proxy (FILEMO) or close to it (segmentation of the fisheries information system close to the fishing gear segmentation).

For some of the data reported by the LEMNA (26 in 2018), the accounting data is consolidated for the company (of 2 or 3 vessels). In this case, the SSP proceeds to a disaggregation using the information of the breakdown of turnover between the various vessels known from the landing data.

Applying a pro rata of this turnover to the other variables gives an estimate for the company's various vessels.

Treatment of nonresponse

Partial non-response

Depending on the collection mode, Accounts-bookkeeping or field survey, the procedures for correcting partial non-response are not the same.

In the case of Accounts-bookkeeping, there is a priori no case of partial non-response and if there is, the LEMNA partner and accounting operators makes it possible to fill in all the accounting variables of accounting nature. For extra-accounting data, there may be vessels for which data are missing (fuel volumes, value of the vessel, etc.). In this case, the vessel data transmitted by the LEMNA to the SSP includes missing values, the SSP performs the processing to estimate these missing values (less and less frequent as the years go by). The estimate is calculated on the basis of the average value of comparable

[7] https://www.cnis.fr/enquetes/production-de-donnees-economiques-secteur-peches-maritimes-enquete/?producer=475

[8] Gitton, F.P., Minne, M.D., Baranger, L., Souffez, A., Guyader, O., Le Grand, C., Merzereaud, M. 2020. Enquête pour la production de données économiques dans le secteur des pêches maritimes 2021-2025 . Dossier de présentation au Comité du label de la statistique publique. Séance du 21 octobre 2020. 288p. https://archimer.ifremer.fr/doc/00694/80622/

[9] https://agreste.agriculture.gouv.fr/agreste-web/statisticons/ORGA-SSP/listeTypeStatisticon/

[10] Spagnol C., Le Grand C., Guyader O. 2021. Construction of economic indicators on commercial fishing in mainland France : data collection.

size (method 5.3.3 in Methodology Handbook)

In the case of field survey-questionnaire carried out through face to face interviews, collected data logically includes some partial non-responses and also potential errors from data collectors. A first step of data qualification and validation is carried out by IFREMER that gives rise to feedback to data collectors in the event of anomalies being detected (data entry errors, outliers, etc.). Data collected are qualified: missing, extreme or outliers are identified by comparing the value for the vessel with: i) reference values of a group of vessels or segment and ii) historical data established for groups of homogeneous vessels. References used may also come from other data sources available at the level of each vessel (e.g. fishing effort and landings data). After checking and potential review of some data (see also error check for more details), partial non-responses are processed by using mainly mean imputation methods (see Le Grand C. et al. for details)[11].

Documentation on this issue is available in Gitton et al. (2020, pp 23-25 and annexes)

Total non-response

The method of treating total non-response used until 2019 (2017 data) was based on the homogeneous response groups (HRGs). Each year, a logistic regression was used to determine the variables to be retained to constitute the HRGs. The processing was carried out separately on the two supra region 27 and 37. The input variables for the logistic regression are: the data collection mode (Accounts-bookkeeping vs flied survey), the fishing gear, the length category, the maritime registration district and the duration of the vessel's activity. After constitution of the GRHs and reweighting to take account of the response probabilities, a calibration on the margin was carried out on the only variable of the segments selected for the European call for data. The partition of the vessel population into segments took into account the maritime frontage, the fishing gear and the length class of the vessels, sometimes aggregated.

After review, it appeared that the calibration following this treatment of non-response was incomplete. It was therefore decided to compare the implementation of this non-response treatment method with a simpler method of calibration on direct margins based on the same variables: fishing gear, length class, maritime district, etc.

Theoretically, it is preferable to do this in the same way as a direct margin calibration method, which is based on the same variables: fishing gear, length class, maritime district, duration of vessel activity and vessel segmentation variable.

From 2020 onwards, it was therefore proposed to use a direct margin calibration as the method for dealing with nonresponse. The data were recalculated for the year 2017 data set and onwards using this method were communicated to the Commission.

In addition to the variables used to correct for total non-response: fishing gear, length class, duration of vessel activity and the vessel segmentation variable (DCF segment), two other variables were taken into account for the calibration on margins:

- the value of landings (by segment) allows better use of auxiliary information correlated with turnover

- the number of vessels according to the segmentation of the fisheries information system, regularly used by regularly used by Ifremer for its work.

[11] Le Grand C., Daurès F., Guyader O., Macher C., Leonardi S., Merzereaud M. 2021. Construction of socio-economic indicators on commercial fishing fleets in mainland France : validation method.

Error checks

The partners of the data collection, respectively the LEMNA and IFREMER have developed ad-hoc procedures to verify the data and avoid errors. The different checking carried out to ensure the quality of the data are the following:

1) Accounts and bookkeeping information

Consistency testing: Working closely with accounting operators allows to work from the same medium, which guarantees the consistency of the initial information and thus avoids the aggregation of disparate information or interpretations of imprecise individual responses that may create a bias in the subsequent use of the data.

- Homogeneity test: A number of enterprises may have atypical values for various reasons. The homogeneity test makes it possible to identify inconsistent indicators, and is the subject of a return visit with the organisations concerned, to provide a qualitative explanation (damage or other exceptional events, specific administrative constraints, etc.).

- Continuity test: Each year, the differences calculated between the observed values and the "theoretical" ones obtained using the previous trends also make it possible to highlight the trends, which can also be used to identify anomalies, in the case of exceeding a predetermined threshold (input costs, insurance reimbursement, etc.)[cf dossier du label, Protocole de collecte/collecte par le LEMNA]

2) Field survey

Data qualification and validation is carried out by IFREMER that gives rise to feedback to data collectors in the event of anomalies being detected (data entry errors, outliers, etc.). Data collected are qualified: missing, extreme or outliers are identified by comparing the value for the vessel with: i) reference values of a group of vessels or segment and ii) historical data established for groups of homogeneous vessels. References used may also come from other data sources available at the level of each vessel (e.g. fishing effort and landings data). A system of pointers traces all the anomalies and corrections made in the database.

Data storage and documentation

The two partners involved in data collection, respectively LEMNA and IFREMER, transmit the collected and validated data per vessel to the SSP via a dedicated ftp server. The SSP is the only service with access to this server. The SSP retrieves the data set and stores them on a dedicated computer server. The SSP makes individual data available to researchers via the Secure Data Access Centre (SDAC) and only disseminates aggregated data in compliance with statistical confidentiality constraints.

Revision

The methodology was changed in 2020 with the margin calibration. It concerns data from 2017 onwards.

The revision of the segmentation has not changed since 2015.

Confidentiality

As mentioned before, the procedure used to collect economic data for fleet segments in France mainland has recently been certified and updated by the National Council for Statistical Information (CNIS) to obtain the status of “Survey of general interest and of statistical quality” for the period 2021-2025.

According to this procedure, confidentiality rules are established for the coordinator, the partners and also data collectors[12]. According to the CNIS rules, the SSP makes individual data available to researchers via the Secure Data Access Centre (SDAC) and only disseminates aggregated data in compliance with statistical confidentiality constraints[13].

Documented data and programs are stored on a secure Department of Agriculture site and available under request.

[12] https://www.insee.fr/fr/information/1300624

[13] The SDAC was created by the French National Institute of Statistics and Economic Studies. The center's teams have designed secure equipment, allowing remote access, while ensuring strong user authentication and file containment.

Socio-economic data from field survey and indirect survey in Outermost regions

Survey specifications

Socio-economic data from field survey and indirect survey in Outermost regions

Sector name(s): socio economic data on fisheries

Sampling scheme: Indirect survey

Variables:

- Energy consumption
- Energy costs
- Other income
- Other non-variable costs
- Other variable costs
- Personnel costs
- Repair and maintenance costs
- Total value of assets
- Gross debt
- Operating subsidies
- Investments in tangible assets (net purchase of assets)
- Consumption of fixed capital
- Value of physical capital

The following variables cannot be estimated properly due to specificity of French reglementation :

- Unpaid labour / Unpaid labour by gender / Value of unpaid labour : Unpaid labour at sea is illegal in France, even the revenue of one owner alone on his boat is considered a salary, and included in variable "personnel cost". Thus unpaid labour at sea is equal to zero for this segment, and there is not need for sampling.
- Value of quota and other fishing rights/ Income from leasing out quota or other fishing rights/ Lease/rental payments for quota or other fishing rights : fishing rights are not transferable in France.

Supra region(s): Other regions

Survey planning

For the Other regions, the distant fleet is distinguished from the fleets of Outermost regions (Saint Martin, Guadeloupe, Martinique and French Guiana for the Atlantic Ocean, Mayotte and La Réunion for the Indian Ocean). Distant fleet variables are collected only through census (see above Annex 1.2 – census).

Outermost regions (ORs): In 2018, 98% of the active vessels operating in the ORs were small scale (under 12 metres LOA). Only the French Guiana, and Reunion fleets have fleet segments between 12 and 24 metres LOA. The OR fleet is distributed in 21 fleet segment. The population under 12 meters is composed of multipurpose artisanal vessels using mainly passive gears and distributed over the coastline of each OR. There are no auction hall and to face the bad quality of fishing forms, adapted schemes have

been established for the monitoring of effort and landings[14] (*see Annex 1.2 on Complementary on-site sampling of fishing trips (ObsDEB, catch assessment survey)).* The activity of the vessels is multipurpose and characterized by a high level of heterogeneity. The socioeconomic context of these regions, the specificities of local fisheries and constraints regarding data availability have led to the development of ad hoc data collection and methodologies to derive economic indicators

French Guiana over 12 metres

The shrimp fishery has been in decline for several years. In 2019, there are 13 Guyanese shrimp trawlers. LEMNA collected bookkeeping data for ten years from a large company based in mainland France and operating vessels in French Guiana. The company sold the vessels, and since then the monitoring has not been carried out. Work is underway to find a reliable local contact.

Reunion mini-longliners (HOK) 9- 12 metres :

The data is currently being analysed to see if it is usable, and a meeting with each ship owner is planned to confirm the data. For other small hooks, bookkeeping is not mandatory in France, data are not available for the moment.

Mayotte (100 vessels less than 8 metres) and St Martin (8 vessels):

For these small fisheries, bookkeeping is not mandatory in France; moreover, landing points are beginning to be set up to improve the quality of biological, effort and landing data. Thus the economic data is difficult to evaluate for the fishermen themselves.

French Guiana, Guadeloupe and Martinique *

Ifremer collects data for vessels **less than 12 metres in French Guiana and Guadeloupe**. *A similar survey will be tested in **Martinique** in 2022. The field survey system used for these two regions is similar to the one developed in mainland France, but with some methodological adaptations due to local specificities and constraints in terms of data availability. Most of the vessels are small-scale vessels operate in an informal way and generally underreport in administrative and fiscal forms. Moreover, most of them are not subject to bookkeeping. The following description applies only to these regions.

Survey design and strategy

Field survey and other data sources (French Guiana, Guadeloupe and Martinique)

Data collection is based on complementary source of information:

- 1) A field survey based on the administration of a questionnaire is scheduled every four years through face-to-face interviews with vessel owners-operators according to a stratified sampling plan and the calculation of sampling allocations by segment. In French Guiana and Guadeloupe, the last survey was carried out in 2020 and detailed in the following report[15] - next survey is planned in 2024.
- 2) Local economic data are collected each year to update information with fishers suppliers about

[14] Ifremer. Système d'Informations Halieutiques (2021). Observation des marées au débarquement (OBSDEB). Principes généraux et protocole. https://w3.ifremer.fr/archimer/doc/00699/81069/85153.pdf

[15] Leonardi, S., Le Grand C. Merzéréaud, M., Bettali, T., Blanchard, F. Mansuy, E. Cisse, A., Guyader, O. 2020. Methodology of collecting socioeconomic data on professional fishing: French Guiana and Guadeloupe: 2020, report Ifremer-RBE-SIH-EM-BIODIVHAL. 18 p; https://archimer.ifremer.fr/doc/00649/76105/86876.pdf

the price of the inputs (fuel, gears, etc.) and more general economic information available at of regional scale (inflation, etc). Other information available each year at vessel level are:

- 3) landings weight-value per gear and days at sea
- 4) administrative information about the registered crew coming from the fishers' social security system.

The questionnaire used in face-to-face interviews is similar to the version used in to France mainland and is available here[16]. To be able to calculate the required indicators, the questionnaire includes a large set of variables) as :

- Marketing Channels and price per species
- Landing cost if any
- Cost per standardized day at sea per metier (gear type) including fuel, ice, bait, etc.
- Gear costs per metier (maintenance and renewable), deck-rigging costs for equipment including moored fishing aggregating devices where relevant.
- Vessel operating costs (maintenance and repair costs, insurances, taxes, etc.)
- Crew size per grade and system of remuneration, social insurance contributions/costs
- Physical and economic evaluation of the initial investment (hull, engines, electronics, safety, other equipments, etc.) and upgrades
- Other information such the implication of the family in the activity, diversification in other activities are also considered.

Training

At the beginning of each field survey, data collectors benefit from dedicated training. Several documents also used including a simplified document presenting the procedure for collecting economic data, a guide for the socio-economic questionnaire, the form used for local data collection. Other available documents are training materials for data collectors, a user guide for the data entry in the dedicated software.

Stratified sampling (STR sampling), 3.6 in Methodology Handbook

As mentioned earlier, the survey is organised through a stratified sampling plan and the calculation of sampling allocations for ad hoc segmentation allowing post-stratification to derive economic variables for EU segmentation[7].

- For Guadeloupe, the segmentation includes the gear used, more detailed length categories (00-06, 06-08, 08-10, 10-12 meters) than in the regulation and the level of effort expressed in days at sea categories (<50, 50-100, >100 days at sea). The objective of this segmentation is to better consider the structure in size of the fleet and the effort variability within the fleet.
- In French Guiana where most of the vessels use the same gear (driftnets), the segmentation includes ad hoc local categories (Canots créole, Canots creoles améliorés, Tapouilles) which are better proxies of investments and turnover than length categories.

However, this approach allows post-stratification to provide the required indicators at EU segment levels.

Calculation of the sampling allocations to each of the strata is then carried out according to a Neymann method. This method allows the adjustment of allocations per stratum according to fixed precision objectives (coefficients of variation of a relevant of a relevant variable of interest, known as the optimisation variable) and optionally an upper bound on the total allocation (i.e. allocation upper bound in other words, a budget constraint). This methodology is implemented in R in the form of a program that

[16] IFREMER (2020). Enquête socio-économique annuelle sur le secteur de la pêche en Outre-Mer. Année de référence 2019 . Questionnaire Économique - N°2020-01 . https://archimer.ifremer.fr/doc/00636/74848/

requires a number of input parameters including :

- N: the number of boats by stratum at the level of the population. Consistent with the preparatory stages, our population is considered as all the vessels included in the survey base.
- MOY: the average by stratum of individual total values taken by the optimisation variable chosen fort each region (the turnover for Guadeloupe, the effort in number of days at sea for French Guiana) for year N-2.
- SH: the standard deviation by stratum of value taken by the optimisation variable for year N-2.
- CONT_LOC: the level of precision (coefficient of variation applied to the optimisation variable) targeted for each stratum. The level of precision set for French Guiana is equal to 15% for all the strata, except the so-called Tapouilles (5%). For Guadeloupe, distinct targets of precision are set according to level of activity of the boats: 33% for those active less than 50 days a year, 10% for those more active.
-

In accordance with the estimated allocations, a systematic random draw is carried out on all the strata, according to:

- i) a gradient running through the ports or group of ports to which vessels
- ii) the numerical sizes of the vessels in ascending order.

This drawing method ensures a homogeneous coverage of the individuals drawn according to these two distribution axes. Once the draw is made, a set of substitutes is associated with each individual drawn. The list of individuals drawn, their respective substitutes and their order of priority are finally listed and communicated to the field survey teams before the collection campaign is launched.

Estimation design

Population estimate from sample and method of calculating derived data

Data collected through the field survey are processed to create reference values for each variable (e.g. cost structures per day at sea and per metier and per segment, repair and maintenance per segment per kW, etc.). After being updated each year with local data, these reference values are applied to each vessel and aggregated at segment level based on the level of effort (days at sea per metier, number or dimension of the gears used) and characteristics of the vessels (age, engine power, etc). Detailed methodology for calculated derived indicators is described in the following report : Le Grand et al. 2021 for a detailed description[17]. Each year, reference values collected through field survey are combined at vessel level and segment level with the other vessel data sets described before including landings in weight-value and effort (days at sea) per metier (gear). Through this combination is derived total revenues, variable and fixed costs, crew costs, indicators about capital per vessel and segment. Revenue and cost structures references are updated each year to take into account the local economic conditions (fuel prices, species landing prices, etc.).

Treatment of nonresponse

Deletion methods are used only when the data collected are of bad quality and not useful for estimation but it is very limited in scope. Partial non-responses (missing values) and values qualified as doubtful or false in the error check are processed by imputation methods either: by using the field survey data (paper survey or entered values) which make it possible to deduce the value, or by deduction of the value using other data sources available at the scale of each vessel (activity, effort and production of each vessel), or by imputation (in general mean imputation) of a reference value calculated at the level of the fleet or segment, or by a historical value assumed to be fixed over time (for example insurance value), coming

[17] Le Grand, C., Merzéréaud, M., Leonardi, S., Guyader, O. 2020. Socioeconomic indicators of professional fishing: French Guiana and Guadeloupe. Methodological Guide, Ifremer Report-RBE-SIH-EM, 24 p

from a previous investigation of the vessel concerned. A system of pointers traces all the corrections made in the database.

Error checks

Data validation and qualification process

During and at the end of the field survey, data collected are reviewed and potential errors are identified by statistical methods (see below) so that data collectors can check potential errors before the end of the survey. Once done, the survey variables are qualified: missing, extreme or outliers are identified by comparing the value for the vessel with: i) reference values of a group of vessels or segment and ii) historical data established for groups of homogeneous vessels.

References used may also come from other data sources available at the level of each vessel (e.g. fishing effort and landings data). Validation routines make it possible in particular to identify potentially outliers as for example: att the scale of a segment Valuen <0.85 * P5 SegmentValue or nValue> 1.15 * P95 SegmentValue, by carrying out cost consistency calculations (Valuen / Revenuen)> x%, or again by checking certain ratios (for example turnover / man / per day at sea). As mentioned before, the identified outliers are returned to data collectors or corrected if necessary (see imputation and treatment of partial non-reponse). Changes in the data are identified and coded for traceability issues. When vessels have many inconsistencies, they are identified and their paper surveys are checked to find elements that explain possible values. The vessel data can then be moved aside the calculation of references by group of vessels used for the processing of partial non-response for certain indicators or completely removed from the sample if it is found to be generally unreliable.

Data storage and documentation

The entry of economic data field survey is carried out by the data collectors on a dedicated software after validation and proofreading of each questionnaire. Once done, data files are sent to a dedicated and secured database (Ifremer Fisheries Information System) to be processed. At the end the survey, the data collectors send all the questionnaire forms to the coordinator of socio-economic data collection and they are obliged to delete the data from their computers. The questionnaires are archived according to the Ifremer archiving protocol, after having been used for central validation.

The methodological documentation is available on the following web site : https://archimer.ifremer.fr/doc/00694/80622/ (Enquête pour la production de données économiques dans le secteur des pêches maritimes 2021-2025)

Revision

As mentioned before, the field survey including the questionnaire is carried out every four years. Local economic data are collected and updated every year as well as other data useful for providing economic indicators. Clustered segments were not changed over the last five years.

Confidentiality

All the data collected as part of this monitoring is declared to the National Commission for Informatics and Liberties - CNIL n ° 1245606.

For service providers collecting data for Ifremer, the survey being labelled, the holder is authorised beforehand by the Statistical Confidentiality Committee to carry out certain stages of processing an economic statistical survey.

The holder undertakes to respect the rules of statistical secrecy as defined by French law n°51-711 of 7 June 1951, as amended, on the obligation, coordination and secrecy of statistics[18]. The holder also undertakes not to divulge any documents, data or information that it may have collected during the surveys, and signs a confidentiality undertaking. The holder keeps the confidentials informations in a secure computer system and once the data has been transmitted, he is contractually obliged to destroy all the confidential informations (including the originals and copies in his possession and in the possession of the persons to whom they have been disclosed)

[18] https://www.legifrance.gouv.fr/loda/id/JORFTEXT000000888573/

Annual aquaculture social and production survey

Survey Specifications

Annual aquaculture social and production survey

Sector name(s): Aquaculture

- **Sampling scheme:** by census

- **Variables:**

Gross sales per species
Weight of sales per species
Paid labour
Unpaid labour
Full-time Equivalent (FTE)
Number of hours worked by employees and unpaid workers
Number of enterprises by size category
Employment by gender
FTE by gender
Unpaid labour by gender
Employment by age
Employment by level of education
Employment by nationality
Employment by employment status

-

Supra region(s): All regions

Survey planning

Population targeted is any company where marine or freshwater aquaculture is part of its business.

Survey design and strategy

- Data source : annual online survey (https://www.cnis.fr/enquetes/aquaculture-enquete-annuelle-2019a075ag/)
- Sample sizes : all companies are surveyed
- Survey methods and distribution :
  - Online survey preferred.
  - Possibility of responding by mail via paper questionnaire.
  - Possibility of responding by telephone (dedicated interviewing team).
  - Follow-up by e-mail, telephone and text message.
- Auxiliary information :
  - Use of business tax data to detect outliers and to estimate non-respondents.
  - Use of enterprise social data to detect outliers and to estimate non-respondents.

Estimation design

-

- Treatment of nonresponse :
    - Imputation of partial non-response (volume entered but not sales amount, or vice-versa) by using the median unit price for the same species and region.
    - Imputation of total non-response:
        - hotdeck method for high-volume production (shellfish, salmonids, etc.): grouping by species, company size and region
        - method of imputation of weighted historical data for low-volume production (weighting based on segment trends)

Error checks

- The main risk is data entry errors in the units. An error detection system is set up based on average prices, historical company data, productivity (volume produced per employee), tax data, etc. The data is corrected directly in the data sets.
- Some corrections are also made on the farming practice. Some practices are impossible in some regions. If the respondent made a mistake in his declaration, the data is corrected: by assigning the breeding practice to the technique declared in previous years or the main technique of the region.

Data storage and documentation

- The data are stored in the statistical tool of the SSP (Ministry of Agriculture) called CERISE (Rstudio Server).
- The technical documentation is also stored in CERISE (Rmarkdown report)

Revision

The Official Statistics Label Committee has given the statistical label for the aquaculture survey for the period 2019-2023. The general methodology may be reviewed in 2024.

Confidentiality

- Statistical confidentiality is defined by Law No. 51-711 of 7 June 1951 on the obligation, coordination and confidentiality of statistics : https://www.legifrance.gouv.fr/loda/id/LEGITEXT000006068104/
- It prohibits the communication of data resulting from processing for statistical purposes, whether they were initially obtained by means of a statistical survey or from databases.
- No result is published if it concerns less than three companies, or if a single company represents 85% or more of its value. In these cases, groupings are made (by region, by species, by breeding practice...)

Annual aquaculture economic survey

Survey Specifications
Annual aquaculture economic survey
Sector name(s): Aquaculture
○ **Sampling scheme:** sample of companies calculated on the basis of annual aquaculture social survey
Variables: Operating subsidies Subsidies on investments Other income Personnel costs Value of unpaid labour Energy costs Raw material: livestock costs Raw material: feed costs Repair and maintenance Other operating costs Consumption of fixed capital Investments in tangible assets (net purchase of assets) Total value of assets Gross debt Financial income Financial expenditures Livestock used Fish Feed used
Supra region(s): All regions
Survey planning
• **Population targeted is** companies that have aquaculture as part of their business (identified in the annual aquaculture social and production survey) and have accounting data certified by accounting management centres. Survey is conducted annually.
Survey design and strategy
▪ Data sources: Certified financial accounts data provided by accounting management centres. ▪ Sample sizes: Sample sizes are determined on the basis of the most recent year's annual aquaculture social and production census survey (see description above). A sampling calculation of 15-20% from the number of enterprises and turnover per strata is calculated and forwarded to the accounting management centres. In return, they send us the accounting data of the enterprises according to the sample. ▪ Survey methods and distribution: The management centres provide us with the accounting data via a file built jointly beforehand. They fill in the accounting data from the latest certified balance sheets for each company.

- Auxiliary information: Application of control formulas on the file received to detect potentially erroneous information. Exchange by e-mail or telephone with the accounting management centres if necessary.

Estimation design

- The accounting data received on the basis of the sample is then extrapolated by indicator by coefficients calculated on the basis of the number of enterprises and the turnover of the annual aquaculture social and production survey.
- A procedural guide contains all method for calculating imputed values. These methods are discussed and approved in a methodological working group between the parties involved in the collection.

Error checks

- The main risk is data entry errors in the units. An error detection system is set up based on average prices, historical company data, and productivity. The data is corrected directly in the datasets.

Data storage and documentation

- Accounting data is stored on a secured server.

Revision

- Every two years, a working group between the Ministry, the University of Nantes and the accounting management centres takes place to see if any changes are needed in the methodology.

Confidentiality

- Statistical confidentiality is defined by Law No. 51-711 of 7 June 1951 on the obligation, coordination and confidentiality of statistics : https://www.legifrance.gouv.fr/loda/id/LEGITEXT000006068104/
- It prohibits the communication of data resulting from processing for statistical purposes, whether they were initially obtained by means of a statistical survey or from databases.
- No result is published if it concerns less than three companies, or if a single company represents 85% or more of its value. In these cases, groupings are made (by region, by species, by breeding practice...)